



**US Army Corps
of Engineers**

Waterways Experiment
Station

Technical Report REMR-CS-57
April 1998

Repair, Evaluation, Maintenance, and Rehabilitation Research Program

Performance Criteria for Concrete Repair Materials, Phase II Laboratory Results

by *Randall W. Poston, Keith E. Kesner*
Whitlock Dalrymple Poston & Associates, Inc.

Peter H. Emmons, Alexander M. Vaysburd
Structural Preservation Systems, Inc.



Approved For Public Release; Distribution Is Unlimited

19980519 004



Prepared for Headquarters, U.S. Army Corps of Engineers

The following two letters used as part of the number designating technical reports of research published under the Repair, Evaluation, Maintenance, and rehabilitation (REMR) Research Program identify the problem area under which the report was prepared:

	<u>Problem Area</u>		<u>Problem Area</u>
CS	Concrete and Steel Structures	EM	Electrical and Mechanical
GT	Geotechnical	EI	Environmental Impacts
HY	Hydraulics	OM	Operations Management
CO	Coastal		

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products.

The findings of this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.



PRINTED ON RECYCLED PAPER

Performance Criteria for Concrete Repair Materials, Phase II Laboratory Results

by **Randall W. Poston, Keith E. Kesner**

**Whitlock Dalrymple Poston & Associates, Inc.
8832 Rixlew Lane
Manassas, VA 20109**

Peter H. Emmons, Alexander M. Vaysburd

**Structural Preservation Systems, Inc.
3761 Commerce Drive
Suite 414
Baltimore, MD 21227**

Final report

Approved for public release; distribution is unlimited

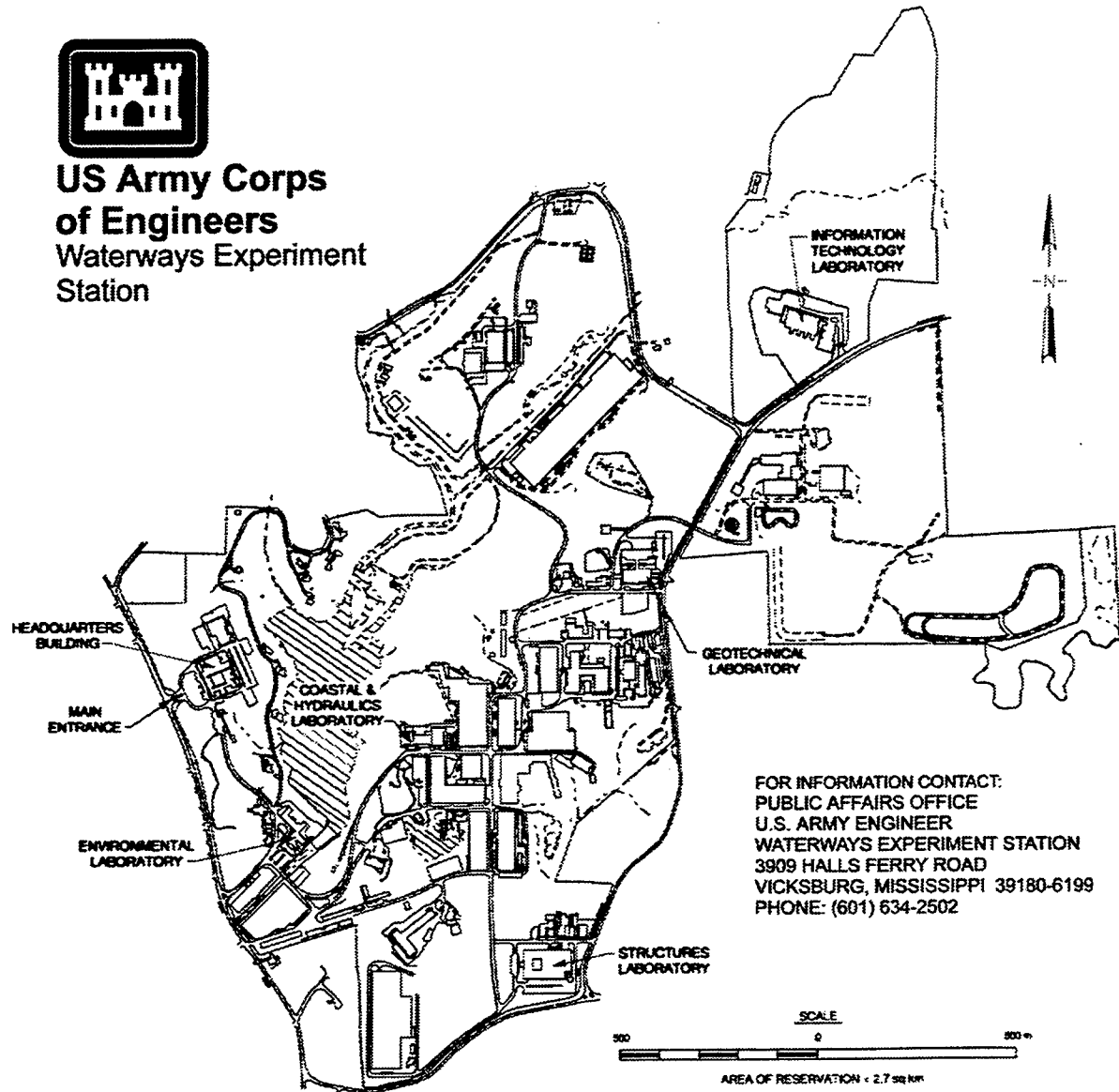
**Prepared for U.S. Army Corps of Engineers
Washington, DC 20314-1000**

Under Work Unit 32637

**Monitored by U.S. Army Engineer Waterways Experiment Station
3909 Halls Ferry Road, Vicksburg, MS 39180-6199**



**US Army Corps
of Engineers**
Waterways Experiment
Station



Waterways Experiment Station Cataloging-in-Publication Data

Performance criteria for concrete repair materials. Phase II, Laboratory results / by Randall W. Poston ... [et al.] ; prepared for U.S. Army Corps of Engineers ; monitored by U.S. Army Engineer Waterways Experiment Station.

299 p. : ill. ; 28 cm. — (Technical report ; REMR-CS-57)

Includes bibliographic references.

1. Concrete — Maintenance and repair. 2. Concrete — Expansion and contraction. 3. Concrete construction — Maintenance and repair. I. Poston, R. W. II. United States. Army. Corps of Engineers. III. U.S. Army Engineer Waterways Experiment Station. IV. Repair, Evaluation, Maintenance, and Rehabilitation Research Program. V. Series: Technical report (U.S. Army Engineer Waterways Experiment Station) ; REMR-CS-57. TA7 W34 no.REMR-CS-57

Contents

Preface	ix
1—Introduction	1
Background	1
Objectives and Scope	3
2—Laboratory Evaluation	5
General	5
Material Selection	5
Mixing Procedures, Mixture Proportions, and Curing	6
Test Methods	8
Compressive strength	8
Modulus of elasticity and Poisson's ratio	8
Flexural strength	9
Compressive creep	9
Coefficient of thermal expansion	11
Drying shrinkage	11
Restrained shrinkage tests	11
Tensile strength	13
Tensile creep	15
3—Test Results	20
General	20
Compressive Strength	20
Flexural Strength	22
Tensile Strength	23
Coefficient of Thermal Expansion	24
Modulus of Elasticity and Poisson's Ratio	25
Drying Shrinkage	26
Ring Test	27
SPS Plate Test	27
German Angle Test	28
Compressive Creep	28
Tensile Creep	50
4—Discussion of Tests Results	67
General	67
Compressive Strength	67
Tensile and Flexural Strength	67

Modulus of Elasticity and Poisson's Ratio	69
Coefficient of Thermal Expansion	69
Unrestrained Shrinkage versus Restrained Shrinkage Test	69
Compressive and Tensile Creep	70
5—Summary and Conclusions	73
Summary	73
Conclusions	73
References	75
SF 298	
Appendix A: Technical Data, Proportioning, Mixing, and Curing Procedures for Materials Evaluated	A1
Appendix B: Compressive Strength Data	B1
Appendix C: Flexural Strength Data (ASTM C 78 (1994b))	C1
Appendix D: Tensile Strength Data	D1
Appendix E: Drying Shrinkage Data (ASTM C 157 (1994d))	E1
Appendix F: Ring Test Data	F1
Appendix G: SPS Plate Test Data	G1
Appendix H: Compressive Creep Data (ASTM C 512 (1994k))	H1
Appendix I: Tensile Creep Data	I1

List of Figures

Figure 1. Phase II field and laboratory research program	4
Figure 2. Compressive creep frames	10
Figure 3. Ring test specimen mold	12
Figure 4. Casting of ring test specimen	13
Figure 5. German angle test specimen	14
Figure 6. Application of bonding agent to German angle prior to casting specimen	14
Figure 7. SPS plate test	15
Figure 8. Tensile strength test	16
Figure 9. Fracture of tensile strength specimen	17
Figure 10. Tensile creep test frame	18
Figure 11. Strain measurement on tensile creep specimens	19
Figure 12. Effect of humidity on drying shrinkage over time for Material No. 1	29

Figure 13.	Effect of humidity on drying shrinkage over time for Material No. 2	29
Figure 14.	Effect of humidity on drying shrinkage over time for Material No. 3	30
Figure 15.	Effect of humidity on drying shrinkage over time for Material No. 4	30
Figure 16.	Effect of humidity on drying shrinkage over time for Material No. 5	31
Figure 17.	Effect of humidity on drying shrinkage over time for Material No. 6	31
Figure 18.	Effect of humidity on drying shrinkage over time for Material No. 7	32
Figure 19.	Effect of humidity on drying shrinkage over time for Material No. 8	32
Figure 20.	Effect of humidity on drying shrinkage over time for Material No. 9	33
Figure 21.	Effect of humidity on drying shrinkage over time for Material No. 10	33
Figure 22.	Effect of humidity on drying shrinkage over time for Material No. 11	34
Figure 23.	Effect of humidity on drying shrinkage over time for Material No. 12	34
Figure 24.	Change in total average crack width with time from ring test for Portland-cement based materials (multiply inches by 25.4 to obtain millimetres)	35
Figure 25.	Change in total average crack width with time from ring test for polymer-modified materials (multiply inches by 25.4 to obtain millimetres)	35
Figure 26.	Tip deflection results from SPS plate test for nonpolymer-modified materials	36
Figure 27.	Tip deflection results from SPS plate test for polymer-modified materials	36
Figure 28.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 1	38
Figure 29.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 2	38
Figure 30.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 3	39
Figure 31.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 4	39
Figure 32.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 5	40

Figure 33.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 6	40
Figure 34.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 7	41
Figure 35.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 8	41
Figure 36.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 9	42
Figure 37.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 10	42
Figure 38.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 11	43
Figure 39.	Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 12	43
Figure 40.	Specific creep strains for Material No. 1 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	44
Figure 41.	Specific creep strains for Material No. 2 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	44
Figure 42.	Specific creep strains for Material No. 3 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	45
Figure 43.	Specific creep strains for Material No. 4 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	45
Figure 44.	Specific creep strains for Material No. 5 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	46
Figure 45.	Specific creep strains for Material No. 6 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	46
Figure 46.	Specific creep strains for Material No. 7 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	47
Figure 47.	Specific creep strains for Material No. 8 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	47
Figure 48.	Specific creep strains for Material No. 9 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	48
Figure 49.	Specific creep strains for Material No. 10 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	48
Figure 50.	Specific creep strains for Material No. 11 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	49
Figure 51.	Specific creep strains for Material No. 12 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)	49
Figure 52.	Results of tensile creep measurements, Material No. 1	51
Figure 53.	Results of tensile creep measurements, Material No. 2	51
Figure 54.	Results of tensile creep measurements, Material No. 3	52

Figure 55.	Results of tensile creep measurements, Material No. 4	52
Figure 56.	Results of tensile creep measurements, Material No. 5	53
Figure 57.	Results of tensile creep measurements, Material No. 6	53
Figure 58.	Results of tensile creep measurements, Material No. 7	54
Figure 59.	Results of tensile creep measurements, Material No. 8	55
Figure 60.	Results of tensile creep measurements, Material No. 9	56
Figure 61.	Results of tensile creep measurements, Material No. 10	57
Figure 62.	Results of tensile creep measurements, Material No. 11	58
Figure 63.	Results of tensile creep measurements, Material No. 12	59
Figure 64.	Specific tensile creep for Material No. 1 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	60
Figure 65.	Specific tensile creep for Material No. 2 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	61
Figure 66.	Specific tensile creep for Material No. 3 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	61
Figure 67.	Specific tensile creep for Material No. 4 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	62
Figure 68.	Specific tensile creep for Material No. 5 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	62
Figure 69.	Specific tensile creep for Material No. 6 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	63
Figure 70.	Specific tensile creep for Material No. 7 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	63
Figure 71.	Specific tensile creep for Material No. 8 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	64
Figure 72.	Specific tensile creep for Material No. 9 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	64
Figure 73.	Specific tensile creep for Material No. 10 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	65
Figure 74.	Specific tensile creep for Material No. 11 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	65
Figure 75.	Specific tensile creep for Material No. 12 (multiply millionths/psi by 145.0377 to obtain millionths MPa)	66
Figure 76.	Tensile creep frame	71

List of Tables

Table 1.	Material Information	7
Table 2.	Results of Compressive Strength Tests for 76- by 152-mm (3-by 6-in.) Specimens	21
Table 3.	Results of Compressive Strength Tests by 152- by 305-mm (6- by 12-in.) Specimens	22
Table 4.	Compressive Strength Comparison Between 76- by 152-mm (3- by 6-in.) and 152- by 305-mm (6- by 12-in.) Specimens	22
Table 5.	Flexural Strength Test Results	23
Table 6.	Tensile Strength Test Results	24
Table 7.	Coefficient of Thermal Expansion Test Results	25
Table 8.	Modulus of Elasticity and Poisson's Ratio	25
Table 9.	Results of Drying Shrinkage Test	26
Table 10.	Results of Time to First Cracking in Ring Test	28
Table 11.	Compressive Creep Test Results Summary	37
Table 12.	Tensile Creep Test Results Summary	66
Table 13.	Material Performance Summary	68
Table 14.	Comparison of Ring Test and SPS Plate Test Results	70
Table 15.	Ratio of Tensile to Compressive Specific Creep	72

Preface

The study reported herein was authorized by Headquarters, U.S. Army Corps of Engineers (HQUSACE), under Civil Works Research Unit 32637, "Evaluation of Existing Repair Materials and Methods," for which Mr. James E. McDonald, Structures Laboratory (SL), U.S. Army Engineer Waterways Experiment Station (WES), is the Principal Investigator. This work unit is part of the Concrete and Steel Structures Problem Area of the Repair, Evaluation, Maintenance, and Rehabilitation (REMR) Research Program.

The REMR Technical Monitor is Mr. M. K. Lee, HQUSACE. Dr. Tony C. Liu (CERD-C) is the REMR Coordinator, Directorate of Research and Development, HQUSACE. Mr. Harold C. Tohlen (CECW-O) and Dr. Liu serve as the REMR Overview Committee. Mr. William F. McCleese, WES, is the REMR Program Manager. Mr. McDonald is the Problem Area Leader for Concrete and Steel Structures.

The study was performed by Whitlock Dalrymple Poston & Associates, Inc. (WDP), Manassas, VA, under subcontract to Structural Preservation Systems, Inc., Baltimore, MD, under contract to WES. The study was under the direct supervision of Mr. McDonald and the general supervision of Dr. Paul F. Mlakar, Chief, Concrete and Materials Division, and Dr. Bryant Mather, Director, SL.

The authors acknowledge the assistance of Messrs. J. Eric Peterson, Christopher Galitz, and Scott Walkowicz, WDP, in the conduct of the research study.

At the time of publication of this report, Director of WES was Dr. Robert W. Whalin. Commander was COL Robin R. Cababa, EN.

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products.

1 Introduction

Background

Concrete repair durability depends, to a large degree, on the appropriate choice and application of repair materials. Restrained contraction of repair materials, the restraint being provided through bond to the existing concrete substrate, is a major factor. This aspect of restraint significantly increases the complexity of repair projects as compared to new construction.

Selecting repair materials requires a thorough understanding of material behavior in anticipated service and exposure conditions. One of the greatest challenges facing successful performance of repair materials is their relative dimensional behavior to the substrate. Relative dimensional changes cause internal stresses within the repair material and the substrate. Particular attention is required to minimize these stresses and to select materials that properly address relative dimensional behavior. Finding materials that behave similarly under all conditions as the substrate when subjected to loads, temperature, and moisture change is improbable. The requirement for successful and durable repairs is that selected repair materials must have properties with a reasonable degree of dimensional compatibility with the substrate.

Traditionally, the selection of materials has been based on data supplied from the manufacturers who have provided test results for properties considered the most relevant. This information from manufacturers generally includes compressive strength. The manufacturers' data sheets provide little or no information about the behavior and dimensional stability of the materials in repair applications. At best, the manufacturers' data may include results from American Society for Testing and Materials (ASTM) C 157, "Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete" (ASTM 1994d) which has arbitrarily been modified. These concrete repair material data are very often inadequate in key areas such as tensile strength, elastic modulus, shrinkage under realistic environmental conditions, and the long-term creep of repair materials.

To specify a material for a repair application is not as simple as it may seem. Depending on the type of structure, the amount of deterioration present, its location within the structure and other various factors, the material selection coupled to the preferred placement methods must be selected. Some materials

work well as hand applied, while others work better as forms and pour, forms and pump, or shot applied. Emmons (1993) presents a good summary of these various types of repair techniques for concrete.

While the economics and difficulties of carrying out repairs provide a strong argument for researching the performance of repair systems, there are some difficulties that may be attributed to the following factors: (a) each of the broad categories of repair materials has a wide variation of properties within it so that there are no representative materials; (b) realistic performance testing requires representative repairs to be exposed to a real world environment for realistic durations; and (c) repair materials are continuously under development - by the time studies have been completed, materials have already been changed.

To this end, it was recognized that research on a few reasonably representative repair materials would provide valuable basic information on the parameters controlling concrete repair material behavior and, specifically, durability. It would also provide benchmark behavior against which the properties of more recently developed materials and materials developed in the future could be judged. It is within this context that the present study was proposed.

With the variety of ways now possible to achieve a given level of performance, there is considerable pressure within the industry to develop and use performance criteria. Unfortunately, development of such criteria has not kept pace with the development of materials, primarily because of the lack of appropriate scientific and field data needed for its development. Development and adherence to sound performance criteria can be an avenue to improve repair construction. Introduction of performance criteria will require improved understanding of the relationships between the composition, microstructure, and physical performance of cement-based composites. Dimensional compatibility between a repair and an existing structure is a hallmark of such criteria.

To specify the appropriate material and to evaluate performance of products is virtually impossible at this time due to the variety of methods which measure the shrinkage of materials. In addition to the absence of a reliable industry-wide testing method, manufacturers who are using the same standard method are arbitrarily modifying the method. The arbitrary application of test methods has resulted in controversy and confusion in selecting and specifying materials.

Structural Preservation Systems, Inc. (SPS), Baltimore, MD, was awarded a research study by the U.S. Army Engineer Waterways Experiment Station (WES) to develop performance criteria and guide specifications in a format suitable for use by the Corps of Engineers and others for dimensional compatible repair materials. As part of the Phase I activities, a comprehensive experimental field and laboratory evaluation program for the proposed Phase II study was developed. It was proposed that the field evaluation program would consist of restrained shrinkage slabs placed in field sites subjected to differing environmental exposure. A parallel laboratory study consisting of existing standards and other testing methods proposed in Phase I to run concurrently

with the field evaluation was also identified. With this as background, this report summarizes the laboratory evaluation conducted as part of the Phase II program.

Objectives and Scope

The objective of the laboratory investigation of the Phase II program was to evaluate the performance of certain selected, commercially available concrete repair materials. Figure 1 shows the Phase II laboratory testing in context with the overall Phase II program.

For purposes of the Phase II program, 12 candidate materials were selected for study. Each of the materials was subjected to a series of standard and nonstandard laboratory tests to determine material properties which were perceived to be of interest in a repair context and to provide some basic information about their behavior. These proposed nonstandard tests were conducted based on generalized testing concepts generically identified during the Phase I investigation (Emmons and Vaysburd 1995). This evaluation was conducted to target an understanding of material properties, especially those related to restrained shrinkage, which had been identified as likely affecting performance and durability of concrete repairs. The principal objective of the laboratory and field evaluation program coupled together was the identification of performance criteria that would lead to cost-effective and durable concrete repairs.

Results of the laboratory evaluation component of the overall Phase II investigation are described in this report.

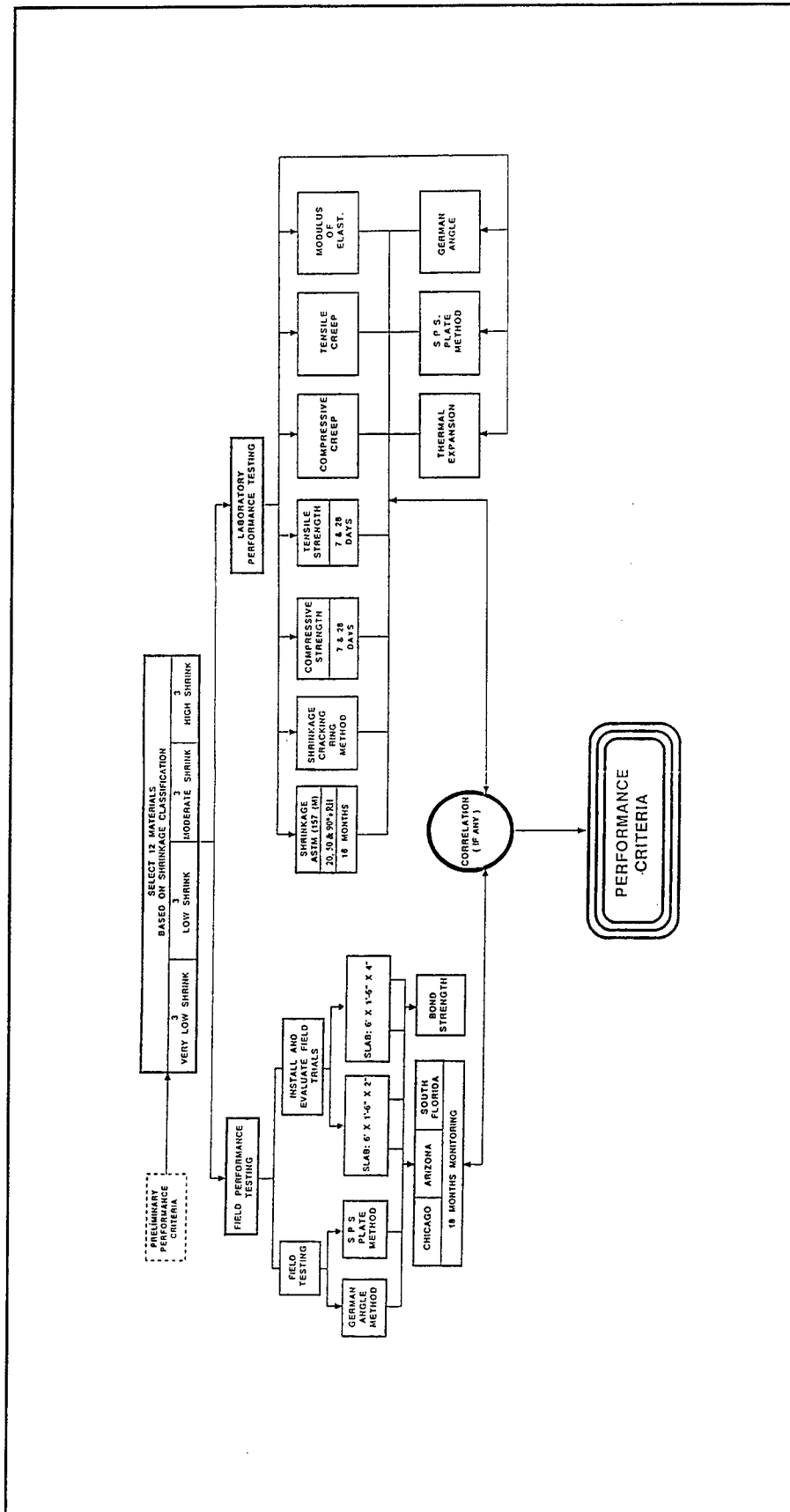


Figure 1. Phase II field and laboratory research program

2 Laboratory Evaluation

General

The laboratory evaluation conducted as a part of the research program consisted of a series of standard and nonstandard tests that had been proposed as a result of the Phase I program. Except where modifications are noted, the standard tests were conducted in accordance with the American Society for Testing and Materials (ASTM) test methods (ASTM 1994). The nonstandard methods were developed based on preliminary performance based criteria identified in the Phase I study (Emmons and Vaysburd 1995). A testing protocol was established for each of these nonstandard tests to ensure consistency in the evaluation of all materials.

The tests that were conducted in the laboratory part of the program included:

- Compressive strength - ASTM C 39 (1994a)
- Modulus of elasticity - ASTM C 469 (1994i)
- Drying shrinkage - ASTM C 157 (modified) (1994d)
- Compressive creep - ASTM C 512 (1994k)
- Coefficient thermal expansion - ASTM C 531 (1994l)
- Flexural strength - ASTM C 78 (1994b)
- Tensile creep - nonstandard test method selected for this project
- Tensile strength - nonstandard test method developed for this project
- Restrained shrinkage - three previously identified nonstandard test methods (Emmons and Vaysburd 1995) developed for this research project including ring test, SPS plate test, and German angle test.

Material Selection

Although conventional ready-mixed concrete can be used for repairs to concrete structures, the nature of deterioration, limited size of many repairs, construction phasing requirements and other factors have led to an industry in which manufacturers prepare prepackaged specialty materials generally in 22.7- to 45.4-kg (50- to 100-lb) units. As already has been discussed, this industry is expanding at such a rapid pace that these materials are in a constant state of evolution. Many are on the market for only a short period of time, while

others keep their trade name for market recognition, but are extensively reformulated. Consequently, a concrete repair material that has seemingly worked well over a period of time, without cause performs poorly in similar applications and under similar environmental exposure. In other cases, the performance of a material may dramatically improve after reformulation. This is one of the principal reasons for establishing performance-based criteria. At this time, there are literally hundreds of prepackaged concrete repair materials on the market.

To this end, for purposes of the present laboratory study, it was desired to mirror a representative cross section of the industry. Accordingly, both conventional Portland cement-based and polymer-modified repair concretes were included.

It was also desired to include a selection of materials representative of the broad range of drying shrinkage data previously reported (Alberta Transportation and Utilities 1987). Moreover, it was desired to select representative materials from various categories of a proposed classification of shrinkage varying from low to high (Emmons, Vaysburd, and McDonald 1993). This broad range would be representative of drying shrinkage varying from approximately 300 to 2,000 millionths at 28 days.

Based on the aforementioned general requirements and a review of available manufacturers technical data, 12 candidate materials were selected for testing in the Phase II program. The materials selected, generic type, and manufacturer are summarized in Table 1. The materials were shipped to Whitlock Dalrymple Poston & Associates, Inc. (WDP) laboratory directly from the manufacturer.

Mixing Procedures, Mixture Proportions, and Curing

The manufacturers' recommended mixture proportions and mixing and curing procedures were followed for each repair material. In the case where a range of mixing water was specified by a manufacturer, the amount at the low end of the range was initially used. Additional water was added within the range as required to obtain a workable mixture. The manufacturer reported technical and application data for proportioning, mixing, and curing is summarized in the tables in Appendix A.

Six (No. 1, 2, 4, 5, 9, and 11) of the twelve materials were portland-cement-based repair materials whereas the other six materials (No. 3, 6, 7, 8, 10, and 12) were polymer-modified repair materials. For those materials prepared as concrete, the coarse aggregate was a 9.5-mm (3/8-in.) nominal maximum size crushed stone.

In some cases, it was necessary to modify the manufacturers' recommendations for mixture proportioning to achieve a workable and placeable mixture. Deviations from the manufacturers' recommendations are

Table 1 Material Information			
Material No.	Repair Material	Generic Type	Manufacturer
1	Patchroc 10-16	Cement mortar (coarse aggregate added)	Fosroc, Inc.
2	Metro 240	Portland-cement concrete	American Stone Mix, Inc.
3	One Shot	Polymer-modified concrete	Conproco Coatings
4	Structural Concrete	Cement concrete (coarse aggregate added)	Five Star Products, Inc.
5	Fas Trak	Cement mortar (coarse aggregate added)	W.R. Grace & Co.
6	Euco SR-93	Polymer-modified mortar (coarse aggregate added)	The Euclid Chemical Co.
7	Conpro-Set	Polymer-modified mortar (coarse aggregate added)	Conproco Coatings
8	DN	Polymer- and fiber-modified mortar	Fosroc, Inc.
9	Control Concrete Mix (Maryland DOT Mix #6)	Portland-cement concrete	Packaged by American Stone Mix, Inc.
10	Emaco R 310	Polymer-modified cement mortar (coarse aggregate added)	Master Builders, Inc.
11	Emaco S66-CR	Cement-based repair concrete	Master Builders, Inc.
12	Sika Top 111 Plus	Polymer-modified portland-cement mortar (coarse aggregate added)	Sika Corp.

noted in the third column of the summary tables in Appendix A along with salient observations noted during the mixing and batching operations in preparation for casting the laboratory specimens.

Curing followed exactly manufacturers' recommendations summarized in the tables in Appendix A where practicable. For example, the creep testing required initial loading at 3 days of age, yet wet curing for 7 days was recommended. In this case, loading occurred at 3 days but the specimens were kept moist with wet burlap through the seventh day. Thus, care was taken to mimic the manufacturers' recommendations for curing if at all practicable. Deviations did occur in the shrinkage testing at different humidity levels since that testing started at 1 day. However, yet it would be impossible to have wet curing and still monitor a 20 percent relative humidity, for example. In this case, the testing protocol precluded following exactly the manufacturers' recommendations.

Three of the materials (No. 3, 9, and 10) had additional comparative testing conducted to gain an understanding of size effects. Specimens of different

sizes, and consequently different volume to surface ratios, were cast for comparative purposes for some of the tests.

Test Methods

Specimen preparation and test procedures are described in this section. Standardized tests were conducted in accordance with prescribed procedures except where otherwise noted. In particular, as has already been discussed, curing followed manufacturers' recommendations versus the generally cited procedure of water curing specimens for most standardized laboratory test methods.

The nonstandard tests that were conducted were those that were identified in the Phase I study as showing promise of establishing cracking potential of a concrete material in a repair application (Emmons and Vaysburd 1995). For these test methods, specimen molds and test frames were constructed specifically for the project. Protocols were written to establish consistency in the evaluation procedure to be able to comparatively evaluate the performance of the 12 selected materials.

Compressive strength

Although compressive strength for the most part is not an important material property in many repair applications since they occur in tension zones of structures, compressive strength has become the singular property always reported for a concrete material.

In the repair industry, 76- by 152-mm (3- by 6-in.) cylinders have become the de facto standard size for determining compressive strength. This is because generally smaller-size aggregate, 9.5 mm (3/8 in.) or less, is used as the coarse fraction. Also, because of the cost of the prepackaged materials, the volume required in 152- by 305-mm (6- by 12-in.) cylinders can make the strength testing expensive.

In general, three 76- by 152-mm (3- by 6-in.) cylinders were tested for each material at 3, 7, and 28 days. Material No. 3, 9, and 10 also had three 152- by 305-mm (6- by 12-in.) cylinders tested at 3, 7, and 28 days to provide some comparative information about size effects. The compressive strength of the specimens was determined in accordance with ASTM C 39-93a (ASTM 1994a).

Modulus of elasticity and Poisson's ratio

Three 76- by 152-mm (3- by 6-in.) cylinders were fabricated for the purposes of measuring the static modulus of elasticity. It was believed that Poisson's ratio would not vary widely. Accordingly, Poisson's ratio was measured only for one polymer-modified material (No. 3) and one

nonpolymer-modified material (No. 9). The specimens were tested at 28 days after the specimens underwent the curing regime as recommended by the manufacturer. Electrical resistance strain gauges were bonded to the specimens approximately 6 hr prior to the test. The static modulus of elasticity and Poisson's ratio were determined in accordance with ASTM C 469-94 (ASTM 1994i).

Flexural strength

Nine 152- by 152- by 533-mm (6- by 6- by 21-in.) beams were cast for each of the 12 materials. Flexural strengths were determined at 3, 7, and 28 days according to ASTM C 78-94 (ASTM 1994b) using three of the beams at each age.

Compressive creep

Six 76- by 152-mm (3- by 6-in.) cylinders were cast for each material for purposes of measuring the creep under compression. Two of the six cylinders remained unloaded (control specimen) over the test period to monitor drying shrinkage. In this way, the drying shrinkage experienced by the specimens under compressive load could be subtracted from the total measured strain to determine creep strain. These control specimens for monitoring drying shrinkage naturally had the same volume to surface ratio as those being monitored for creep.

Mechanical gauge points were bonded to diametric opposite sides of the specimens. In this way, any eccentric effects of the applied load were essentially canceled.

Two of the six specimens for each material were placed in creep frames and loaded to a nominal stress equivalent to 20 percent of the compressive strength at 28 days. The other two specimens were placed in creep frames and loaded to a nominal stress equivalent to 40 percent of the 28-day compressive strength. Material strengths were matched so that pairs of two materials could be placed in the creep frames. In other words, creep was monitored at a given nominal load level for 2 of the 12 materials (two cylinders for each material) in each creep frame. Figure 2 shows a creep frame.

The load was initially applied to the specimens at an age of 3 days. The load applied corresponded to a nominal stress of 20 or 40 percent of the measured compressive strength at 3 days. The load was increased at age 7 days corresponding to the nominal stress level 20 or 40 percent of the 7-day compressive strength. The load was increased once again at age of 28 days to the final nominal stress level of 20 or 40 percent of the 28-day compressive strength. The frames were periodically reloaded to maintain a reasonably constant stress as that applied at 28 days since there is some relaxation in the creep frames with time.



Figure 2. Compressive creep frames

Compressive creep tests were also conducted on sealed specimens for Materials No. 3, 9, and 10. Three days after casting, these cylinders were sealed with a very thin clear epoxy to reduce moisture loss from the specimen. This was done in order to compare creep behavior.

The compressive creep test frames and procedure followed ASTM C 512-94 (ASTM 1994k) except as previously noted.

Coefficient of thermal expansion

The coefficient of thermal expansion was determined according to ASTM C 531-85 (ASTM 1994l) except that the specimen size was 76 by 76 by 286 mm (3 by 3 by 11-1/4 in.). Three specimens were fabricated for each material.

Drying shrinkage

The drying shrinkage was determined for each material under three different environments - 20, 50, and 90 percent relative humidity. Triplicate specimens, 76 by 76 by 286 mm (3 by 3 by 11-1/4 in.), were cast for each material for each exposure to humidity environment. The specimens were demolded at 1 day. The specimens were stored at 2.8 °C (73 °F). The specimens monitored at 20 and 90 percent relative humidity were stored in environmental chambers. The specimens stored in the laboratory were kept at 50 percent relative humidity. Drying shrinkage was monitored over time for about 18 months for each of the beam specimens by measuring the length change according to ASTM C 157-93 (ASTM 1994d).

Restrained shrinkage tests

Three different types of nonstandard tests were conducted to evaluate the restrained shrinkage or cracking potential of the concrete repair material. These are referred to as the ring test, German angle test, and SPS plate test. These tests are summarized in the following sections.

Ring test. The ring-type test was a modification to that described by Shah, Karagular, and Sarigaphuti (1992). Figure 3 shows the mold used for the ring test. As can be seen, the material was cast around a 254-mm- (10-in.-) diameter, 25.4-mm- (1-in.-) thick steel pipe stock. The diameter of the ring specimen was selected to produce a reasonably constant theoretical stress state across the 32-mm (1.25-in.) thickness of the material. The 102-mm (4-in.) height of the ring specimen was chosen to represent the upper bound of thickness found in typical repair applications. Note that epoxy was applied to the top surface of the ring test specimen to reduce moisture loss. The casting of a ring specimen is shown in Figure 4.

The material was allowed to cure in the mold for 24 hr. The material was then cured following the manufacturer's recommendations. The rings were monitored daily under standard laboratory conditions for evidence of cracking. The day that cracking was first observed was recorded. Thereafter, periodically, each of the cracks that had formed was measured for width at three locations along the crack height and recorded.

German angle test. This test had been identified in the Phase I program (Emmons and Vaysburd 1995) as a candidate for restrained shrinkage test. The test consisted of filling a steel angle, with dimensions shown in Figure 5, with the repair material. The angle was initially thoroughly cleaned with a

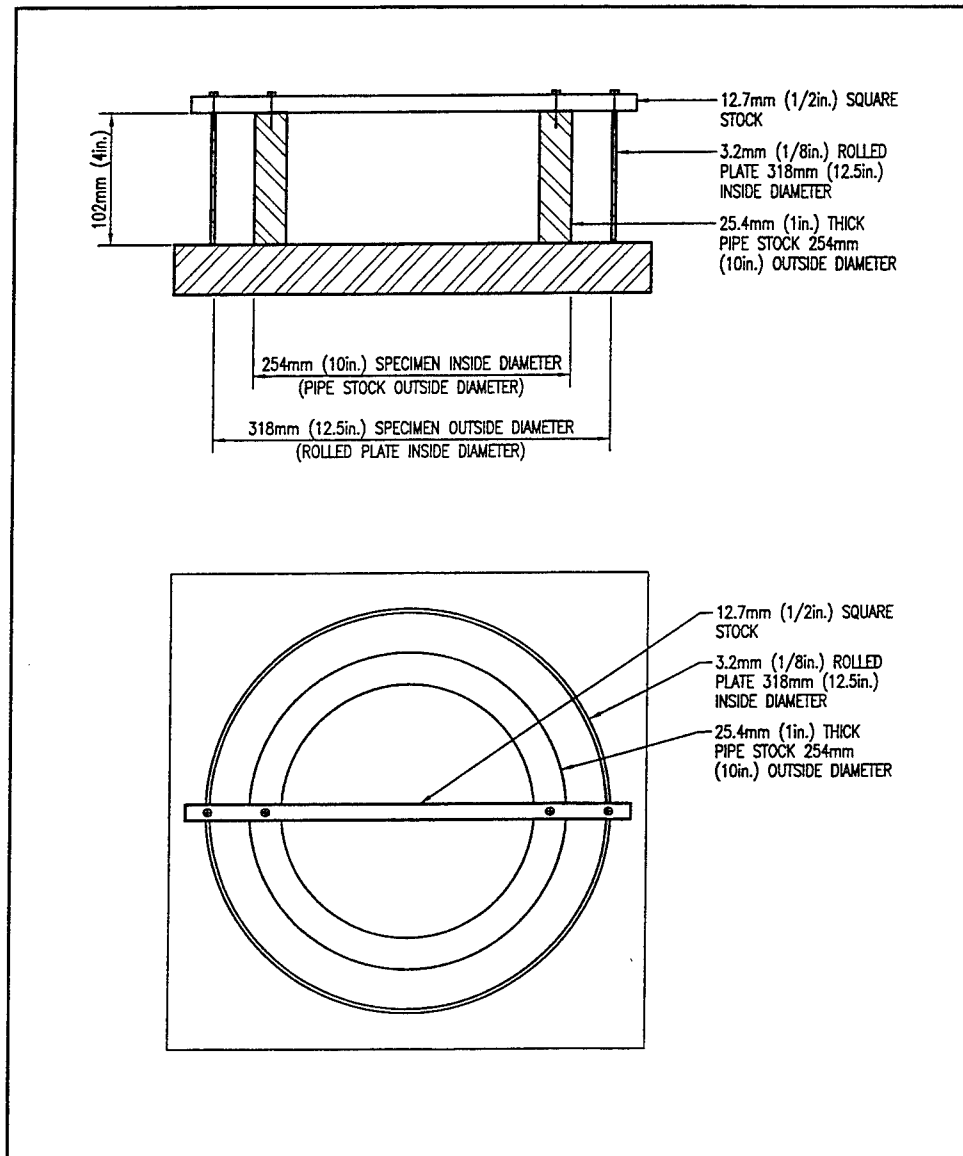


Figure 3. Ring test specimen mold

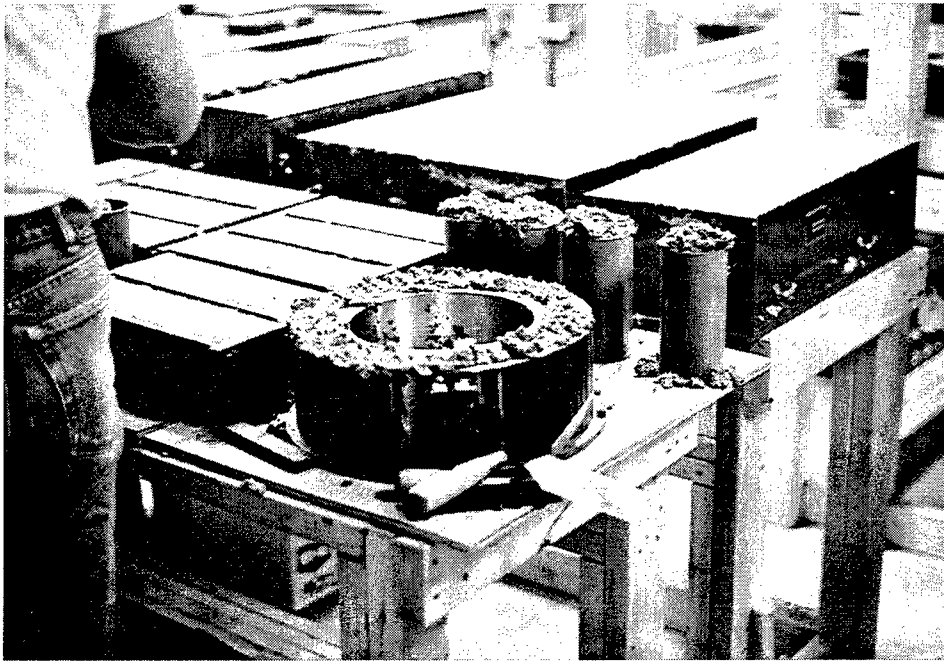


Figure 4. Casting of ring test specimen

degreaser. An epoxy bonding agent was applied to the angle as shown in Figure 6 prior to casting the specimen.

The German angle test specimens were monitored under standard laboratory conditions for cracking. The time to cracking, number of cracks, and average width of cracks, if any, would be recorded.

SPS plate test. This restrained shrinkage test had been identified as a candidate for further study in the Phase I program (Emmons and Vaysburd 1995). The specimen was a nominal 51- by 102- by 1,321-mm (2- by 4- by 52-in.) beam.

The repair material is cast against a thin steel plate on the bottom. The plate had a layer of epoxy and was impregnated with sand grit applied to improve bond to the repair material. The test involved the measurement of upward tip deflection at the unrestrained end of the specimen at three locations over time under standard laboratory conditions. In other words, the curling experienced by the beam was monitored. The specimen was supported by a rigid steel channel. Figure 7 shows the SPS plate test specimen and the associated tip curling.

Tensile strength

The primary purpose of this test was to determine the direct tensile strength for each of the materials to be used as the benchmark value for setting the

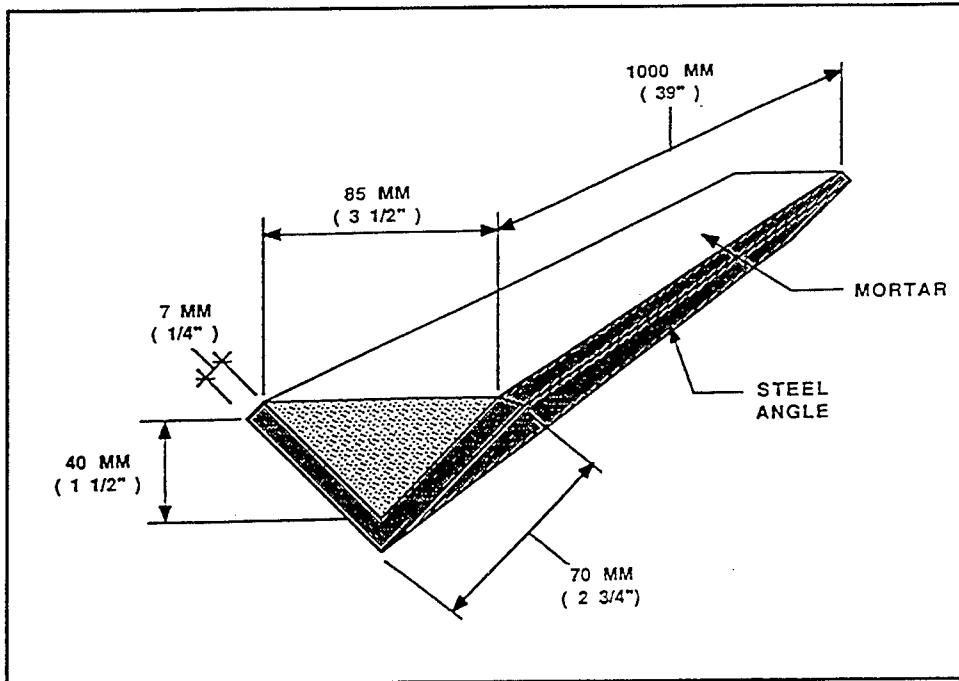


Figure 5. German angle test specimen



Figure 6. Application of bonding agent to German angle prior to casting specimen

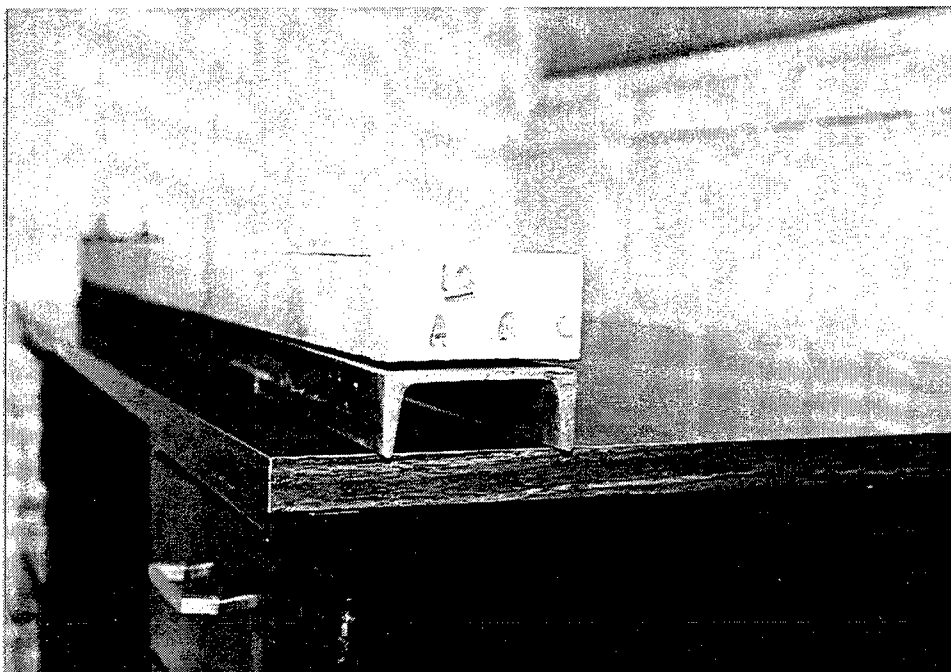


Figure 7. SPS plate test

percentage load levels to be used in the tensile creep tests described in the following section. There presently is no standard method for measurement of direct tensile strength.

Accordingly, the test specimen and load frame as shown in Figure 8 was developed for the purpose of assessing direct tensile strength. Nine 76- by 305-mm (3- by 3- by 12-in.) specimens were cast for each material for testing at 3, 7, and 28 days. Note that the specimens were notched at midheight using a 12.7- mm (1/2-in.) half-round wood stock providing for a nominal cross section at the failure zone of 51 by 76 mm (2 by 3 in.). Figure 9 shows a tensile strength specimen just after fracture.

Tensile creep

There has been considerable attention in the literature regarding the effects of tensile creep in concrete (Cook and Chindaprasirt 1981, Kovler 1995, Al-Kubaisy and Young 1975; Bissonnette and Pigeon 1995; and Cook 1972). This notion that concrete also creeps in tension has become of more interest recently because repair in tension zones of concrete structures tends to have a higher incidence of cracking, disbondment, and failure. Some repair materials appear to have been more durable and to have had less incidence of cracking than others. It has been proposed that tensile creep may in essence mitigate, at least to some degree, the cracking that may be associated with restrained drying shrinkage.

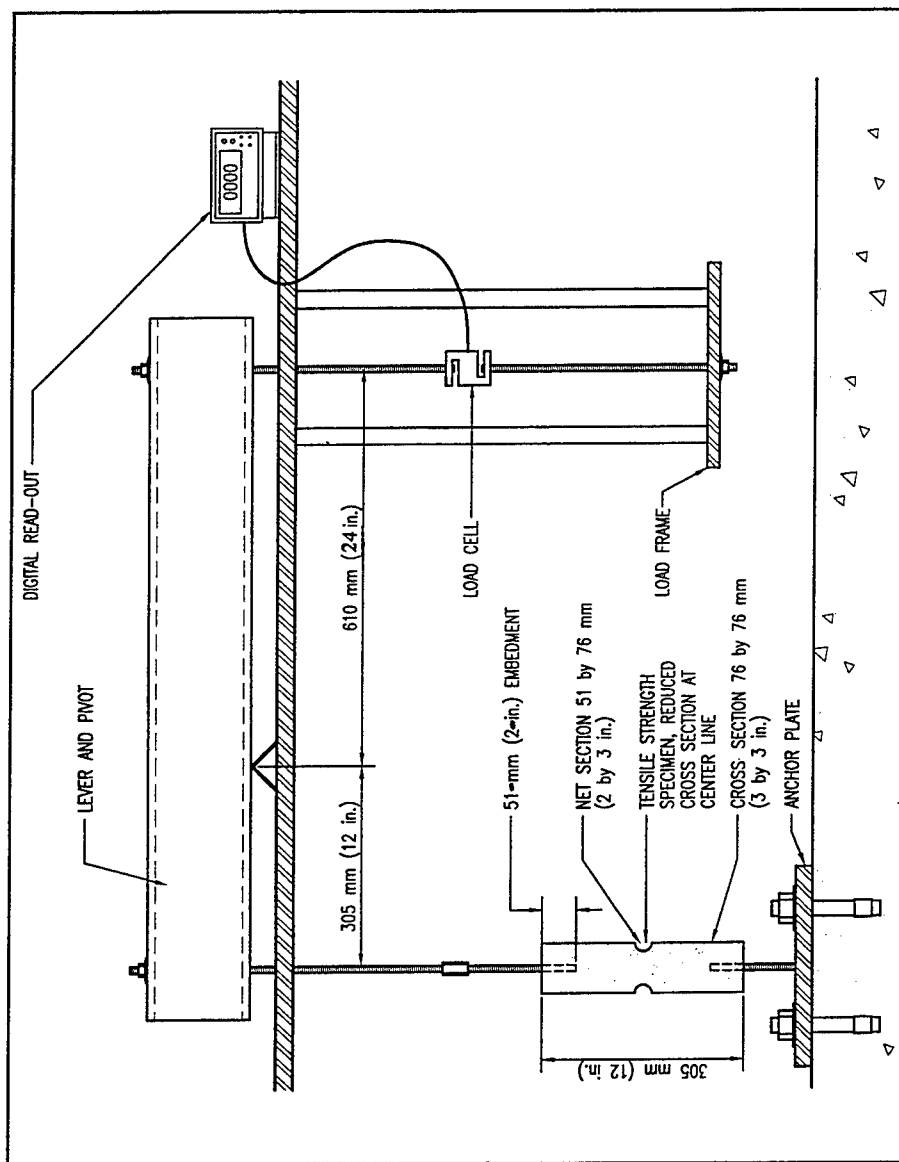


Figure 8. Tensile strength test

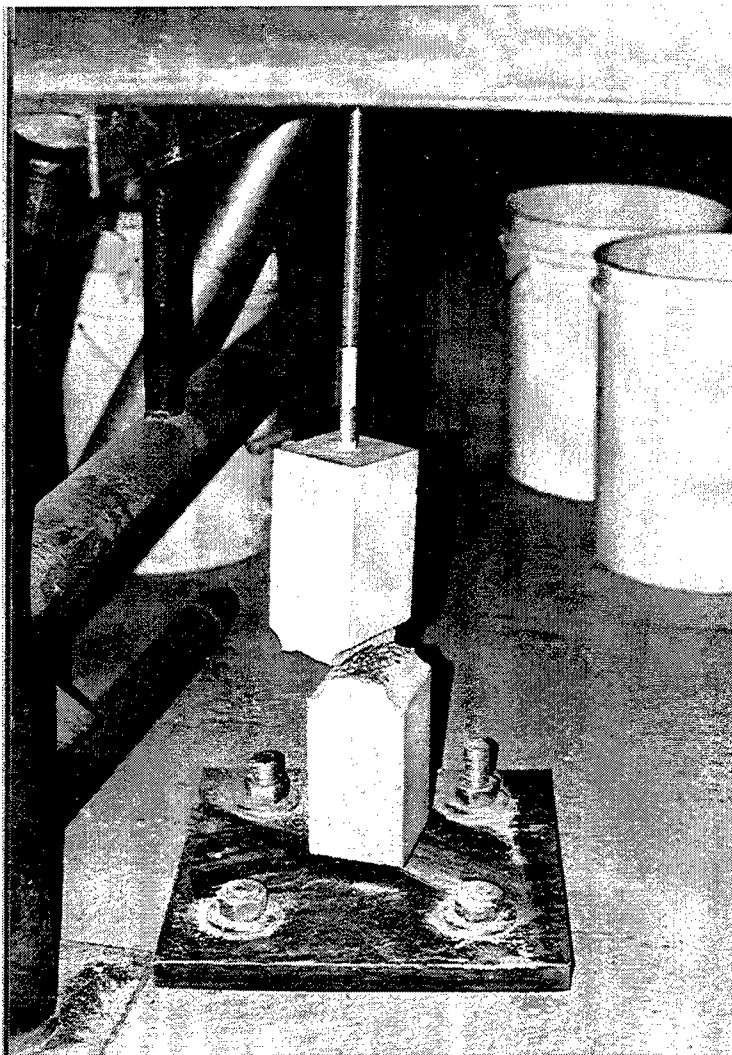


Figure 9. Fracture of tensile strength specimen

To gain a better understanding of the tensile creep phenomenon, two 76- by 76- by 305-mm (3- by 3- by 12-in.) specimens were loaded in direct tension to a nominal stress level equivalent to 40 percent of the tensile strength determined at 3, 7, and 28 days. Thus, initial loading was at 3 days, with a load increase at 7 days, then at 28 days where it remained constant for the duration of the test.

The elongation of the specimen over time was monitored under standard laboratory conditions, using a mechanical strain gauge with a 250-mm (10-in.) gauge length. Shrinkage specimens of the same size as the loaded specimens were concomitantly monitored to observe effects of drying shrinkage. Figure 10 shows a schematic of the tensile creep loading frames. The position of the ballast weight was varied to achieve the required nominal stress of 40 percent of the tensile strength. Figure 11 shows measurements being made on a tensile creep specimen.

Four of the materials, No. 7, 8, 10, and 12, experienced delayed failures in tensile creep after considerable time at a nominal stress level of 40 percent of

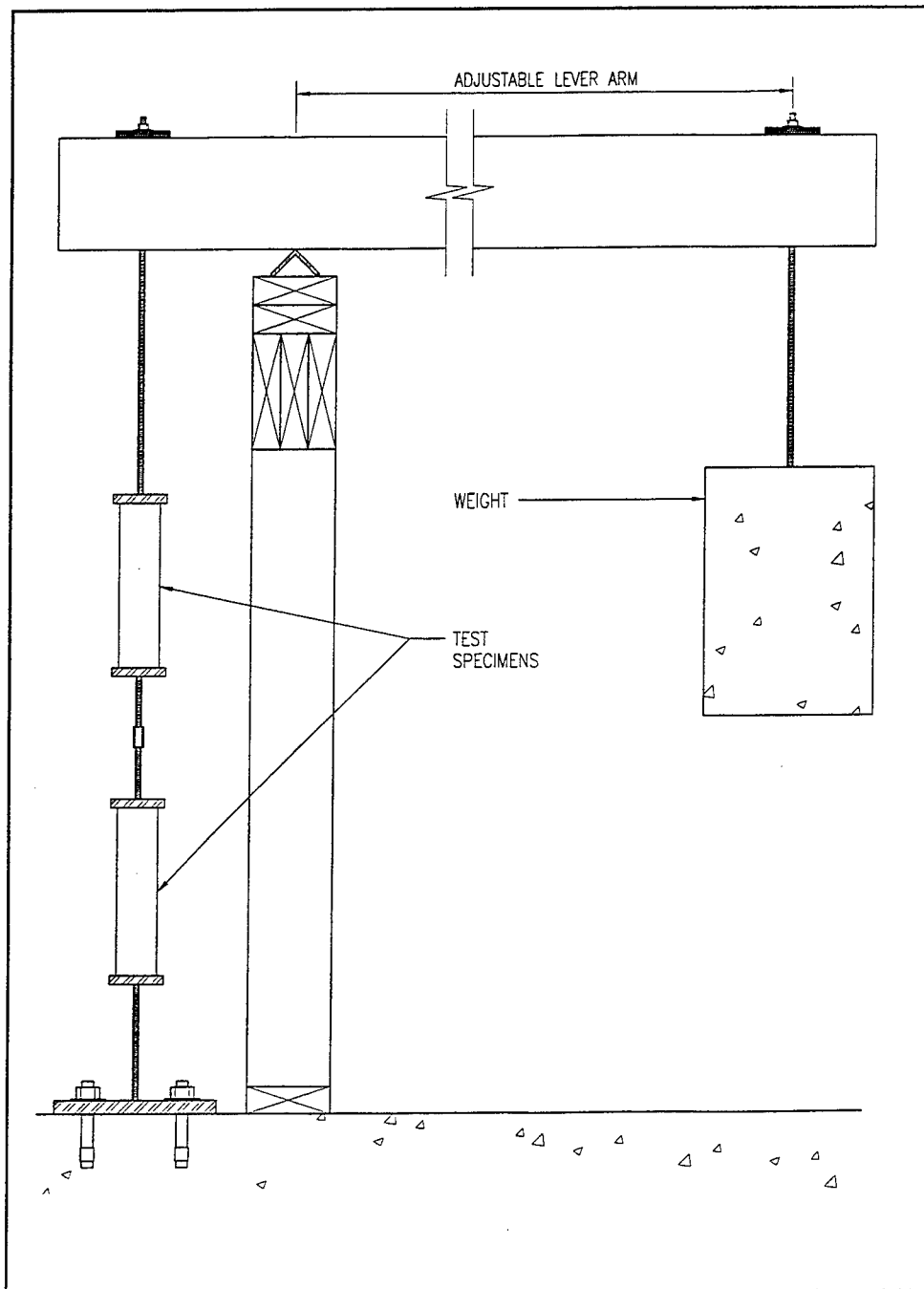


Figure 10. Tensile creep test frame

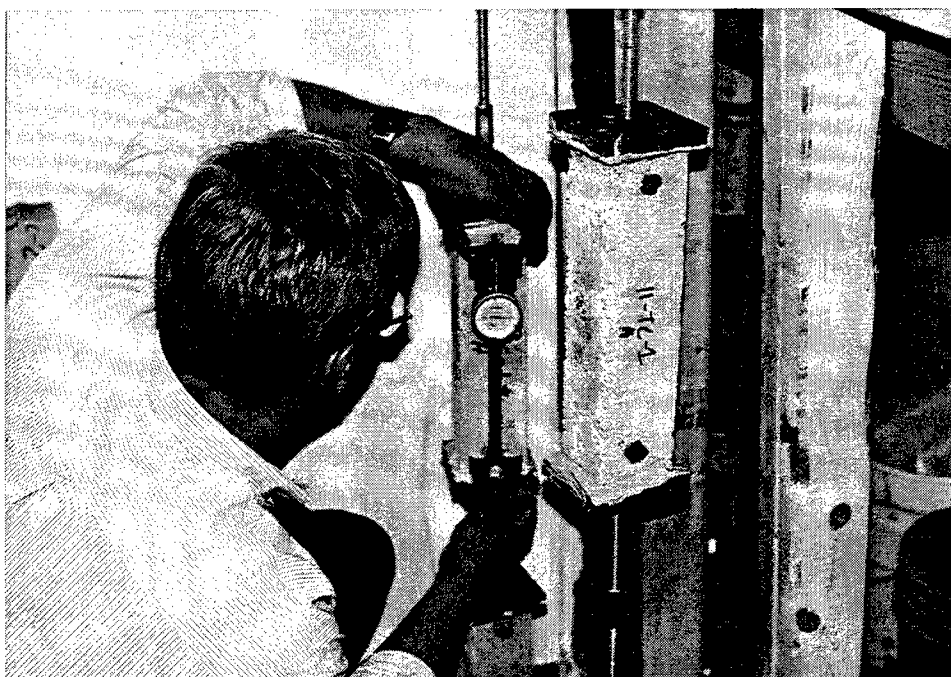


Figure 11. Strain measurement on tensile creep specimens

the ultimate strength. The tests were repeated and delayed failure occurred again for Materials No. 8, 10, and 12. The decision was made to reduce the applied stress to 20 percent of the ultimate tensile strength. At this stress level, the materials were able to sustain load without failure for the duration of test.

3 Test Results

General

The results from the laboratory evaluation conducted as part of the Phase II program are summarized in this chapter. Where appropriate, selected comparisons of measured material behavior are made. The extensive volume of data generated in the laboratory evaluation program is presented in Appendices B through I in order to establish a database of repair material behavior that may be used at a later time for comparison purposes. In this way, as material formulations change or new materials are introduced into the marketplace, the body of data generated in this experimental laboratory program may be used for comparison purposes.

Compressive Strength

Test results for compressive strength of 76- by 152-mm (3- by 6-in.) specimens are summarized in Table 2. The average 28-day compressive strength ranged from a low of 28.0 MPa (4,060 psi) for Material No. 8 to a high of 84.3 MPa (12,220 psi) for Material No. 4. Generally, a compressive strength of 34.5 MPa (5,000 psi), similar to that exhibited by many existing structures, is adequate for most repair applications unless special conditions warrant otherwise.

Parallel compressive strength tests of 152- by 305-mm (6- by 12-in.) specimens were performed for Materials No. 3, 9, and 10 to assess the relationship, if any, between specimen sizes. The test results for the specimens are summarized in Table 3. Typically, a 76- by 152-mm (3- by 6-in.) specimen would show approximately a 5 percent increase in compressive strength over a 152- by 305-mm (6- by 12-in.) specimen due to the increasing probability of finding flaws and defects. Table 4 shows a strength variation much different than anticipated. Material No. 3 is an anomaly, whereas Materials No. 9 and 10 show a much greater strength increase for size effect. One possible explanation for the greater strength observed in the larger cylinders was the short curing period since the specimens were not moist cured for 28 days, as is typical for quality assurance testing in construction projects.

Table 2
Results of Compressive Strength Tests for 76- by 152-mm (3- by 6-in.) Specimens

Material No.	Average Compressive Strength, MPa (psi)		
	3 Days	7 Days	28 Days
1	35.2 (5,100)	37.9 (5,500)	45.6 (6,610)
2-A ¹	28.1 (4,070)	37.4 (5,420)	45.5 (6,600)
2-B ¹	37.7 (5,470)	47.3 (6,860)	53.5 (7,760)
3	21.0 (3,040)	29.4 (4,260)	43.9 (6,360)
4-A ¹	66.9 (9,710)	70.2 (10,180)	84.3 (12,220)
4-B ¹	52.2 (7,570)	64.7 (9,380)	74.7 (10,840)
5	44.5 (6,450)	47.7 (6,920)	67.8 (9,830)
6	28.5 (4,140)	40.7 (5,910)	66.7 (9,670)
7	19.5 (2,830)	25.7 (3,730)	29.9 (4,330)
8	18.3 (2,660)	21.5 (3,120)	28.0 (4,060)
9	21.0 (3,050)	25.8 (3,740)	33.0 (4,780)
10A	25.0 (3,630)	27.4 (3,970)	36.1 (5,230)
10B	26.4 (3,830)	26.0 (3,780)	34.6 (5,020)
11	38.1 (5,520)	45.2 (6,550)	66.3 (9,620)
12	25.6 (3,710)	33.7 (4,890)	47.8 (6,940)
¹ Tests were conducted on multiple batches.			

Table 3 Results of Compressive Strength Tests for 152- by 305-mm (6- by 12-in.) Specimens			
Material No.	Average Compressive Strength MPa (psi)		
	3 Days	7 Days	28 Days
3	10.8 (1,560)	16.5 (2,400)	26.4 (3,830)
9	35.2 (5,110)	35.6 (5,160)	45.5 (6,600)
10	30.8 (4,470)	33.8 (4,900)	43.0 (6,240)

Table 4 Compressive Strength Comparison Between 76- by 152-mm (3- by 6-in.) and 152- by 305-mm (6- by 12-in.) Specimens				
Material No.	Age at Testing (days)	Compressive Strength MPa (psi)		Percent Change
		76 by 152 mm (3 by 6 in.)	152 by 305 mm (6 by 12 in.)	
3	3	21.0 (3,040)	10.8 (1,560)	-48.6
	7	29.4 (4,260)	16.5 (2,400)	-43.9
	28	43.4 (6,360)	26.4 (3,830)	-39.2
9	2	21.0 (3,050)	35.2 (5,110)	+67.6
	7	25.8 (3,740)	35.6 (5,160)	+38.0
	28	33.0 (4,780)	45.5 (6,600)	+37.9
10	3	25.0 (3,630)	30.8 (4,470)	+23.2
	7	27.4 (3,970)	33.8 (4,900)	+23.4
	28	36.1 (5,230)	43.0 (6,240)	+19.1

Smaller cylinders will dry out more and have more drying shrinkage effects than larger cylinders. It is also possible that differences in batching small quantities of material may have contributed to the lack of correlation between the two specimen sizes.

Flexural Strength

The results of the flexural strength tests are presented in Table 5. The values for the 28-day range from a low of 1.0 MPa (139 psi) for Material No. 8 to a high of 5.6 MPa (805 psi) for Material No. 12. In general, the flexural strengths were lower than typically expected after 28 days under

controlled laboratory conditions. All but Material No. 12 exhibited flexural strengths less than 10 percent of the respective 28-day strengths. These low flexural strengths may be attributed to shrinkage effects experienced by the materials undergoing the manufacturers' recommended curing regime. Also, the outer portions of the specimens would be most affected by air storage following curing, and the resulting effects would be most pronounced in a flexural test.

In general, it is anticipated that polymer added to a mixture, if all other mixture factors remain constant, would increase the tensile and flexural strength. The flexural strengths at 28 days for the polymer-modified materials range from 1.0 to 5.6 MPa (139 to 805 psi), with an average flexural strength of 3.1 MPa (443 psi). The range for the materials which did not contain polymers was 2.0 to 5.4 MPa (289 to 758 psi), with an average of 3.7 MPa (531 psi).

Table 5
Flexural Strength Test Results

Material No.	Flexural Strength MPa (psi)			
	3 Days	7 Days	28 Days	Percent of 28-Day Compressive Strength
1	3.3 (473)	2.8 (401)	2.0 (289)	4
2	3.9 (560)	3.6 (526)	3.1 (445)	7
3	2.3 (329)	2.6 (371)	2.9 (421)	7
4	7.0 (1,022)	4.9 (704)	5.4 (779)	7
5	6.0 (865)	5.1 (738)	5.2 (758)	8
6	3.6 (523)	4.6 (664)	3.4 (493)	5
7	2.0 (294)	2.8 (412)	2.5 (365)	8
8	1.9 (272)	1.9 (273)	1.0 (139)	3
9	3.7 (535)	4.5 (650)	2.9 (415)	9
10	5.1 (746)	3.6 (519)	3.4 (495)	9
11	4.2 (608)	3.8 (546)	3.5 (503)	5
12	5.1 (737)	5.0 (720)	5.6 (805)	12

Tensile Strength

The results of the tensile strength tests are shown in Table 6. The 28-day tensile strengths ranged from 0.6 MPa (94 psi) for Material No. 5 to 5.1 MPa (742 psi) for Material No. 12. Similar to the flexural strengths, the majority of the materials exhibited tensile strengths less than 10 percent of the compressive strength. Typically, the flexural strength will be higher than the tensile

strength, because the flexural test produces a linear stress variation across the section. However, many of the 28-day tensile strengths were similar to the flexural strengths. In fact, 5 of the 12 materials exhibited tensile strengths greater than the flexural strength. The probable reason for this is that the flexural specimens were loaded at a slow rate compared to the tensile strength specimens.

It is interesting to note that the average tensile strength for the polymer-modified materials was higher (3.1 MPa (443 psi)) versus that for those materials in which polymer was not added (2.3 MPa (334 psi)). This was as anticipated.

Table 6 Tensile Strength Test Results				
Material No.	Tensile Strength MPa (psi)			
	3 Days	7 Days	28 Days	Percent of 28-Day Compressive Strength
1	2.7 (388)	2.5 (366)	3.1 (451)	7
2	2.1 (301)	2.2 (318)	2.8 (399)	6
3	1.3 (194)	2.2 (319)	3.5 (513)	8
4	2.3 (335)	2.4 (355)	2.5 (360)	3
5	1.0 (138)	0.8 (115)	0.6 (94) ¹	1
6	1.5 (218)	1.6 (232)	2.2 (323)	3
7	1.8 (262)	2.1 (302)	3.2 (467)	11
8	2.2 (312)	1.5 (212)	1.7 (215)	6
9	1.8 (258)	1.4 (202)	2.2 (323)	7
10	3.5 (512)	2.8 (409)	2.8 (402)	8
11	2.3 (337)	2.5 (369)	2.7 (390)	4
12	2.2 (322)	4.0 (583)	5.1 (742)	15
¹ Specimens failed at embedment stud due to shrinkage cracking.				

Coefficient of Thermal Expansion

The results from the coefficient of thermal expansion tests are summarized in Table 7. The results are somewhat higher than expected for concrete materials. The coefficient of thermal expansion of the polymer-modified materials averaged about 20 percent higher than the materials without a polymer additive.

Table 7 Coefficient of Thermal Expansion Test Results	
Material No.	Coefficient of Thermal Expansion
	10⁻⁶ per °C (10⁻⁶ per °F)
1	10.6 (5.8)
2	14.0 (7.8)
3	12.8 (7.1)
4	14.9 (8.3)
5	14.0 (7.8)
6	16.7 (9.3)
7	15.3 (8.5)
8	16.6 (9.2)
9	12.4 (6.9)
10	17.8 (9.9)
11	13.7 (7.6)
12	16.7 (9.3)

Modulus of Elasticity and Poisson's Ratio

Table 8 presents the average modulus of elasticity measured for each of the materials. Poisson's ratio determined for those select materials in which it was measured is also shown in Table 8.

Table 8 Modulus of Elasticity and Poisson's Ratio		
Material No.	Modulus of Elasticity	Poisson's Ratio
	MPa x 10⁴ (psi x 10⁶)	
1	1.93 (2.8)	---
2	2.17 (3.2)	---
3	2.57 (3.7)	0.24
4	2.64 (3.8)	---
5	3.10 (4.5)	---
6	3.69 (5.3)	---
7	1.84 (2.7)	---
8	1.84 (2.7)	---
9	1.75 (2.5)	0.23
10	2.87 (4.2)	---
11	4.11 (5.9)	---
12	2.10 (3.0)	---

The 28-day modulus of elasticity ranged from a low of 1.75×10^4 MPa (2.5×10^6 psi) to a high of 4.11×10^4 MPa (5.9×10^6 psi). The modulus of elasticity of the materials containing polymer were, on average, slightly lower than those which did not.

Poisson's ratio was measured for Material No. 3 (polymer-modified) and No. 9 (nonpolymer-modified). There was no appreciable difference in the measured Poisson's ratio for the two materials. The values were consistent with that typically measured for cement-based concrete materials.

Drying Shrinkage

In the drying shrinkage tests, the specimens were monitored over a period of about 18 months. The readings were reported from age of 1 day except for Materials No. 3 and 11 because of an apparent oversight in testing schedule. Table 9 summarizes the average 28-day and average maximum drying shrinkage determined under different humidity conditions. Table 9 also presents the ratio of the average measured peak shrinkage strain to the average 28-day shrinkage value. Overall the drying shrinkage at 28 days ranged from 16 to 1,779 millionths at 50 percent humidity.

Table 9 Results of Drying Shrinkage Test									
Material No.	28-Day Shrinkage, Millionths			Peak Shrinkage, Millionths			Peak Shrinkage/28-day shrinkage ratio		
	20% Rel. Hum.	50% Rel. Hum.	90% Rel. Hum.	20% Rel. Hum.	50% Rel. Hum.	90% Rel. Hum.	20% Rel. Hum.	50% Rel. Hum.	90% Rel. Hum.
1	209	178	58	409	366	86	2.0	2.1	1.5
2	385	391	306	1,060	1,032	532	2.8	2.6	1.7
3	474	479	277	1,109	1,116	541	2.3	2.3	2.0
4	196	201	167	689	703	237	3.5	3.5	1.4
5	231	258	204	571	690	330	2.5	2.7	1.6
6	416	301	267	910	878	598	2.2	2.9	2.2
7	1,922	1,779	1,142	3,208	2,682	1,187	1.7	1.5	1.0
8	410	305	171	1,194	1,109	527	2.9	3.6	3.1
9	435	429	261	852	877	505	2.0	2.0	1.9
10	0	16	(-89)	716	678	6	N/A	42.4	N/A
11	337	339	213	628	641	338	1.9	1.9	1.6
12	323	293	201	680	634	355	2.1	2.2	1.8

It is interesting to note that the average ratio of peak to 28-day shrinkage strain at 50 percent humidity was 2.5, if Material No. 10 is excluded. Material No. 10 exhibited very anomalous behavior that is not understood. It is clear that to adequately address shrinkage and its long-term implications, a value beyond the 28-day measurement is required for test specimens of the dimension used.

Figures 12 through 23 present the average measured drying shrinkage versus time for each of the 12 materials. As is expected, the highest shrinkage is obtained for 20 percent humidity, followed by the 50 and 90 percent humidity environments. For the 20 and 50 percent humidities, the trend is for the greatest shrinkage to occur within the first 50 days or so, followed by a more gradual increase. By the end of the monitoring period (about 18 months), the shrinkage had generally leveled off, except that Material No. 1 showed a slight expansion in the last 3 months.

The graphs for the 90 percent humidity cases did not follow the same trend as those for the 20 and 50 percent humidity cases. The trend initially was similar in that there was a rapid increase in shrinkage. Then after some time, the results generally indicate that the specimens stop shrinking and begin to expand. This expansion then more or less stabilizes. The point at which the drying shrinkage reverses is believed to be related to completion of autogenous shrinkage. From this point in time, the material appears to be drawing in moisture to reach moisture equilibrium with the environment.

Ring Test

Table 10 indicates the age when cracks first appeared in the ring test specimens. Note that cracks never formed in the ring test specimen for Materials No. 10 and 12. Also shown for the specimens is the measured crack widths when the ring specimens first cracked and after approximately 18 months. The computed strain associated with the measured crack widths at the end of testing is also shown. This strain is computed by taking the average crack width of all cracks in the specimens and dividing by the ring circumference. It is interesting to note that the strain computed from the crack widths at the end of testing correlate to some degree the peak shrinkage strains measured in the drying shrinkage test (Table 9).

Figures 24 and 25 present the changes in total average crack width with time for the nonpolymer and polymer-modified materials, respectively.

SPS Plate Test

Figures 26 and 27 present the results of the SPS plate test. The deflection was measured at the free end of the beam for those materials in which there was measurable curling. The data indicate a relatively large increase in tip deflection in the first 28 days followed by a relatively modest increase in

Table 10
Results of Time to First Cracking in Ring Test

Material No.	Age at First Crack	Ave. Width of First Crack mm (in.)	Sum of Crack Widths at End of Test mm (in.)	Strain Implied from Crack Widths at End of Test (Millionths)
1	6 days	0.020 (0.0007)	0.665 (0.0262)	667
2	22 days	0.003 (0.0001)	0.363 (0.0143)	364
3	17 days	0.005 (0.0002)	0.683 (0.0269)	685
4	140 days	0.132 (0.0052)	0.559 (0.0220)	560
5	10 days	0.003 (0.0001)	0.838 (0.0330)	840
6	7 days	0.003 (0.0001)	1.803 (0.0710)	1,808
7	4 days	1.181 (0.0465)	3.404 (0.1340)	3,414
8	8 days	0.508 (0.0200)	1.219 (0.0480)	1,222
9	23 days	0.036 (0.0014)	0.953 (0.0375)	955
10	no cracks	0	0	0
11	15 days	0.145 (0.0057)	0.808 (0.0318)	810
12	no cracks	0	0	0

deflection over the remaining period of the test (about 18 months). Material No. 7 had a peak tip deflection of about 36 mm (1.4 in.), or about five times that of the next highest measured curling. It is interesting to note that Materials No. 2, 3, and 8, measuring the next highest curling in the SPS plate test, had, following Material No. 7, the highest measured peak shrinkage in the drying shrinkage test.

German Angle Test

No cracking was observed in the German angle test specimens over the 18-month test period. There was some disbondment noted along the angle surfaces despite the use of an epoxy bonding agent. Thus, the results from this test provided no definitive information with regard to proposed performance criteria.

Compressive Creep

Nominal sustained load stresses of 20 and 40 percent of compressive strength were applied to pairs of specimens beginning generally at 3 days. The load changed with the increased strength gain generally at 7 and 28 days. In some cases, the loading sequence varied slightly from this 3, 7 and 28 day protocol due to scheduling conflicts. The load was kept constant after 28 days. Elastic strains were measured following application of the load and changes in load. Strains were measured regularly over the 18-month test period. Strain

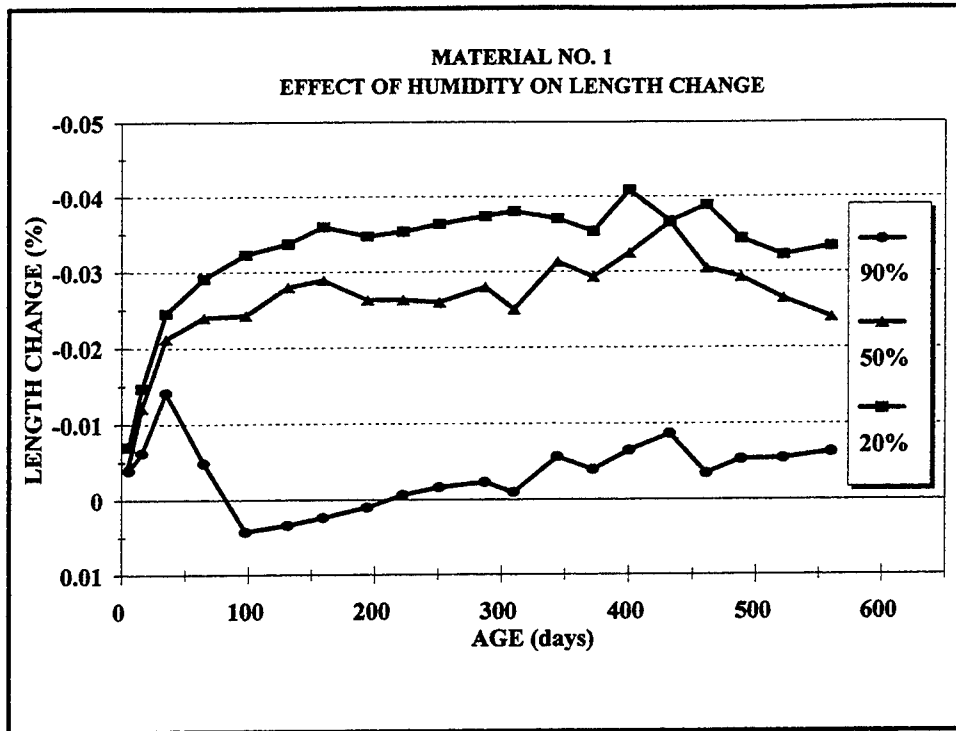


Figure 12. Effect of humidity on drying shrinkage over time for Material No. 1

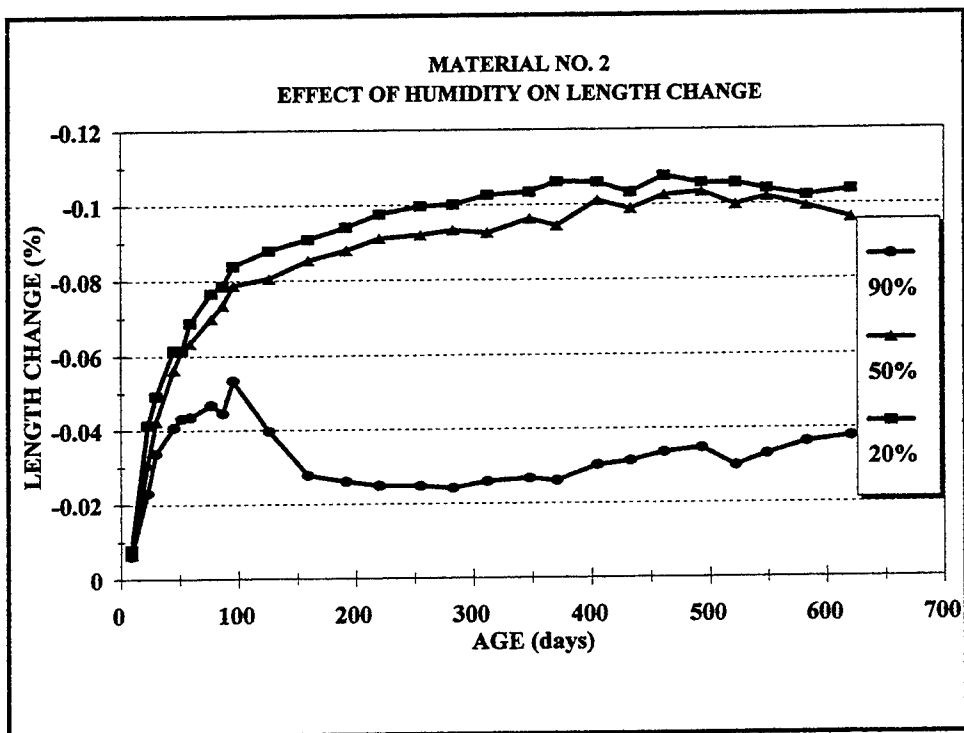


Figure 13. Effect of humidity on drying shrinkage over time for Material No. 2

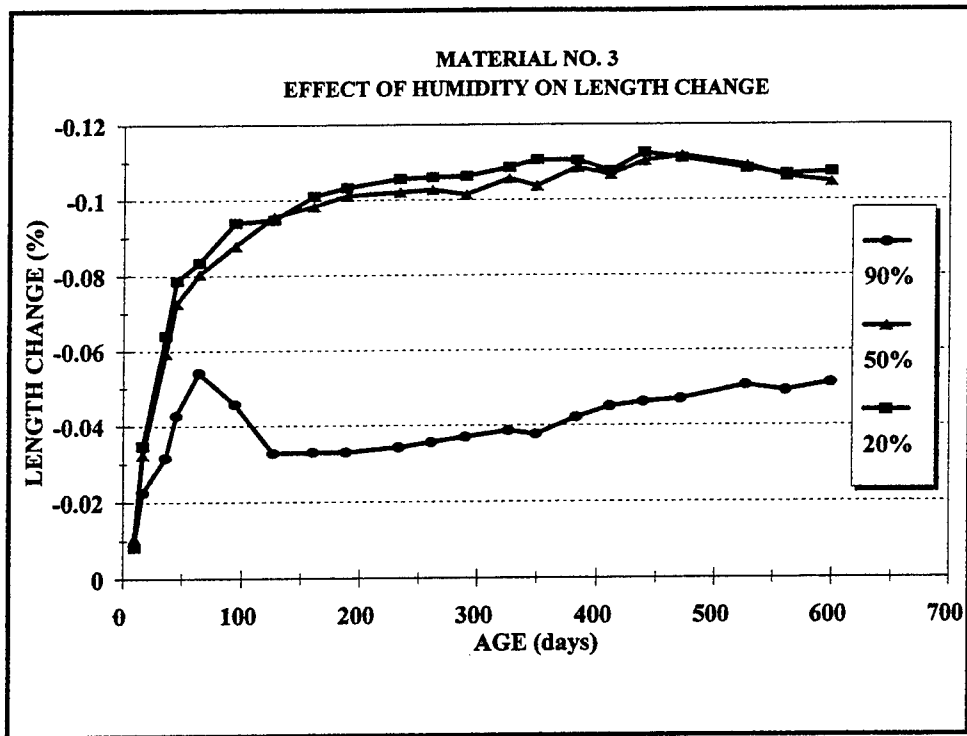


Figure 14. Effect of humidity on drying shrinkage over time for Material No. 3

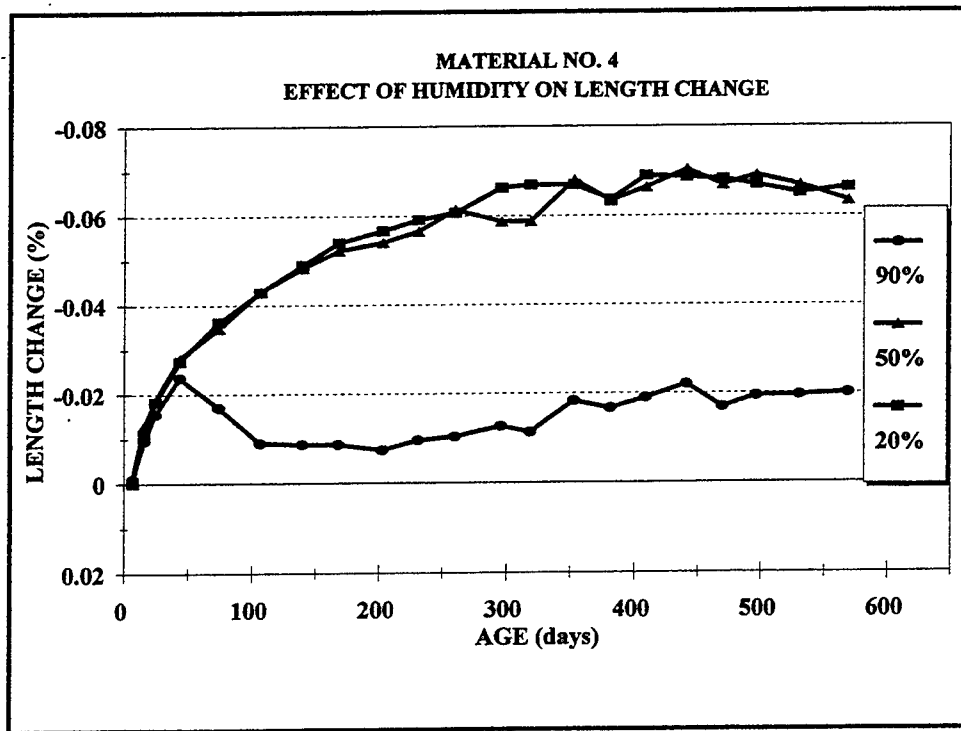


Figure 15. Effect of humidity on drying shrinkage over time for Material No. 4

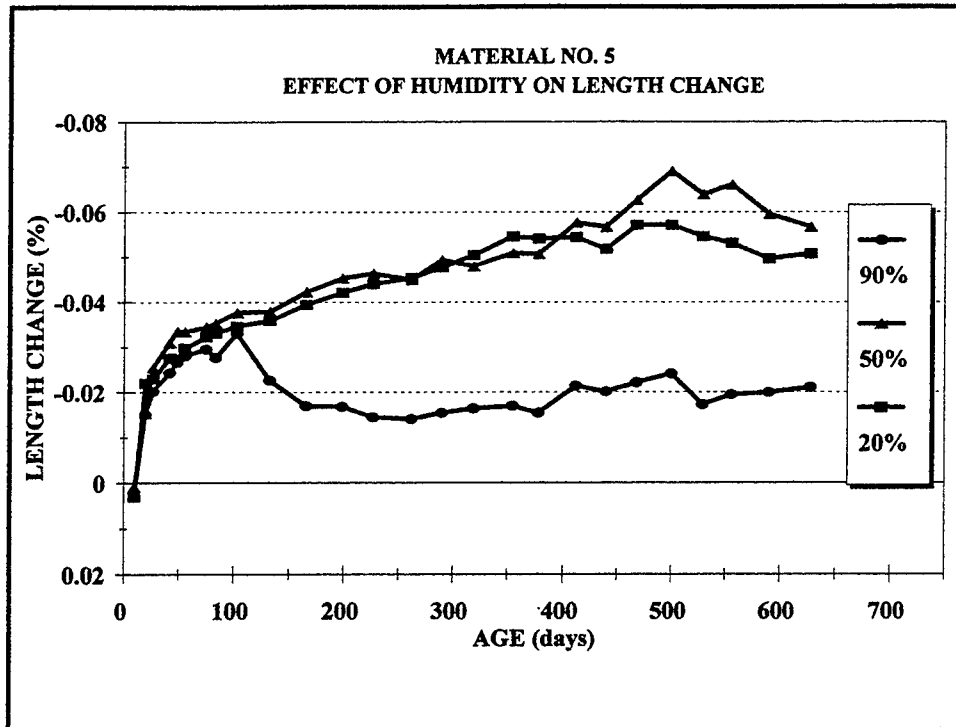


Figure 16. Effect of humidity on drying shrinkage over time for Material No. 5

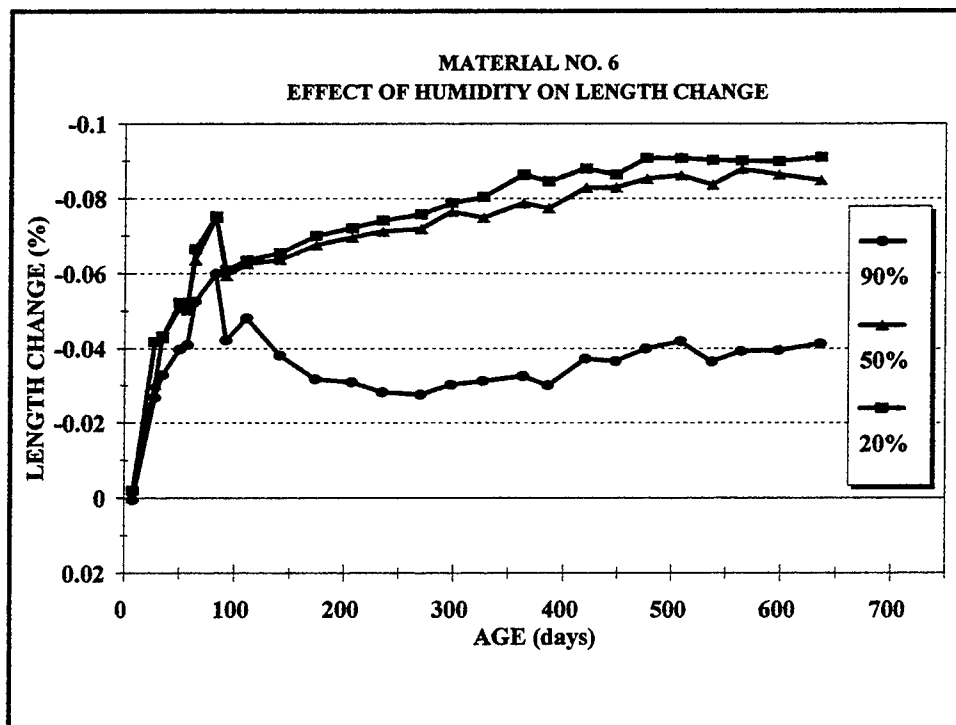


Figure 17. Effect of humidity on drying shrinkage over time for Material No. 6

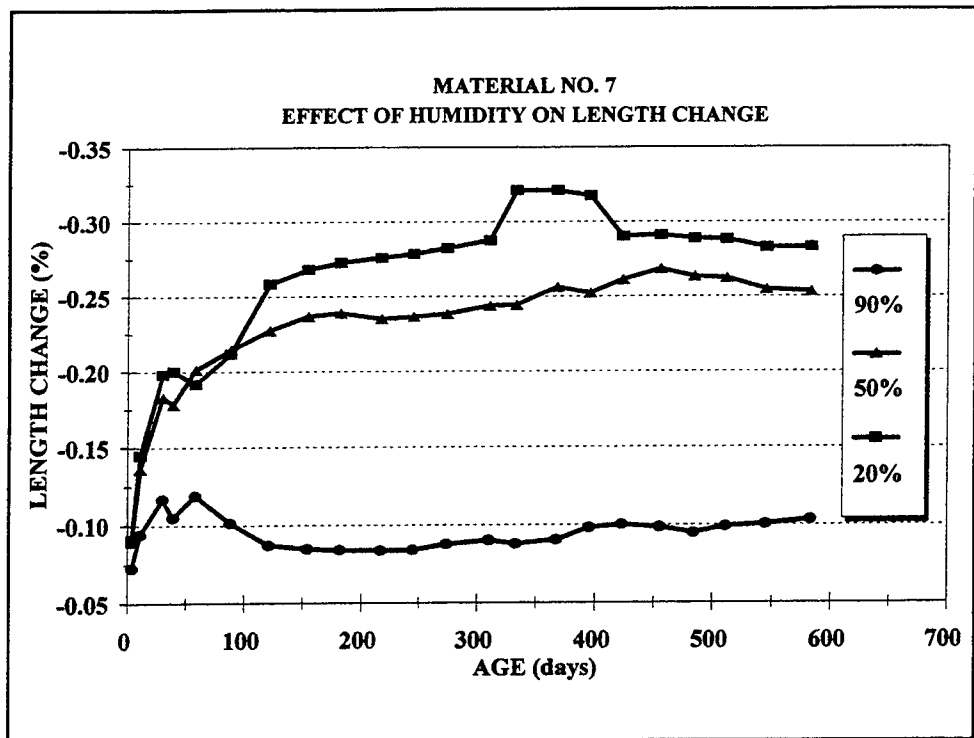


Figure 18. Effect of humidity on drying shrinkage over time for Material No. 7

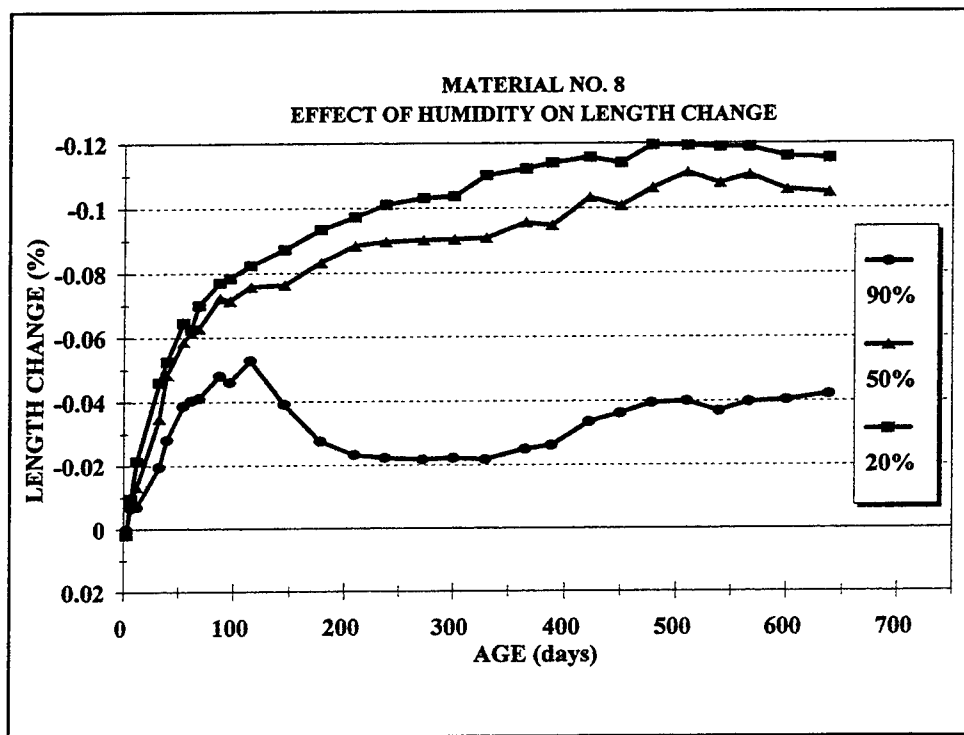


Figure 19. Effect of humidity on drying shrinkage over time for Material No. 8

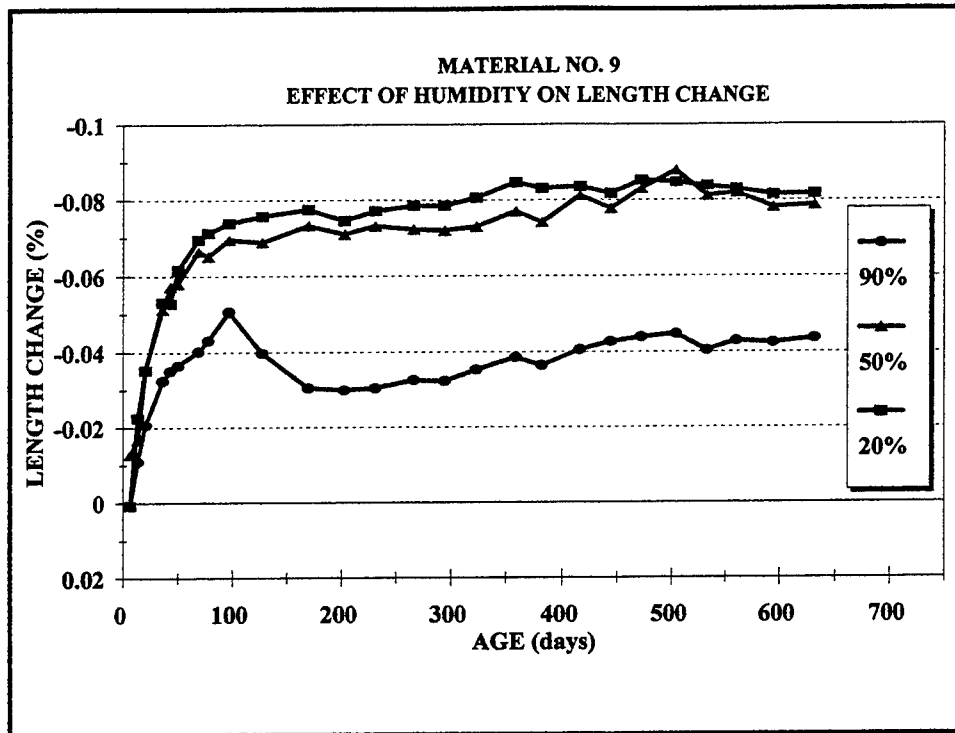


Figure 20. Effect of humidity on drying shrinkage over time for Material No. 9

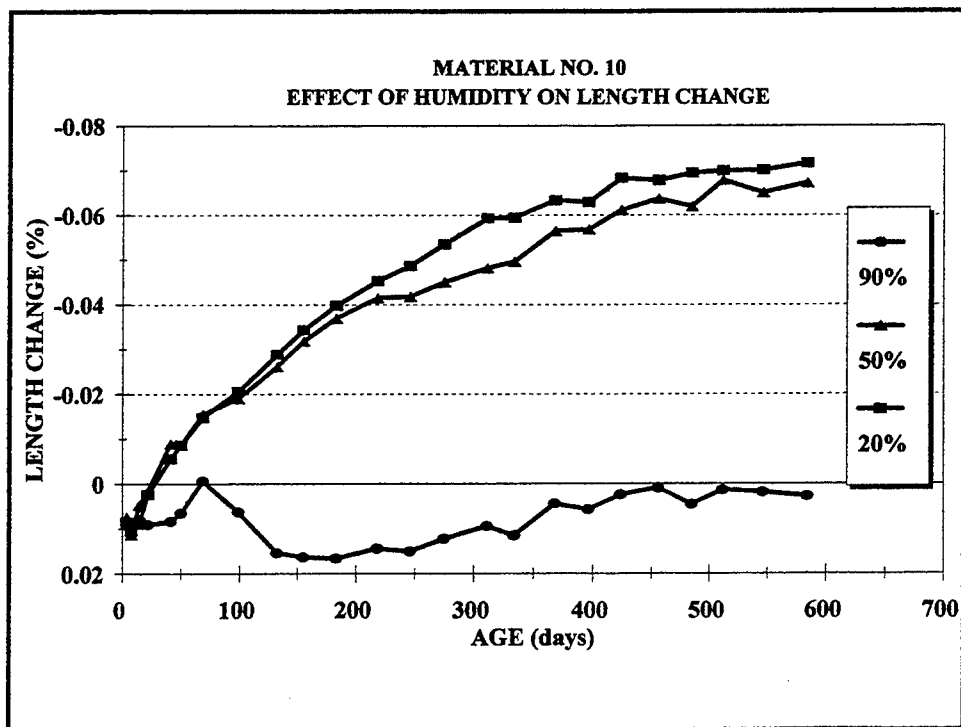


Figure 21. Effect of humidity on drying shrinkage over time for Material No. 10

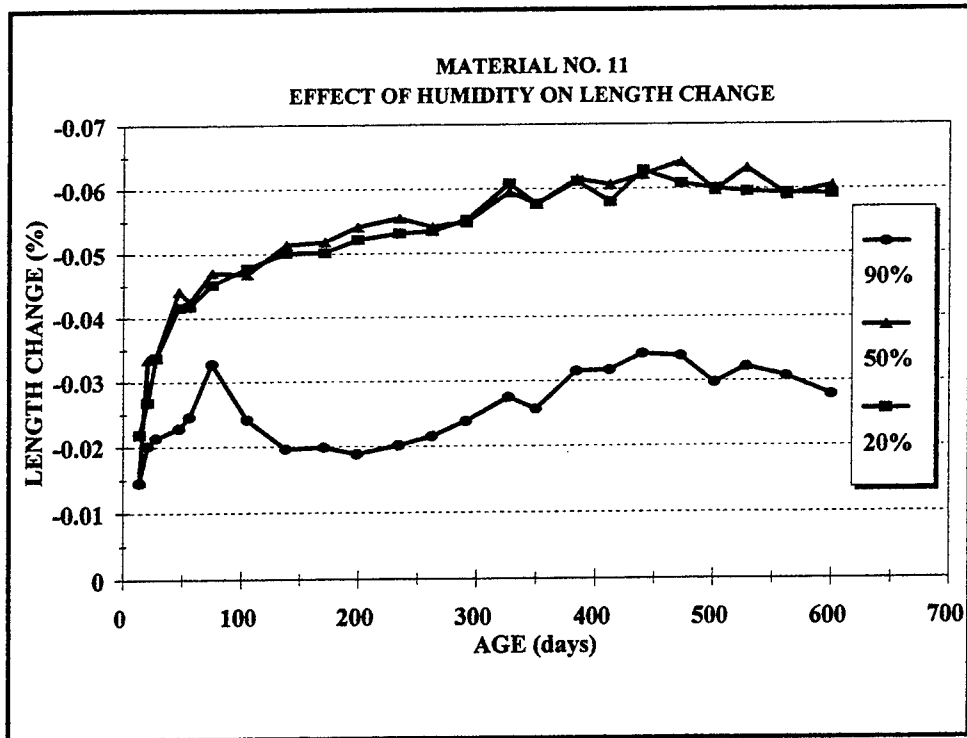


Figure 22. Effect of humidity on drying shrinkage over time for Material No. 11

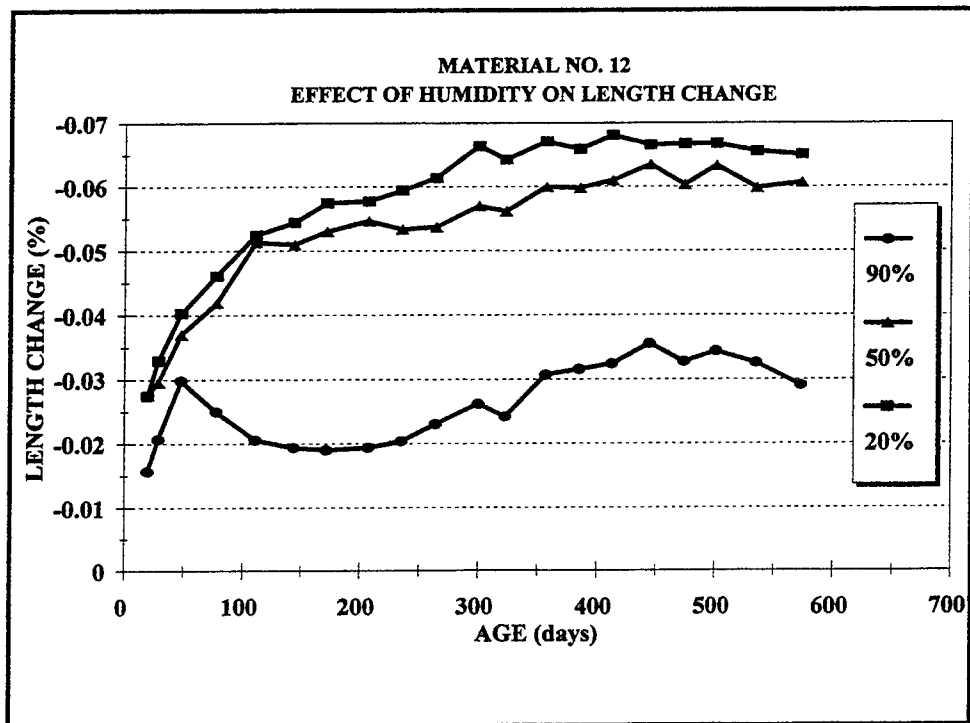


Figure 23. Effect of humidity on drying shrinkage over time for Material No. 12

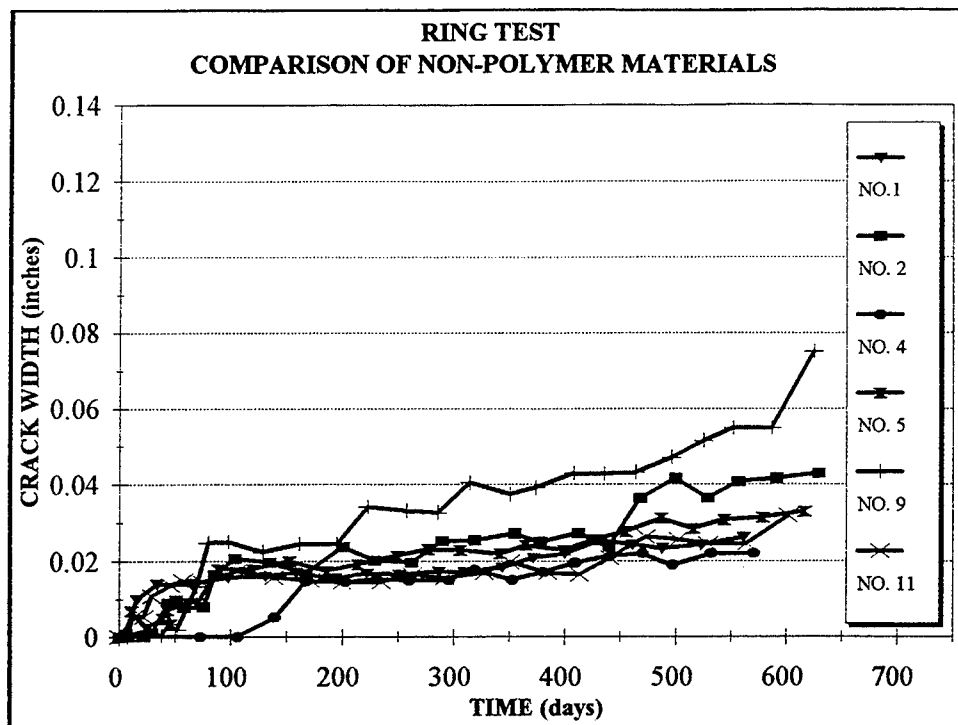


Figure 24. Change in cumulative total average crack width with time from ring test for portland-cement based materials (multiply inches by 25.4 to obtain millimetres)

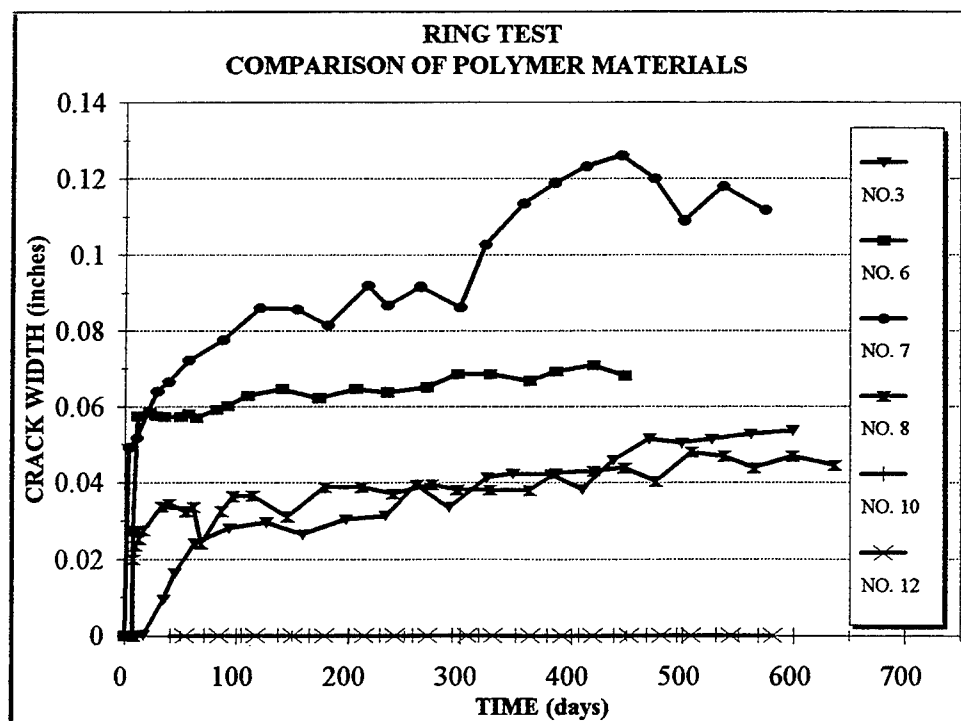


Figure 25. Change in cumulative average crack width with time from ring test for polymer-modified materials (multiply inches by 25.4 to obtain millimetres)

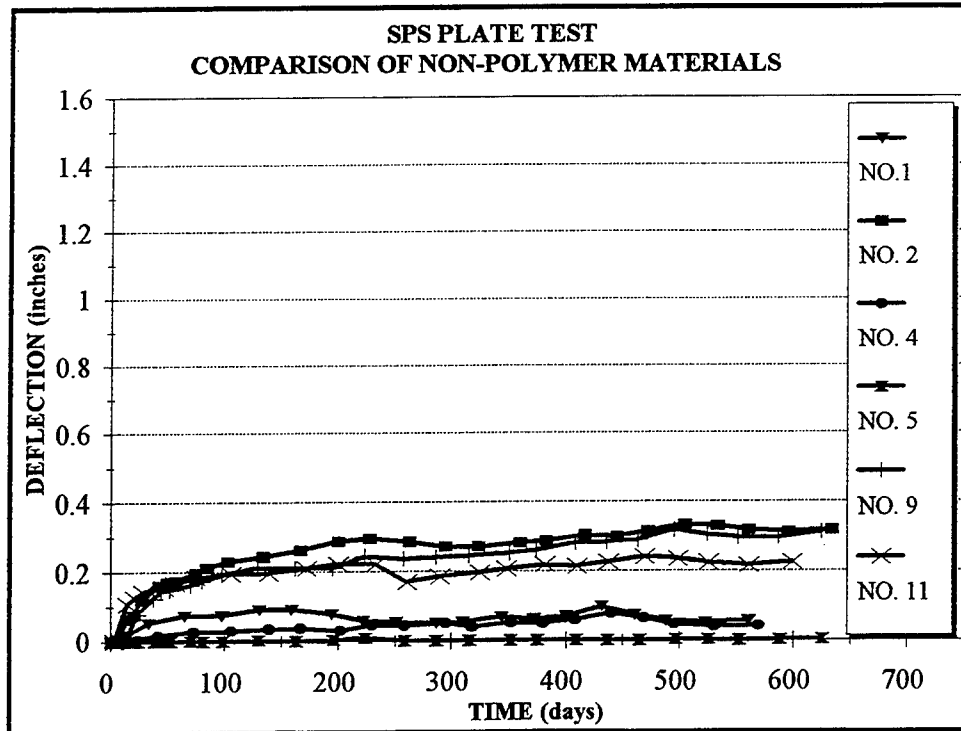


Figure 26. Tip deflection results from SPS plate test for nonpolymer-modified materials (multiply inches by 25.4 to obtain millimetres)

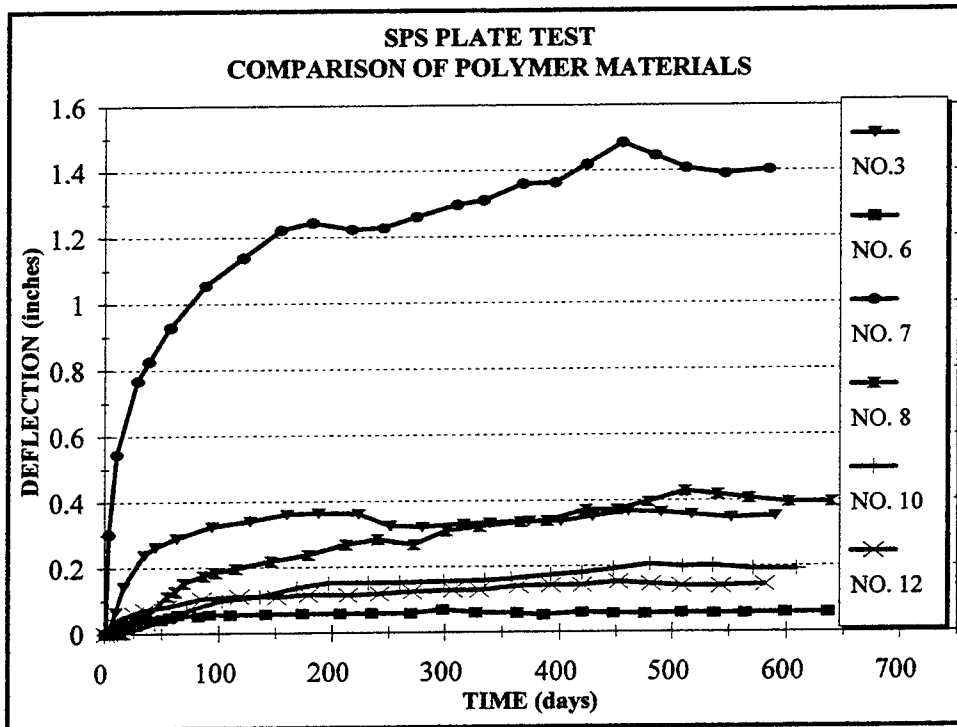


Figure 27. Tip deflection results from SPS plate test for polymer-modified materials (multiply inches by 25.4 to obtain millimetres)

measurements were also made on unloaded control cylinders of the same size and volume-to-surface ratio during the test period. Results of the strain measurements are shown in Figures 28 through 39. Note that in those cases where there were also parallel sealed specimens, there was no appreciable difference in compressive creep. Apparently, the thin epoxy did not adequately prevent moisture loss.

Compressive creep strains were calculated by subtracting the measured elastic strain from the total measured strain and subtracting the drying shrinkage strain measured in the unloaded control specimens. Specific creep strains for each material at the two load levels were calculated by dividing the creep strains by the applied load stress. The specific creep values were plotted versus time in logarithmic scale (Figures 40 through 51). A best fit line was then determined for each set of data. For comparison purposes, these equations were used to calculate the specific creep at 1 year. Table 11 summarizes the specific creep values at 1 year for each material. Specific creep of the polymer-modified materials averaged about 2.5 to 3.0 times higher than that for the materials without polymer additives.

Table 11
Compressive Creep Test Results Summary

Material No.	Specific Creep at 1 Year Millionths/MPa (Millionths/psi)	
	Low Stress	High Stress
1	49.9 (0.344)	65.4 (0.451)
2	104.4 (0.720)	87.5 (0.603)
3	244.7 (1.687)	277.5 (1.913)
4	118.5 (0.817)	37.7 (0.260)
5	86.7 (0.598)	81.5 (0.562)
6	69.6 (0.480)	126.5 (0.872)
7	391.2 (2.697)	505.5 (3.485)
8	311.7 (2.149)	274.7 (1.894)
9	153.3 (1.057)	188.7 (1.301)
10	222.1 (1.53)	295.4 (2.037)
11	28.1 (0.194)	70.01 (0.483)
12	205.1 (1.414)	167.8 (1.157)

The best fit lines for specific creep for both sustained stress levels should be reasonably similar. There can be some anticipated difference due to the level of microcracking that may be introduced with higher stress levels. The results in Figures 40 through 51 are reasonably consistent other than for Material No. 4. The reason for the difference in the recorded data at the two load levels

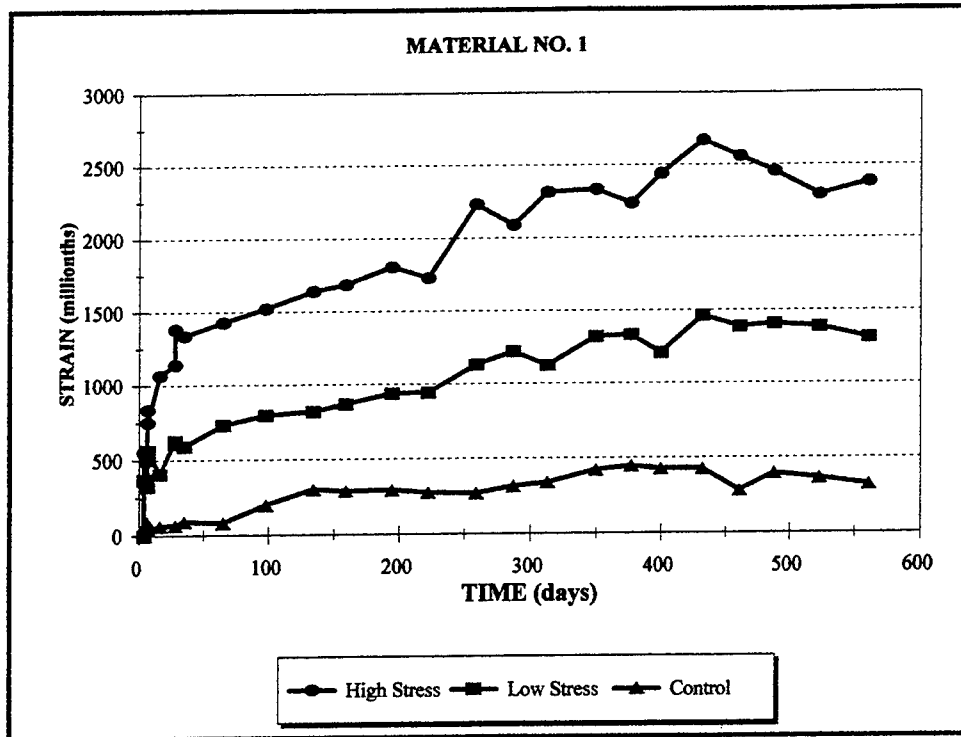


Figure 28. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 1

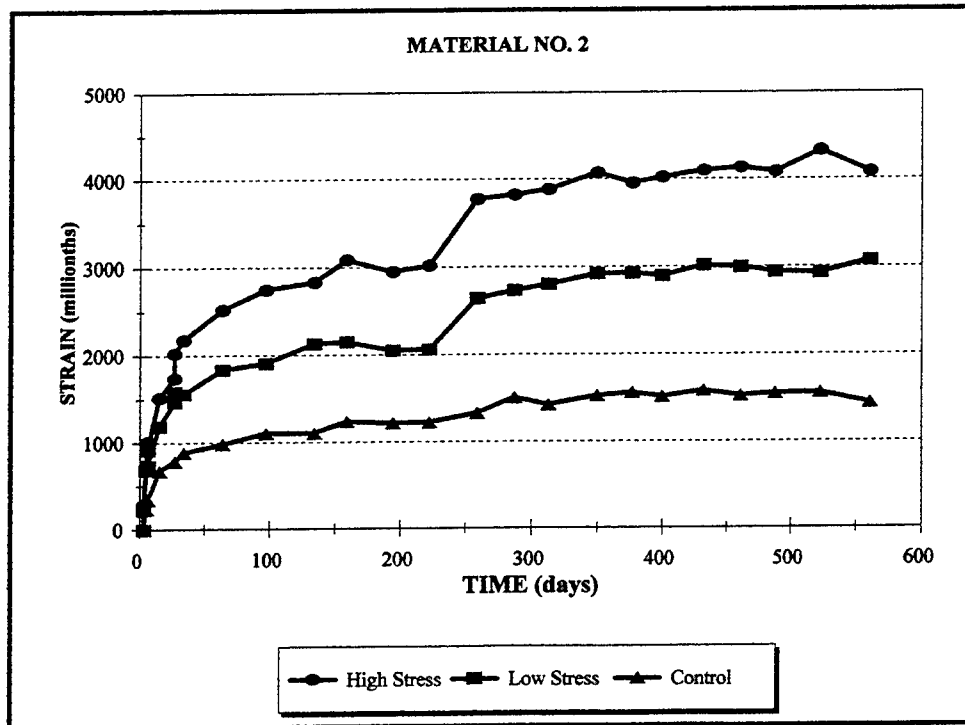


Figure 29. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 2

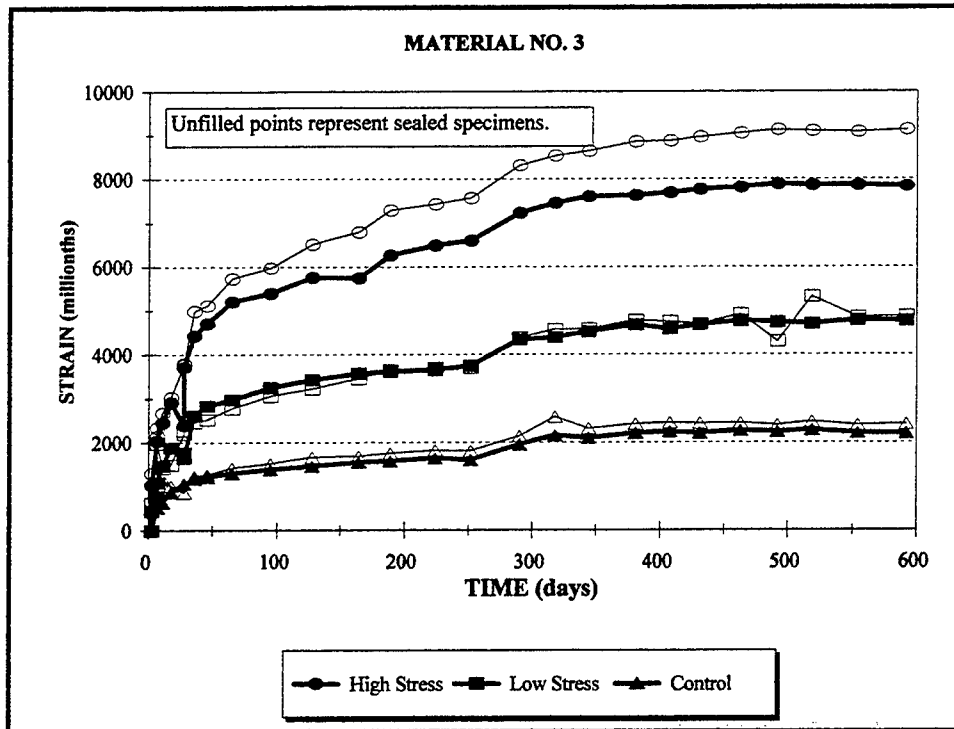


Figure 30. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 3

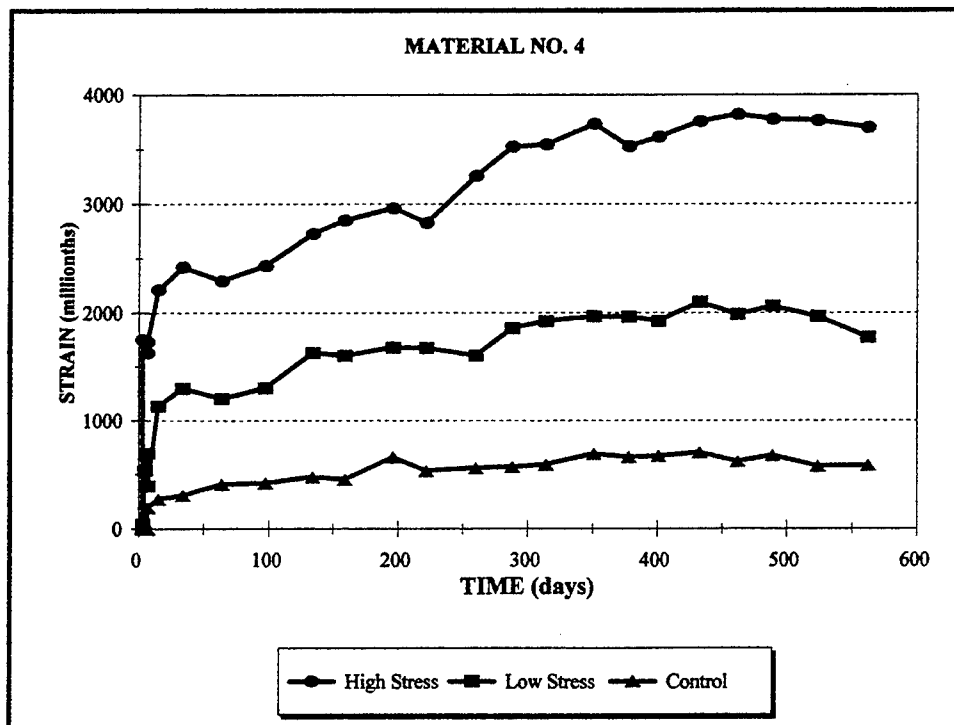


Figure 31. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 4

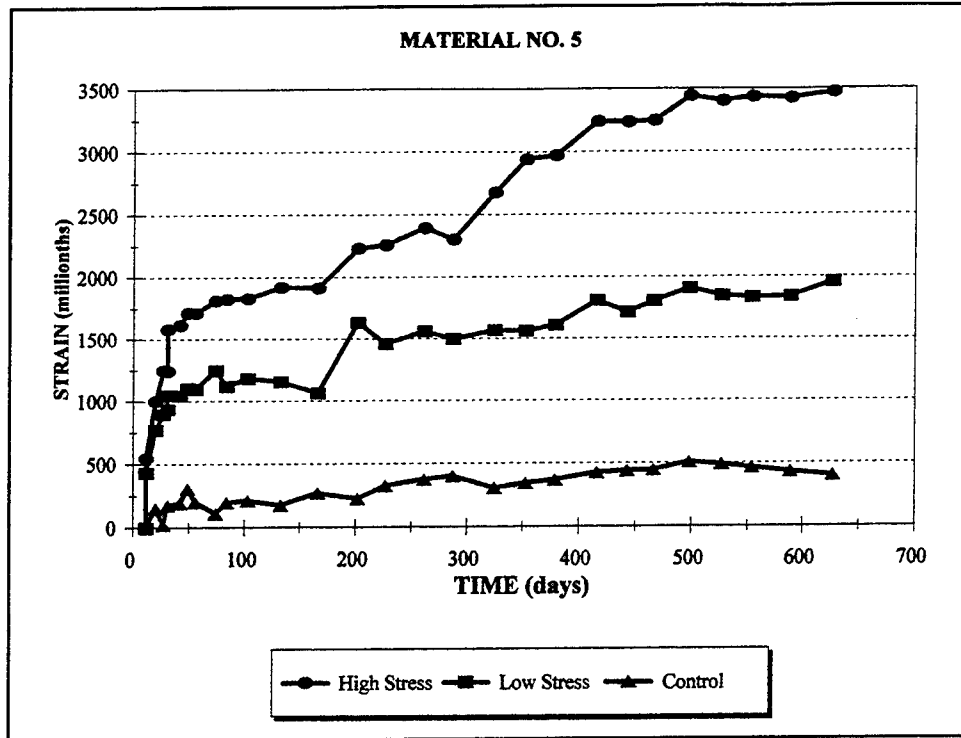


Figure 32. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 5

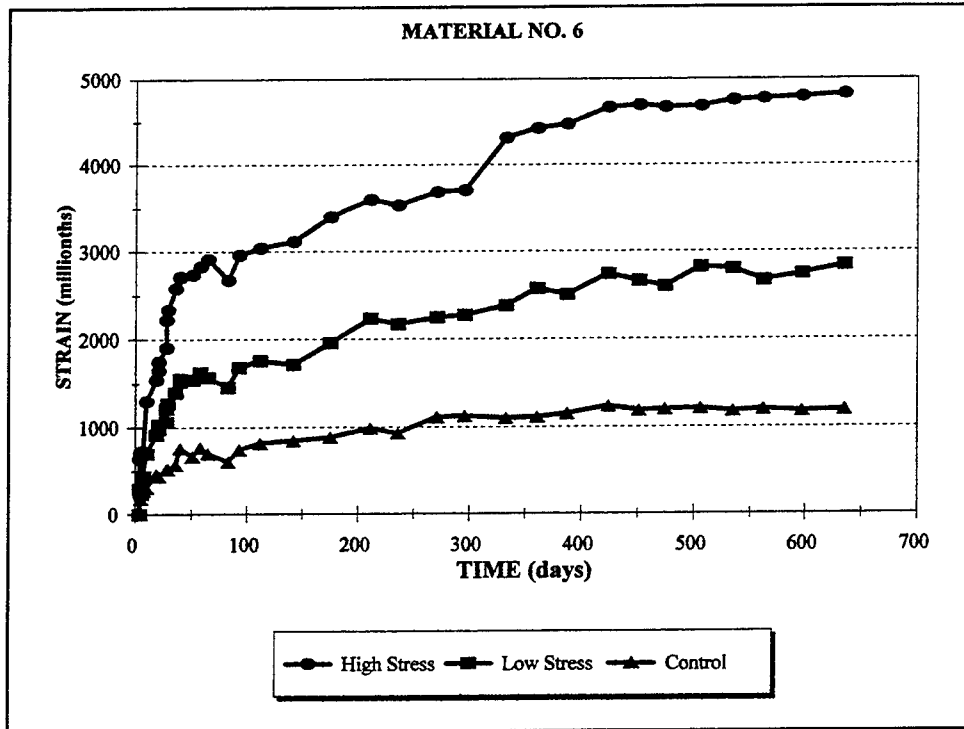


Figure 33. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 6

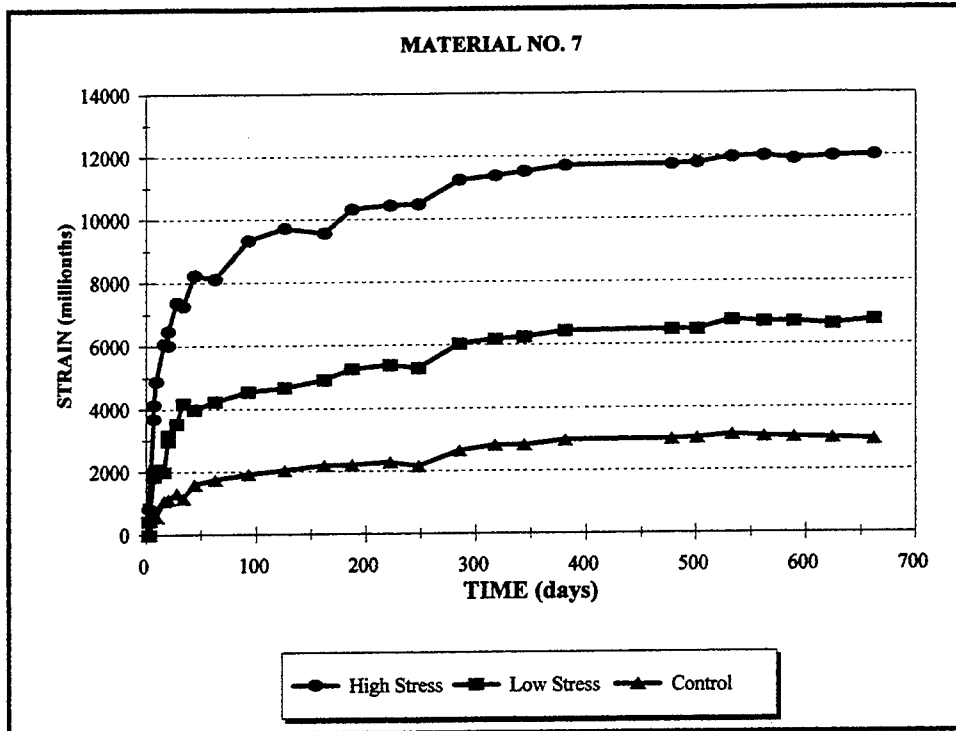


Figure 34. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 7

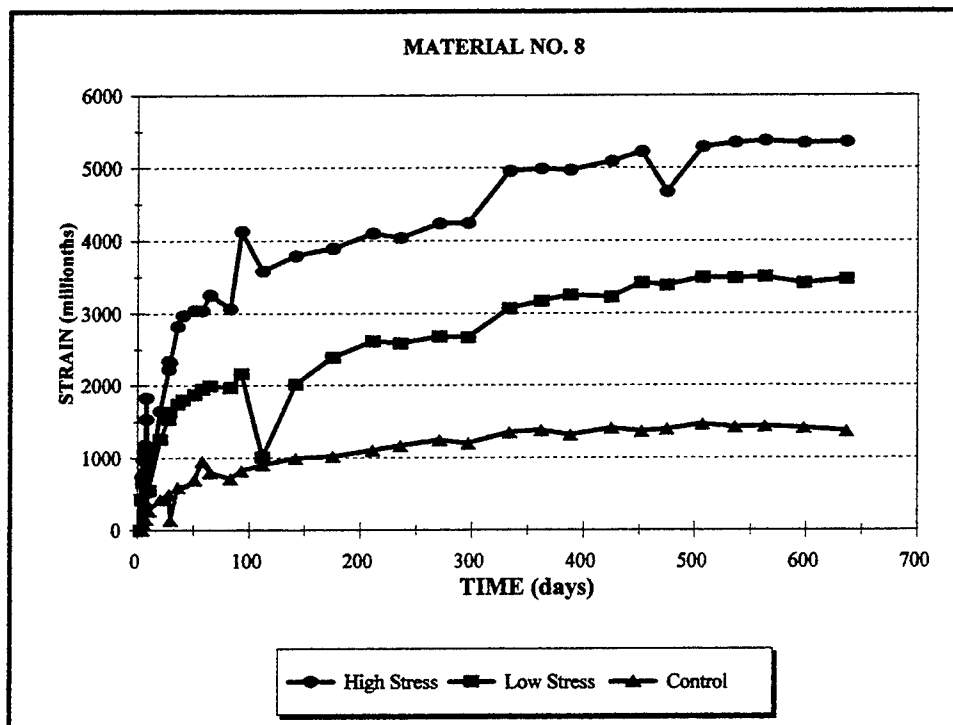


Figure 35. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 8

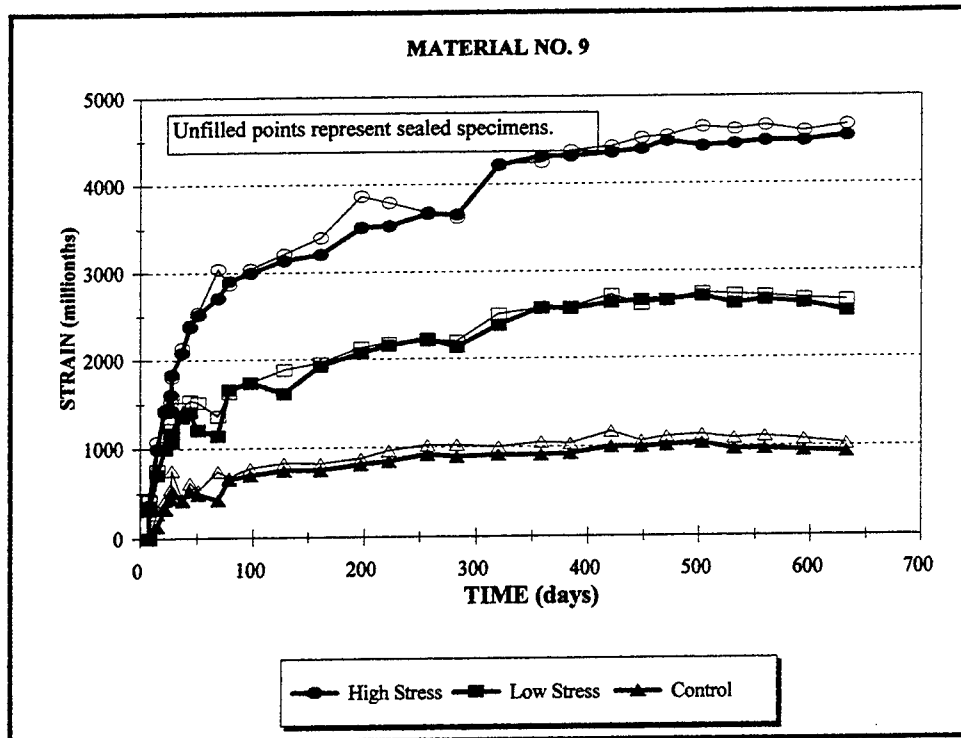


Figure 36. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 9

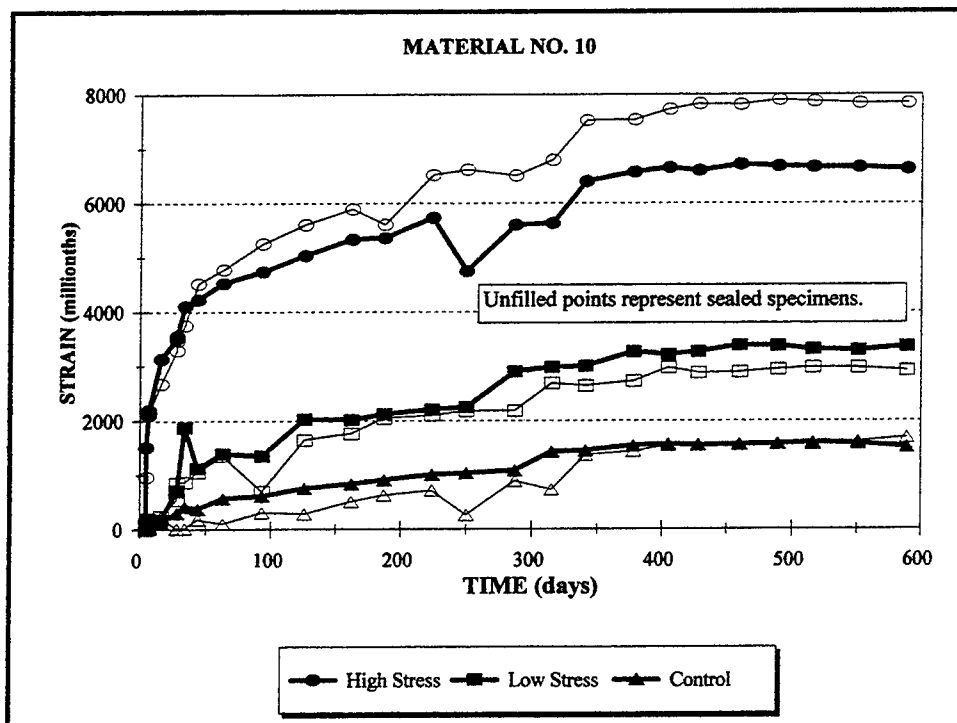


Figure 37. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 10

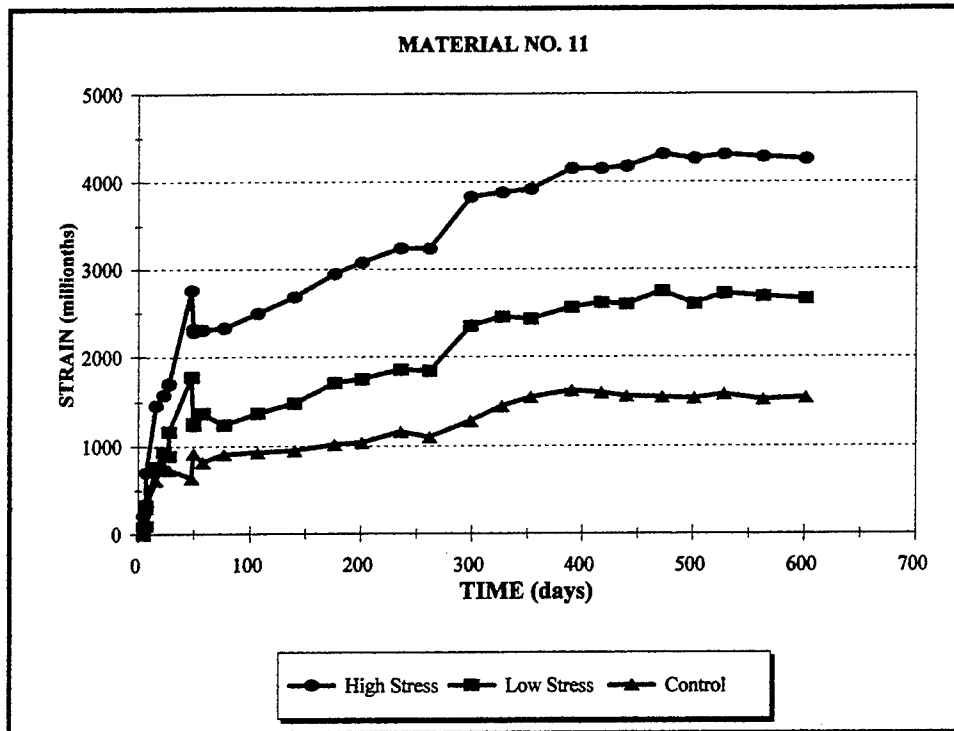


Figure 38. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 11

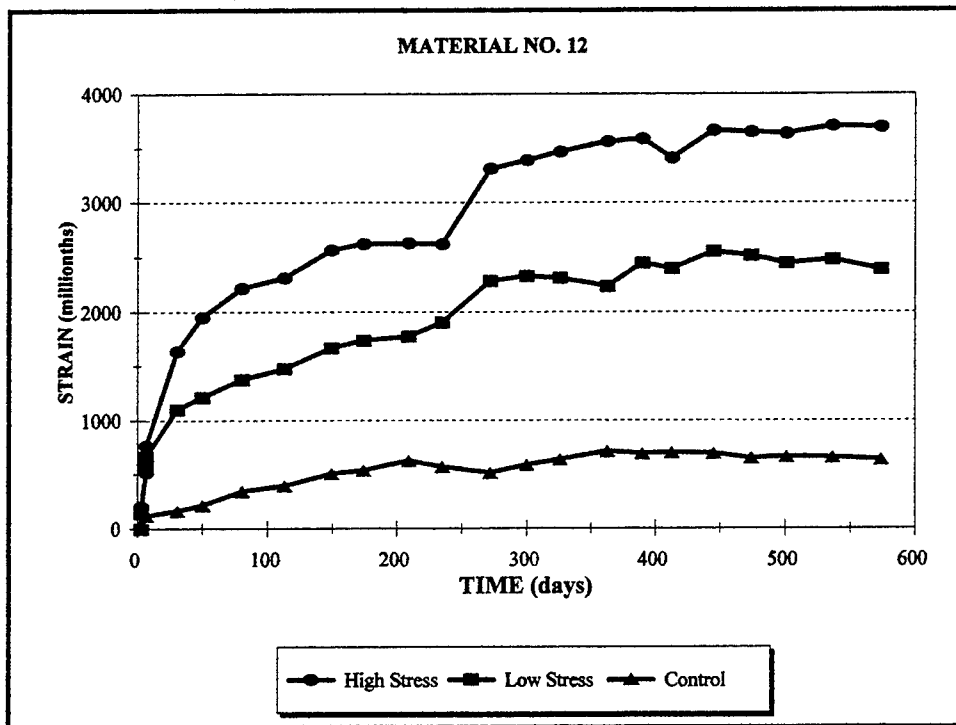


Figure 39. Results of total strain measurements (creep + shrinkage + elastic strain), Material No. 12

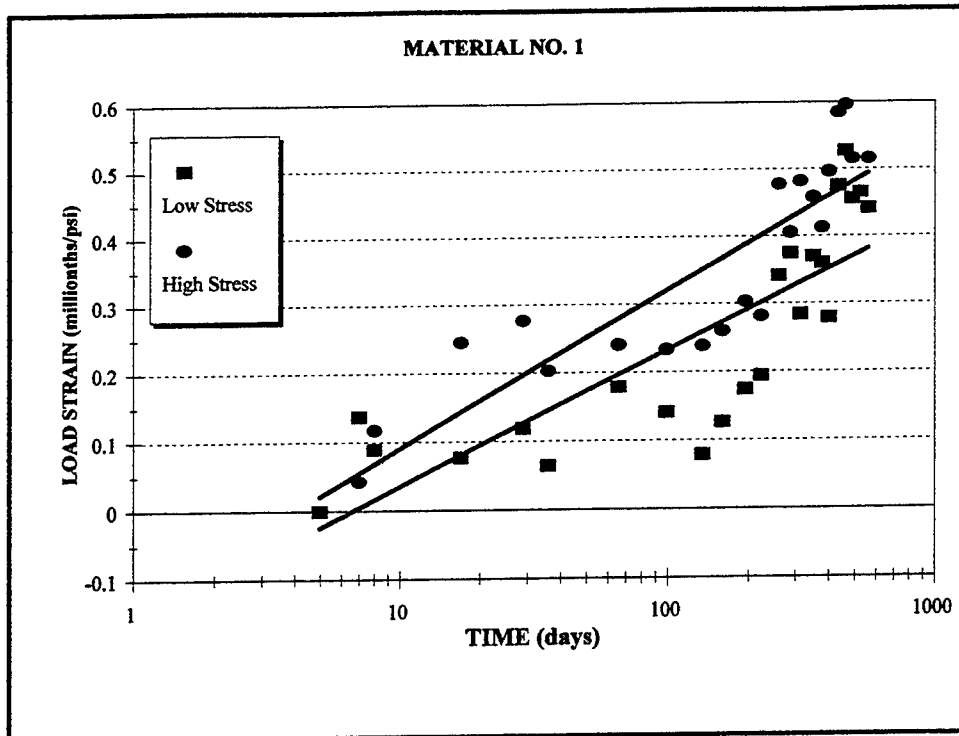


Figure 40. Specific creep strains for Material No. 1 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

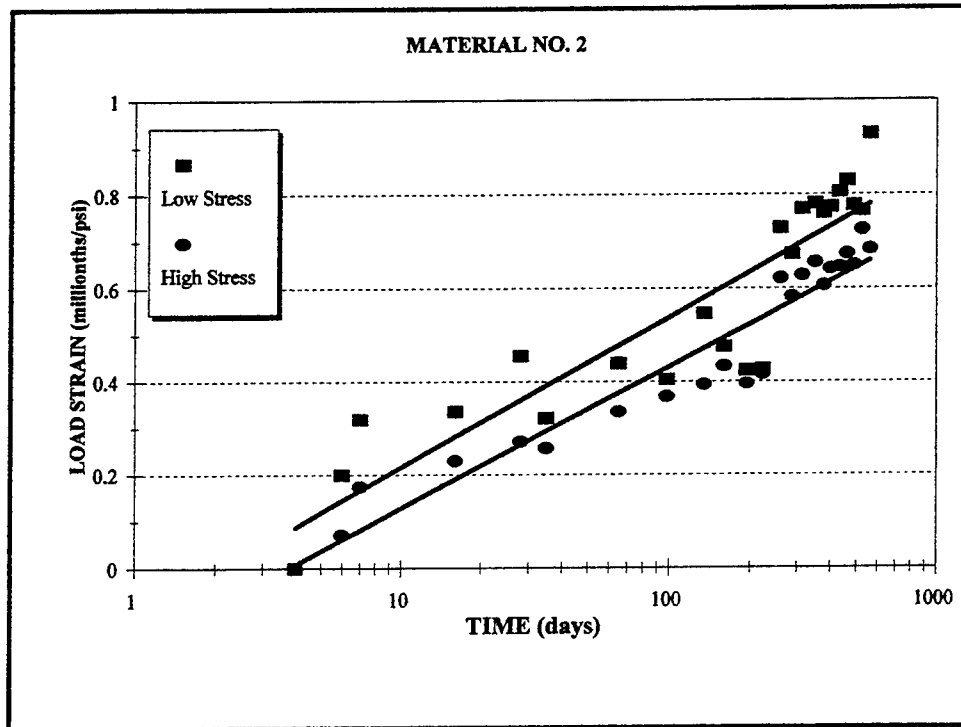


Figure 41. Specific creep strains for Material No. 2 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

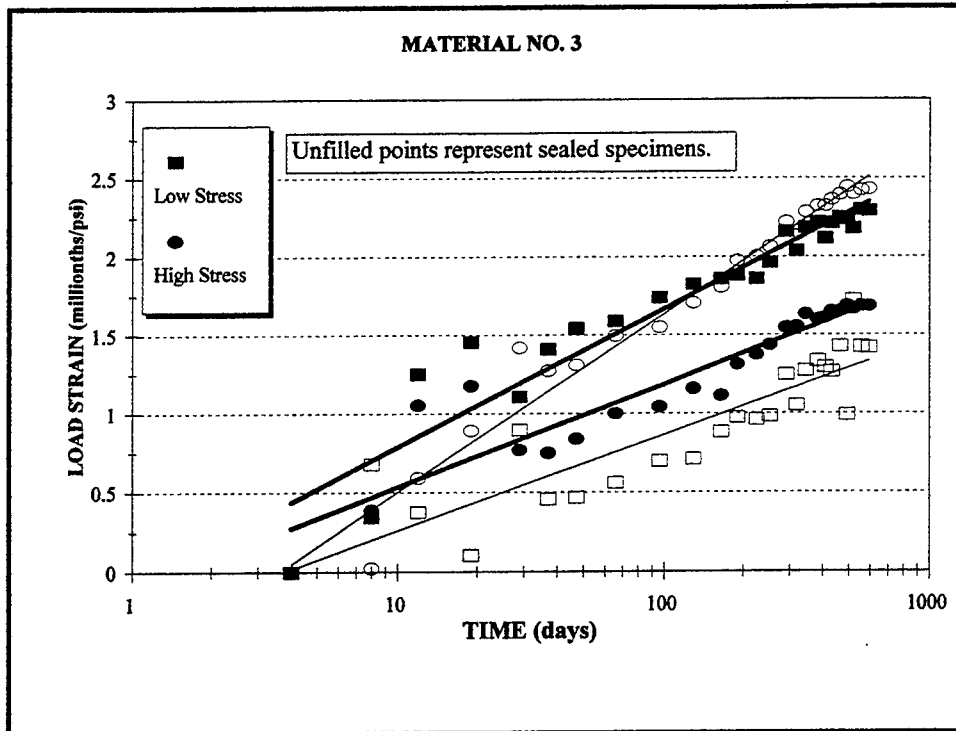


Figure 42. Specific creep strains for Material No. 3 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

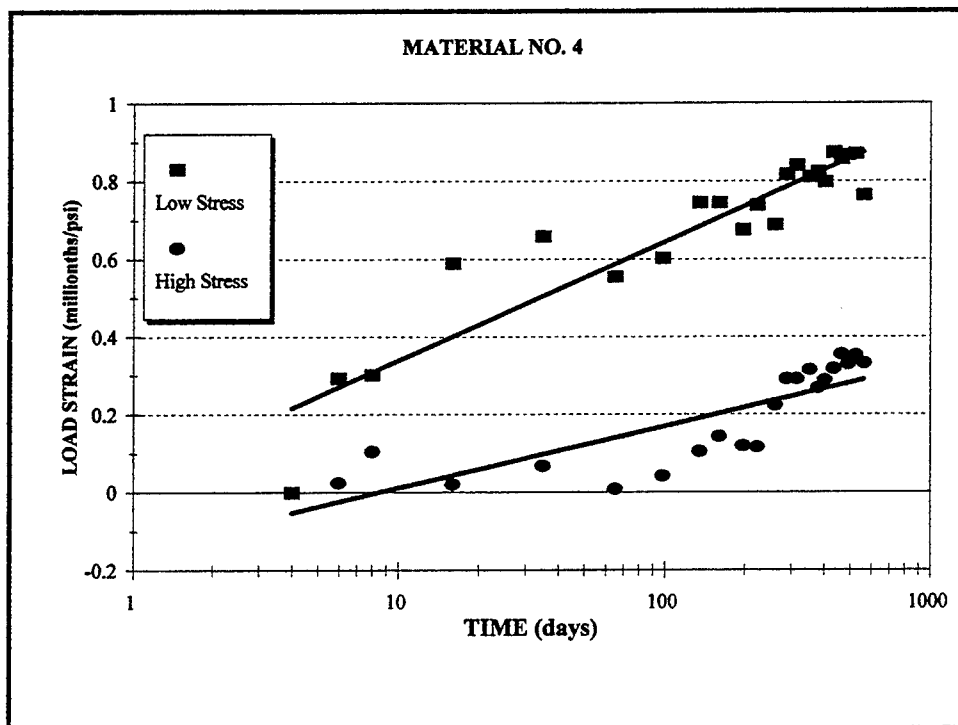


Figure 43. Specific creep strains for Material No. 4 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

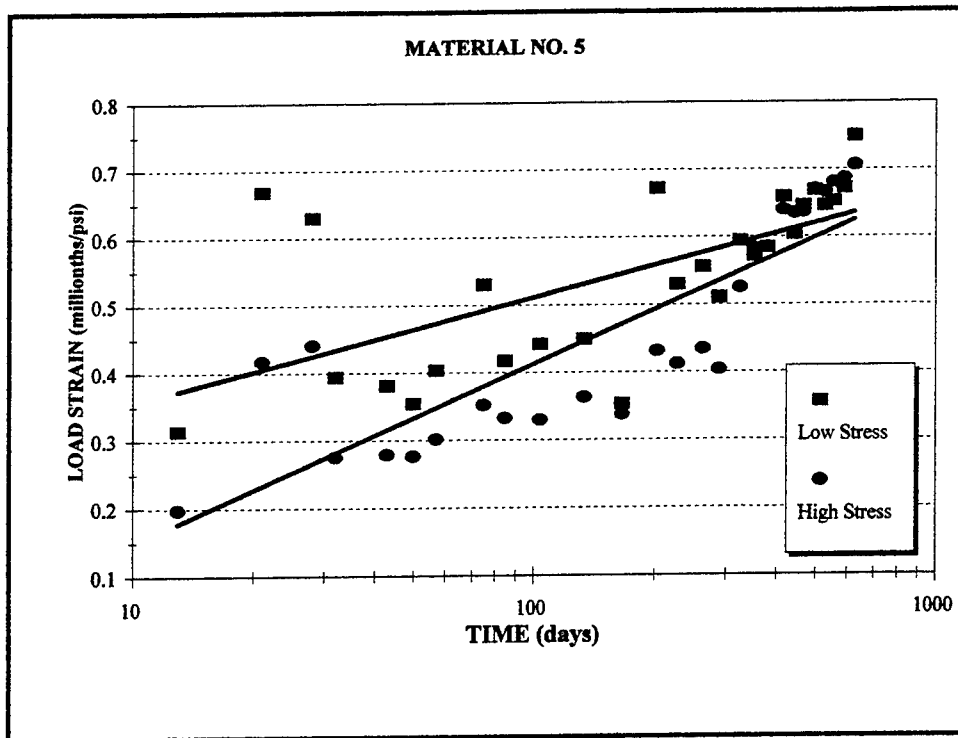


Figure 44. Specific creep strains for Material No. 5 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

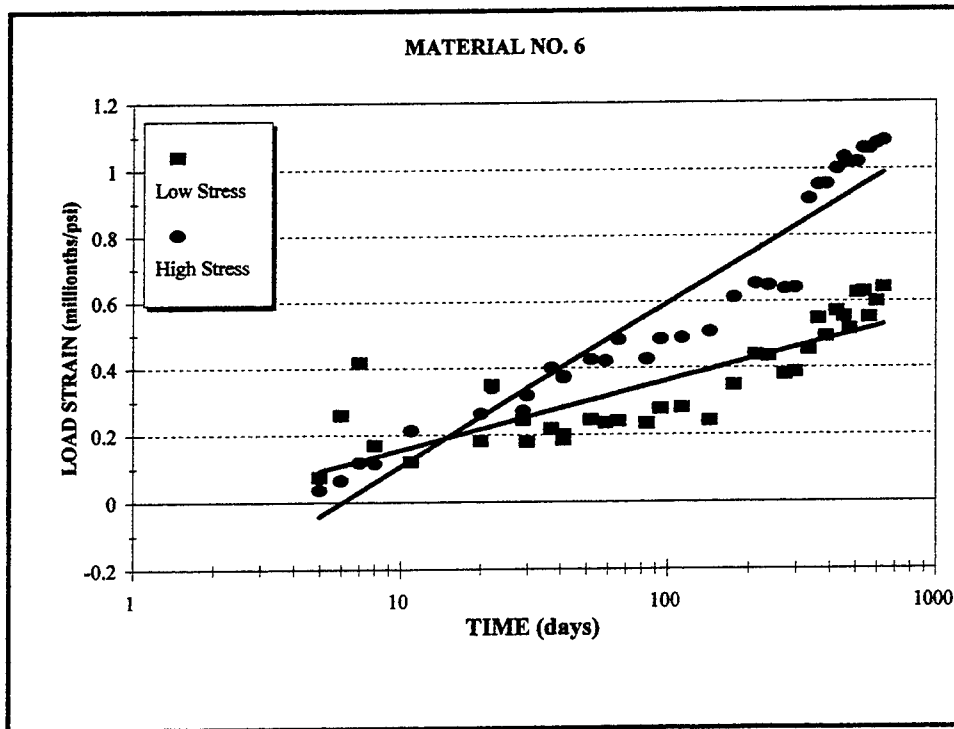


Figure 45. Specific creep strains for Material No. 6 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

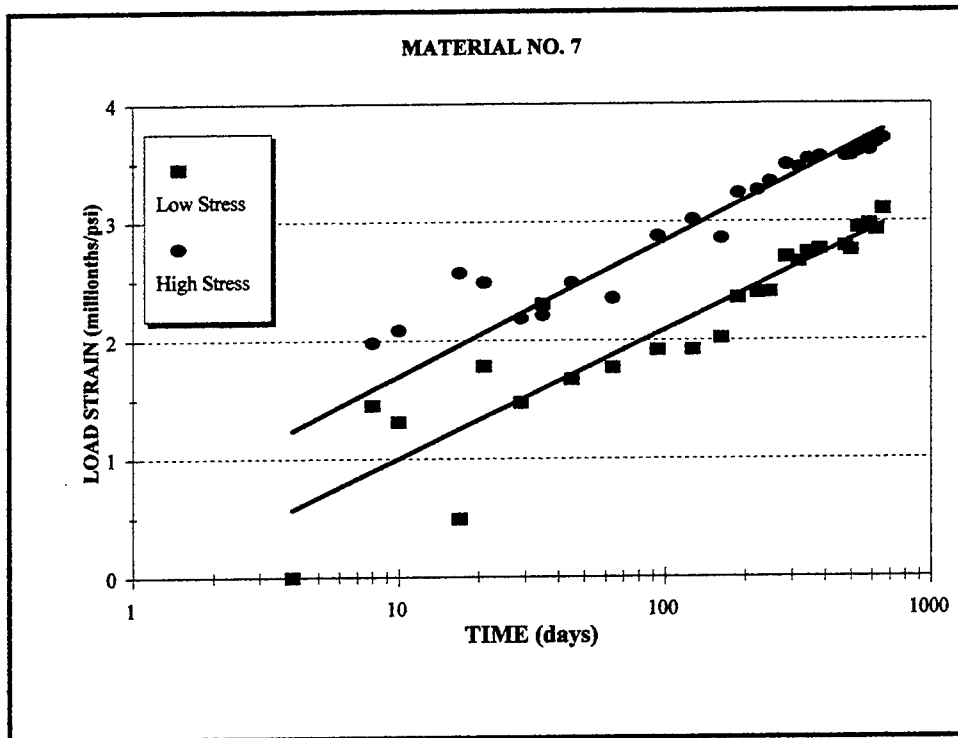


Figure 46. Specific creep strains for Material No. 7 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

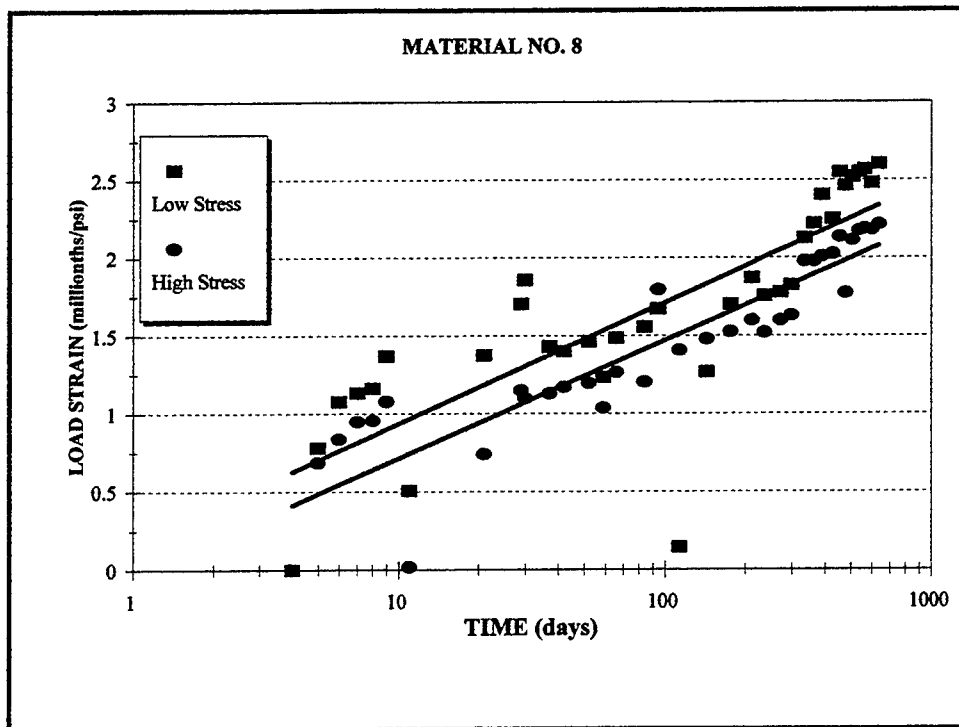


Figure 47. Specific creep strains for Material No. 8 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

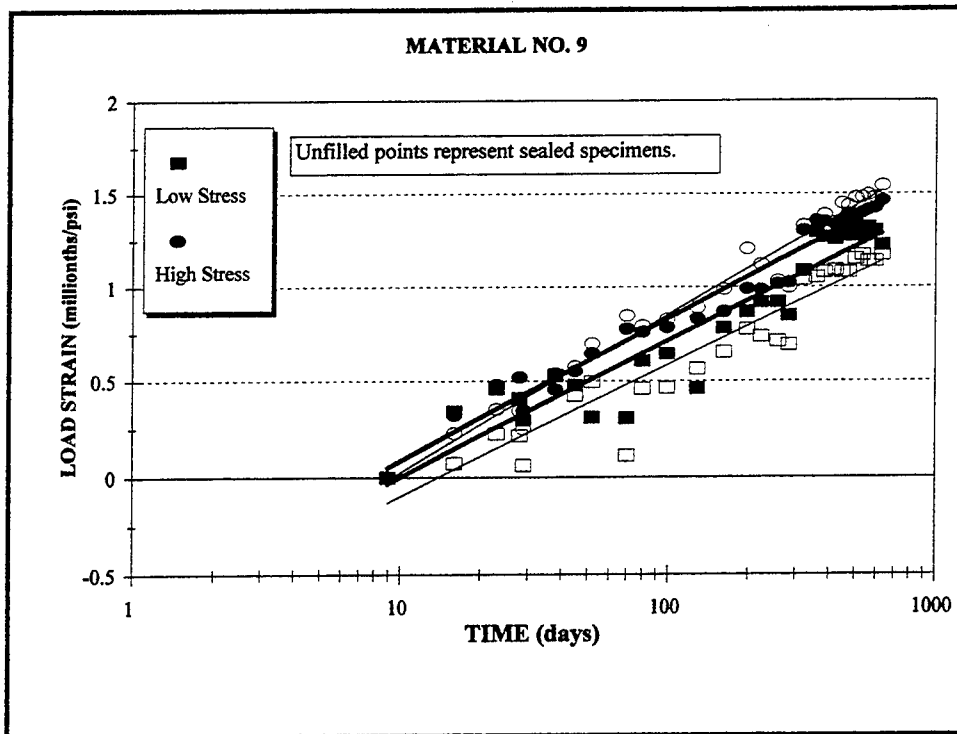


Figure 48. Specific creep strains for Material No. 9 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

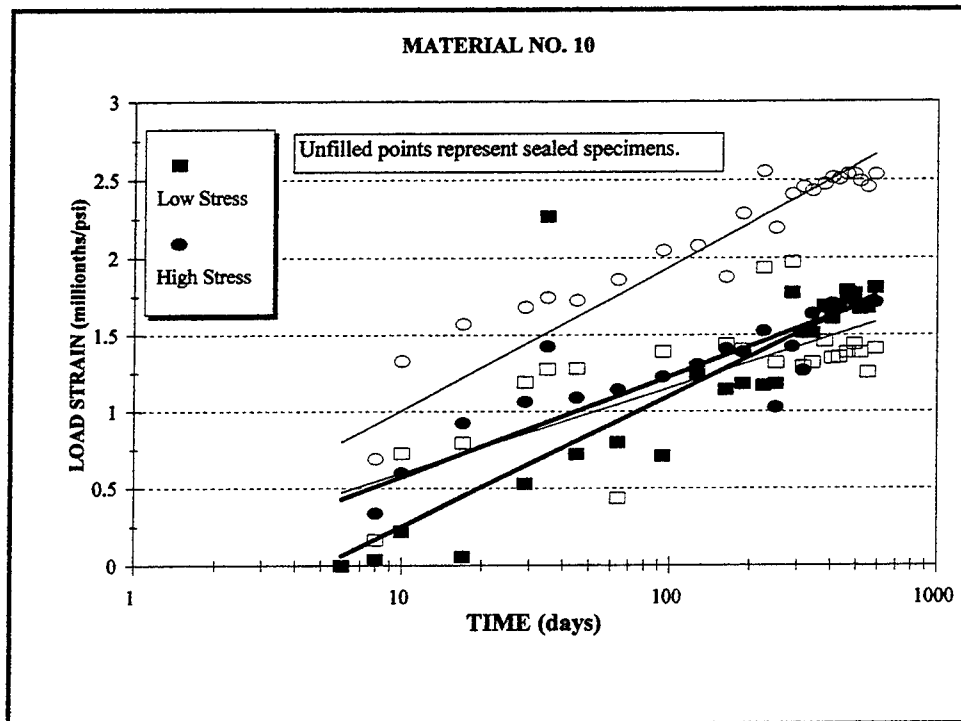


Figure 49. Specific creep strains for Material No. 10 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

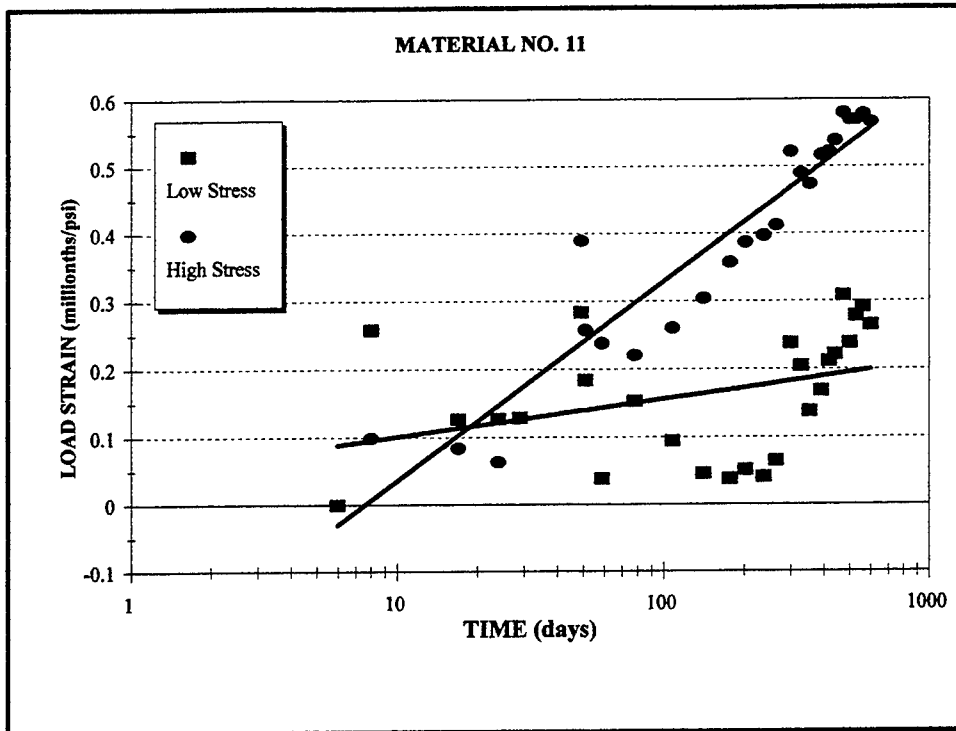


Figure 50. Specific creep strains for Material No. 11 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

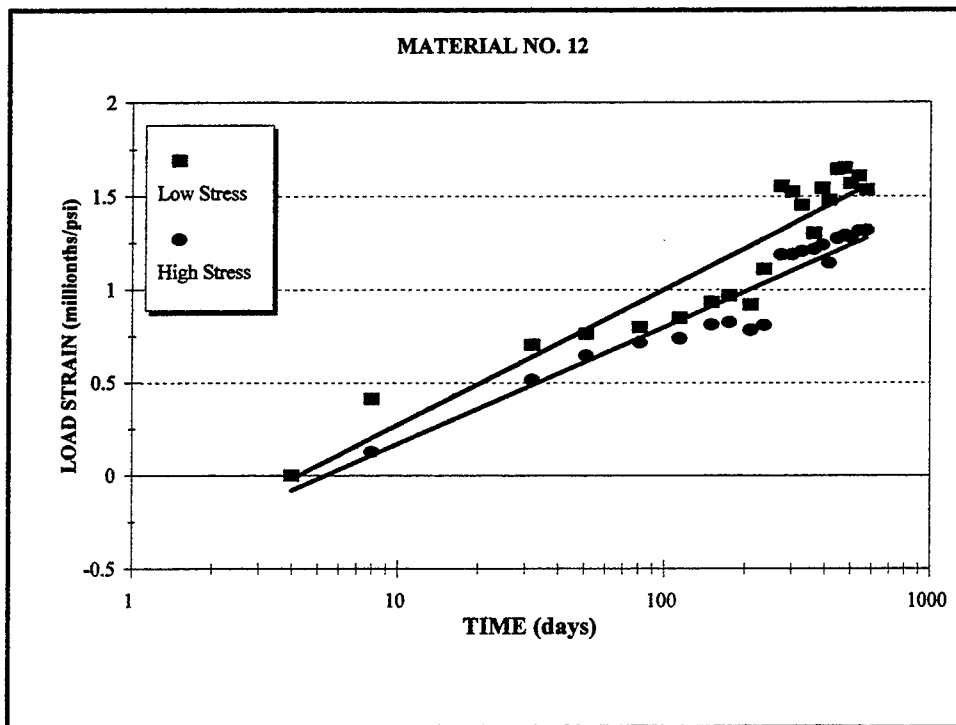


Figure 51. Specific creep strains for Material No. 12 (multiply millionths/psi by 145.0377 to obtain millionths/MPa)

is not known. The specific creep strains ranged from 37.7 to 505.5 millionths/MPa (0.260 to 3.485 millionths/psi) for the nominal 40 percent sustained stress case.

Tensile Creep

A nominal sustained tensile stress of 40 percent of the 3-day tensile strength was applied to the specimens at 3 days. The load generally changed with increased tensile strength gain at 7 and 28 days. Again, due to scheduling conflicts, this regime of 3, 7, and 28 days sometimes varied. The load was kept constant after 28 days. Elastic strains were measured following application of the load and changes in load. Strains were measured regularly over the 8-month test period. During the test period, strain measurements were also made on unloaded control beams of the same size and volume to surface area ratio.

Results from the strain measurements taken during the tensile creep tests are shown in Figures 52 through 63. The tensile creep graphs shown in these figures were calculated by subtracting measured elastic strains and drying shrinkage strain measured in the unloaded control specimens from the total measured strain.

Specific creep strains for each material were calculated by dividing the creep strains by the applied load stress. A best-fit line was then determined. Results are shown in Figures 64 to 75. Using this best-fit line, the specific creep projected to 1 year was determined. Table 12 summarizes the projected specific creep values at 1 year for each material. Specific creep values vary considerably depending on material. As has been reported for other test data, Material No. 5 exhibited highly unusual and unexpected behavior that is not understood. The tensile creep specimens for Material No. 5 experienced delayed failures.

Time delayed failures occurred for Materials No. 5, 7, 8, 10, and 12 at nominal applied stress levels of 40 percent of tensile strength. Specimen No. 1 of Material No. 5 failed at 49 days. Specimen No. 2 failed at 72 days. No recasting was done because the failure occurred well into the evaluation program.

Material No. 7 failed at 7 days. Specimens were recast and no delayed failure reoccurred. Materials No. 8, 10, and 12 failed at 7, 10, and 7 days, respectively. Specimens were recast and delayed failures occurred once again at 9, 7, and 28 days, respectively. Specimens were recast for a third time, but the applied tensile load was reduced to 20 percent of the tensile strength. At this load level, no time delayed failures occurred. This phenomenon strongly suggests that there is a discontinuity point for concrete in tension analogous to that observed for concrete in compression. This phenomenon is believed to be previously uncited in the literature.

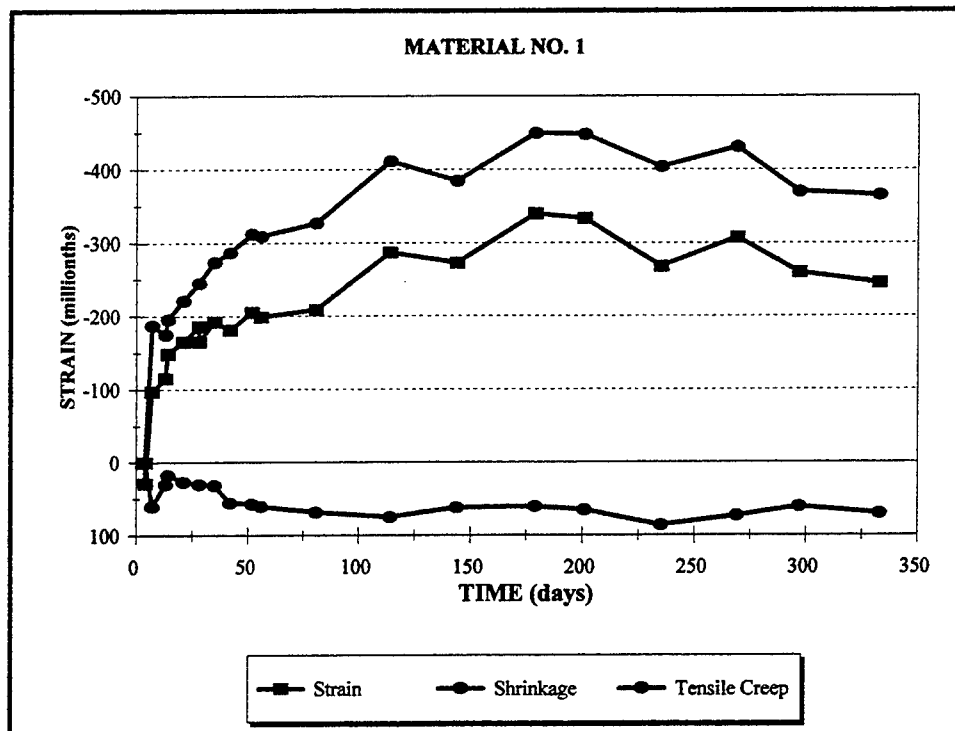


Figure 52. Results of tensile creep measurements, Material No. 1

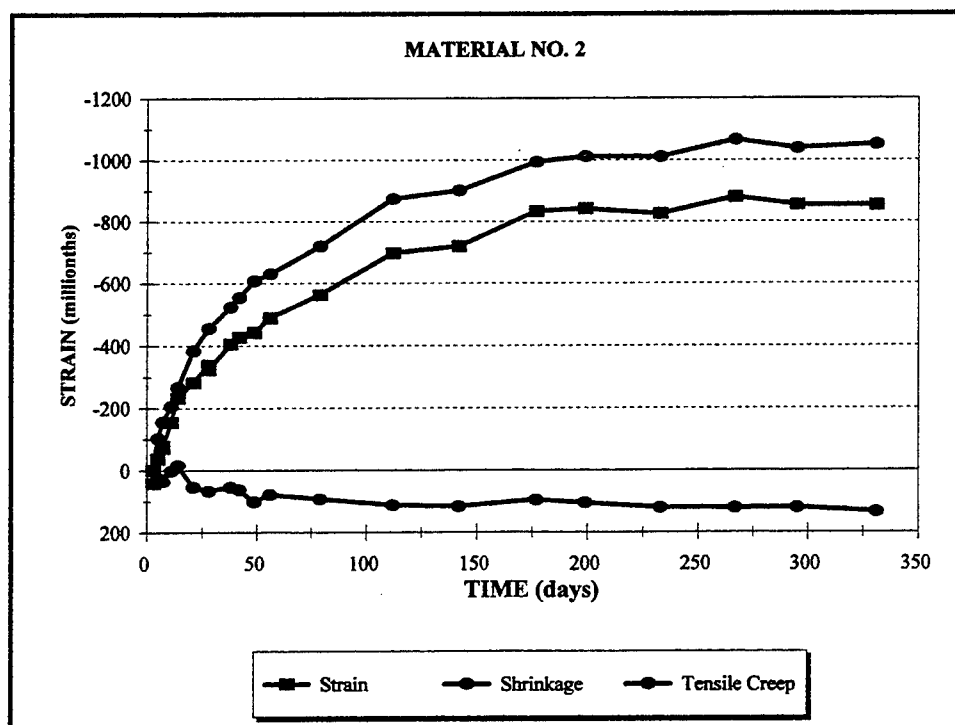


Figure 53. Results of tensile creep measurements, Material No. 2

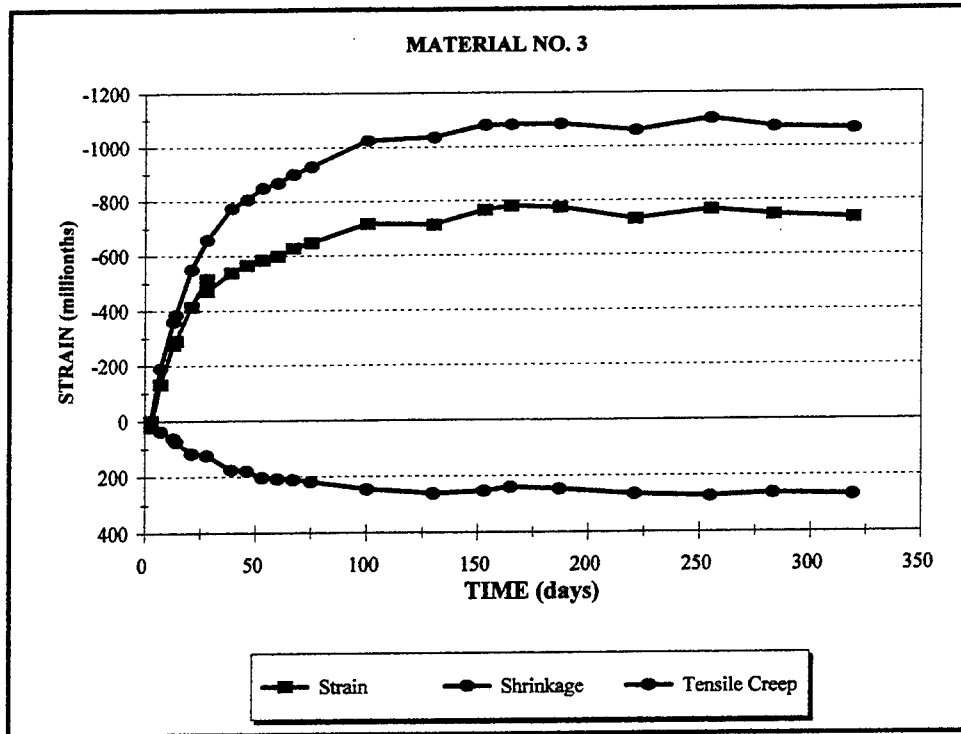


Figure 54. Results of tensile creep measurements, Material No. 3

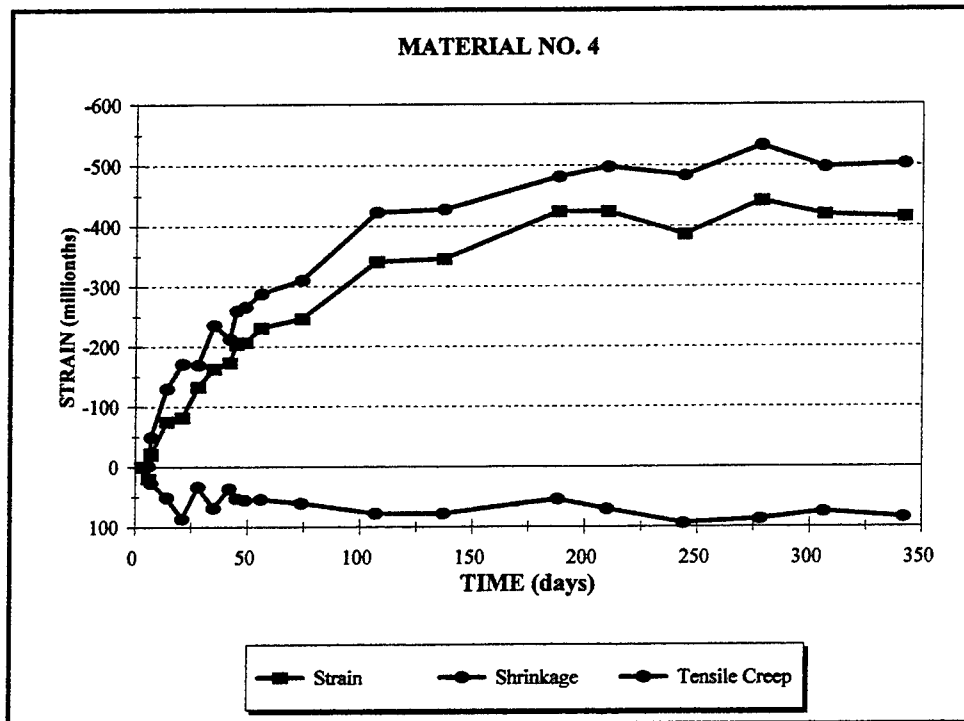


Figure 55. Results of tensile creep measurements, Material No. 4

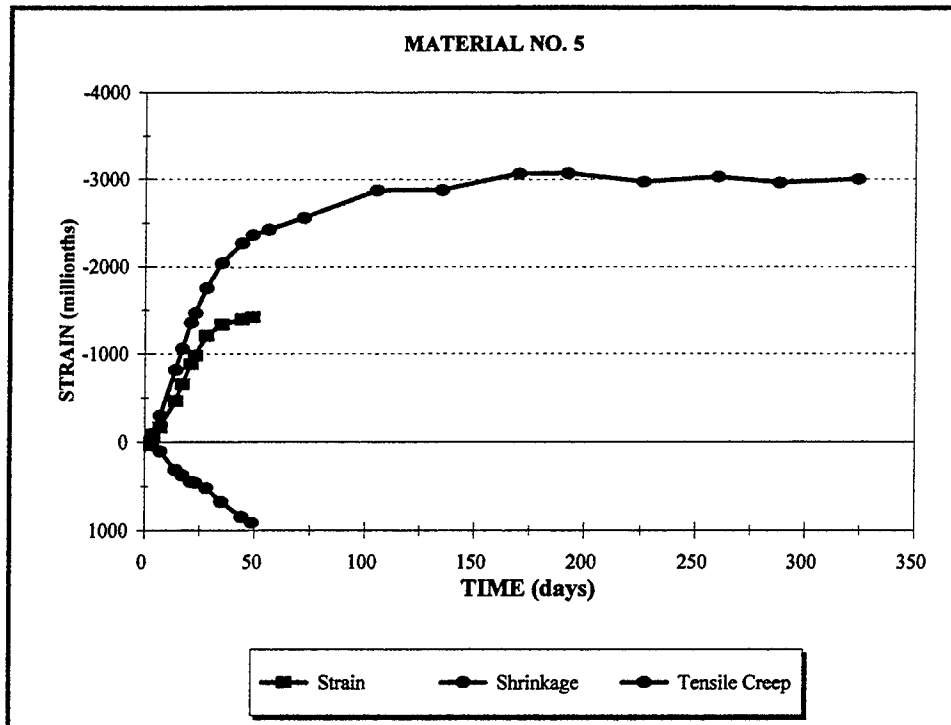


Figure 56. Results of tensile creep measurements, Material No. 5

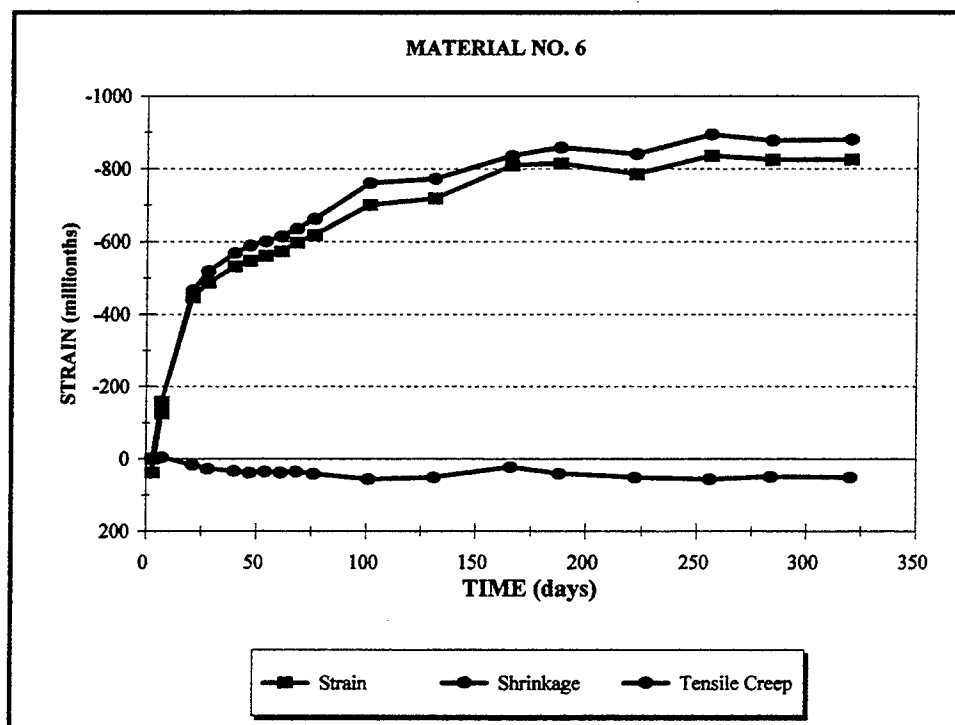
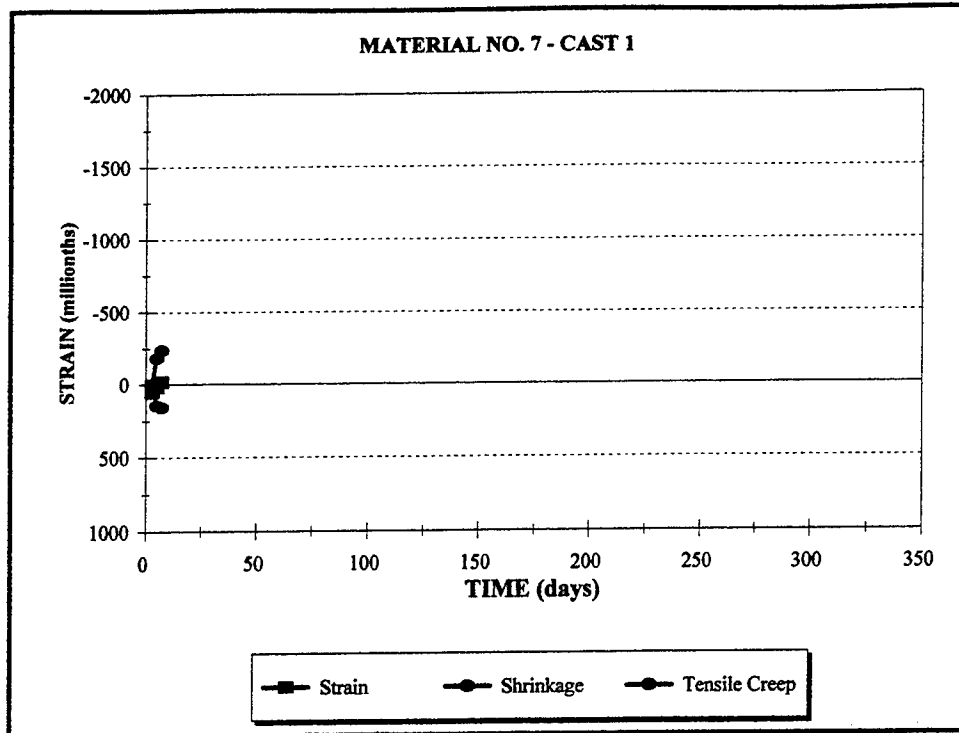
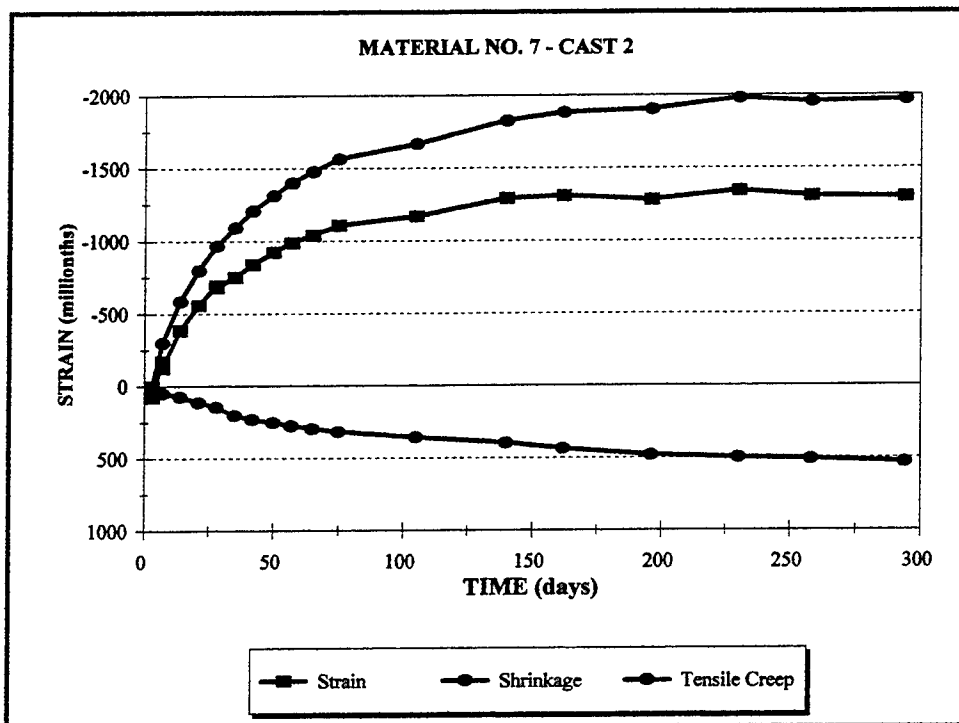


Figure 57. Results of tensile creep measurements, Material No. 6

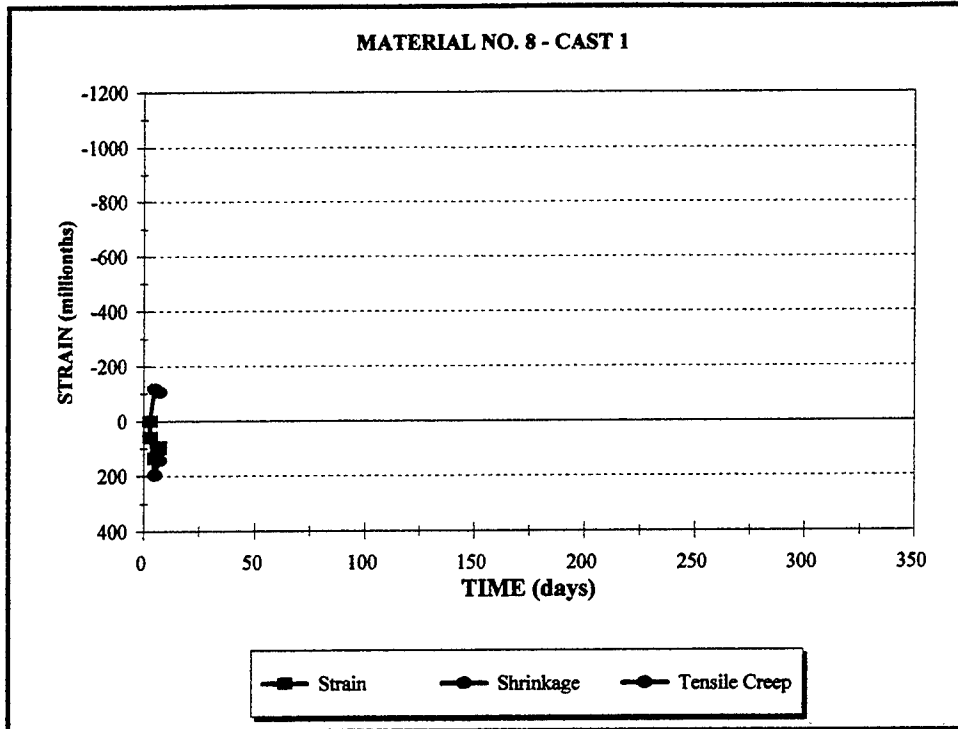


a. Cast 1

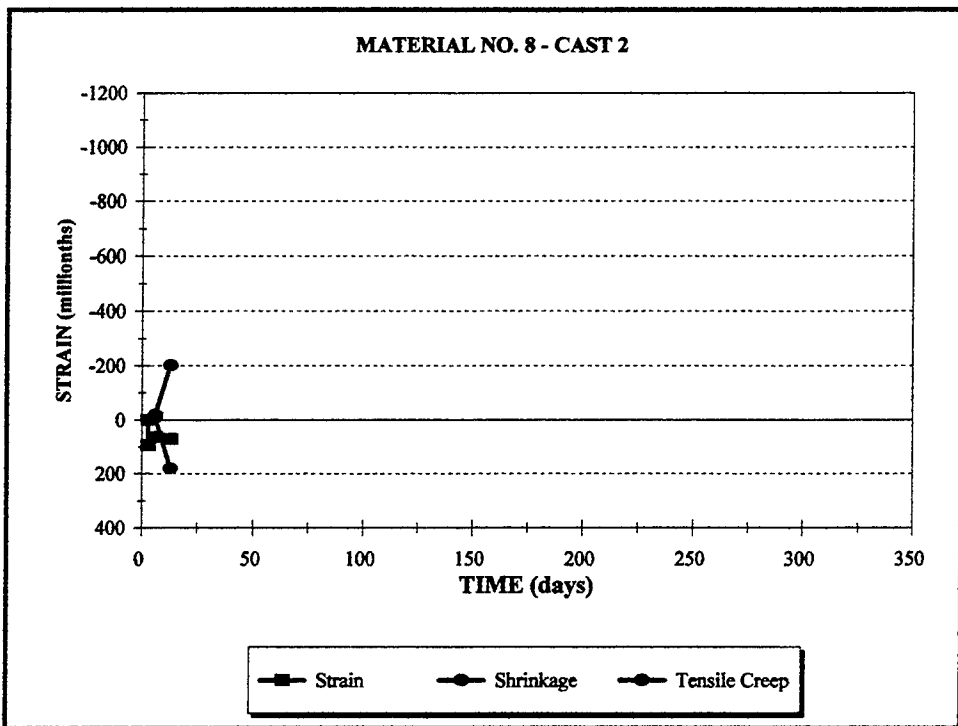


b. Cast 2

Figure 58. Results of tensile creep measurements, Material No. 7

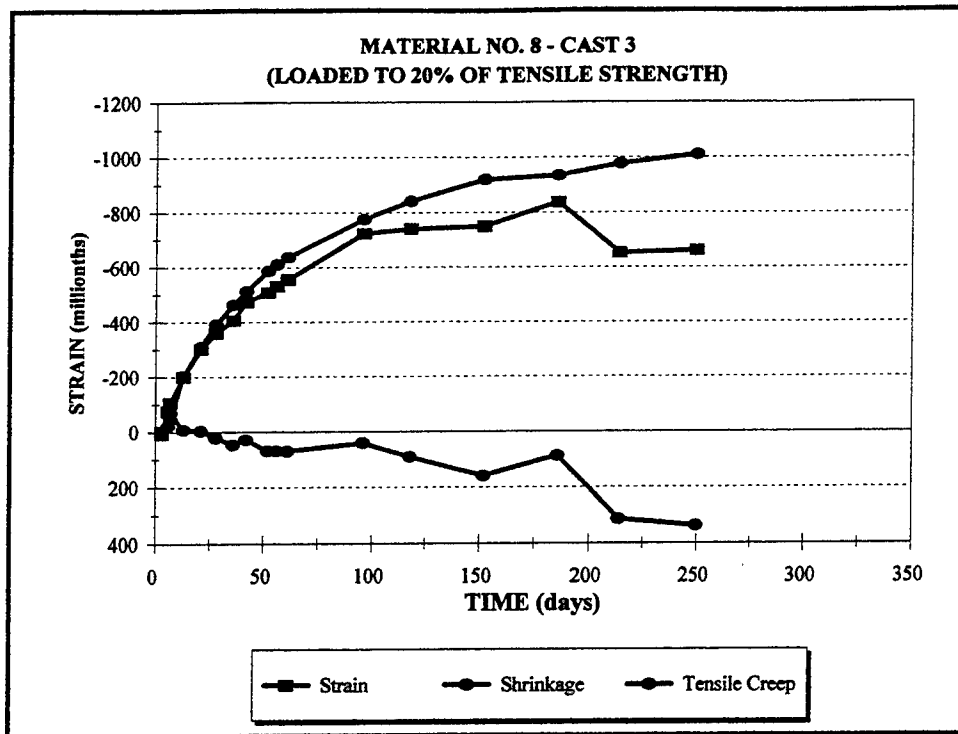


a. Cast 1



b. Cast 2

Figure 59. Results of tensile creep measurements, Material No. 8
(Continued)



c. Cast 3

Figure 59. (Concluded)

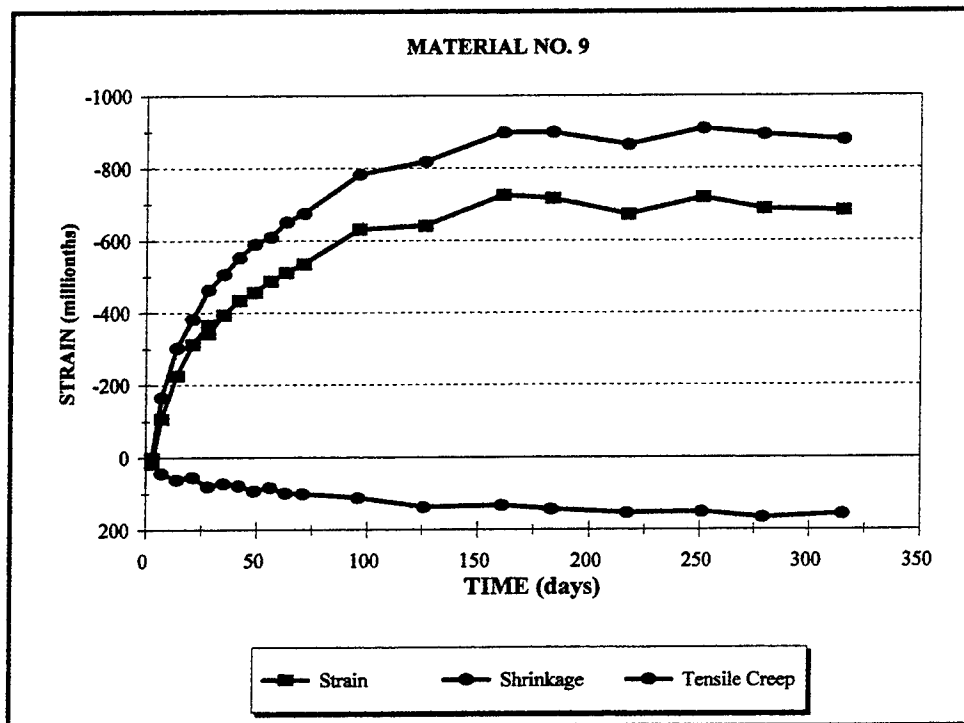
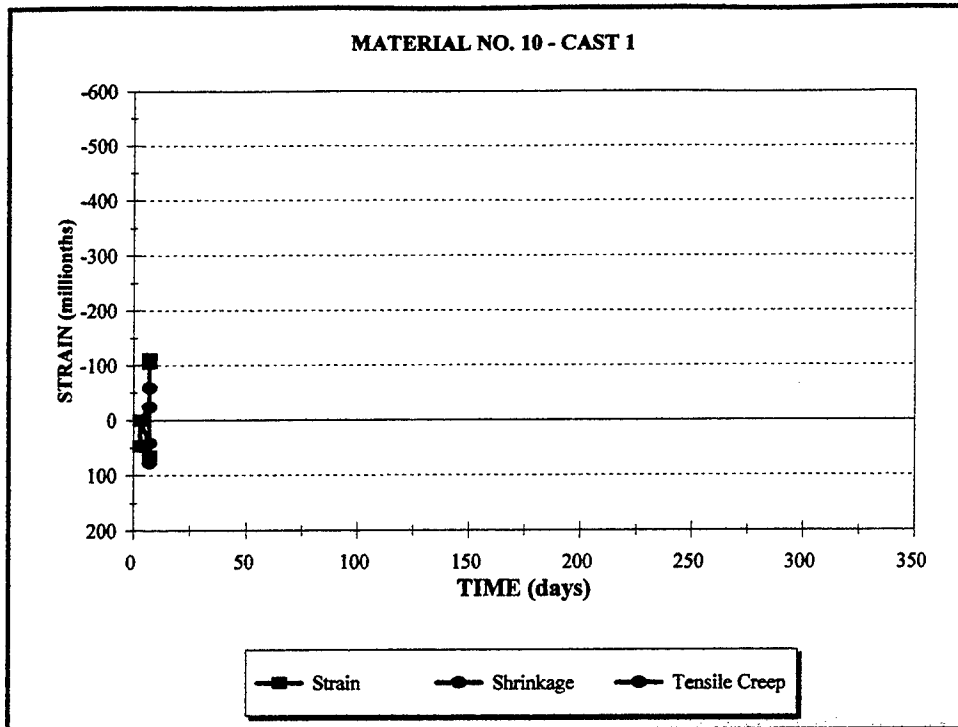
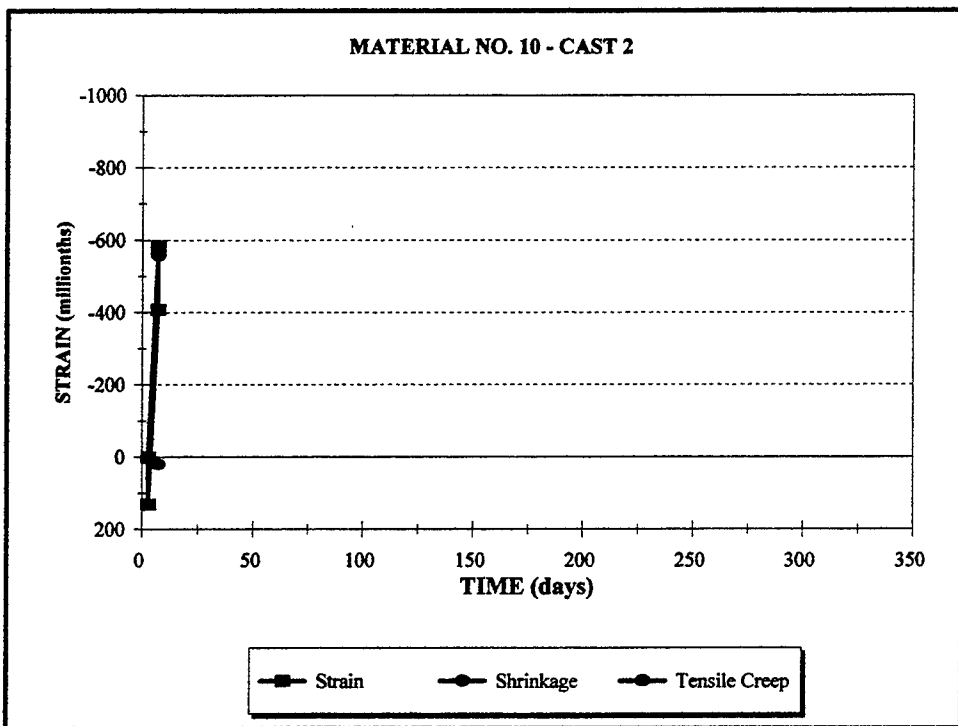


Figure 60. Results of tensile creep measurements, Material No. 9

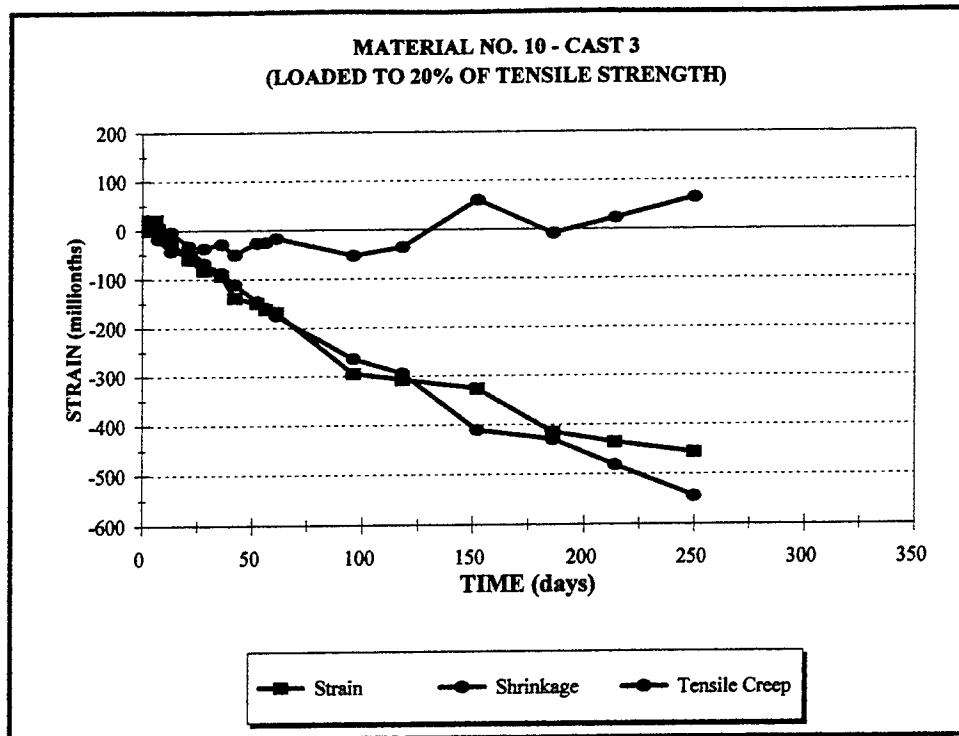


a. Cast 1



b. Cast 2

Figure 61. Results of tensile creep measurements, Material No. 10
(Continued)



c. Cast 3

Figure 61. (Concluded)

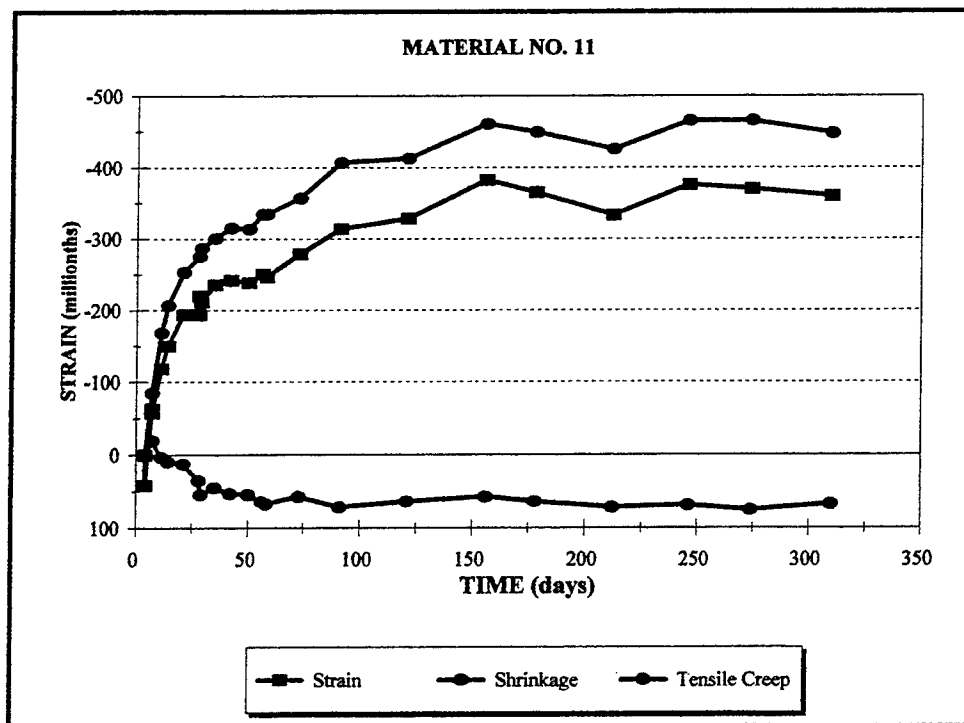
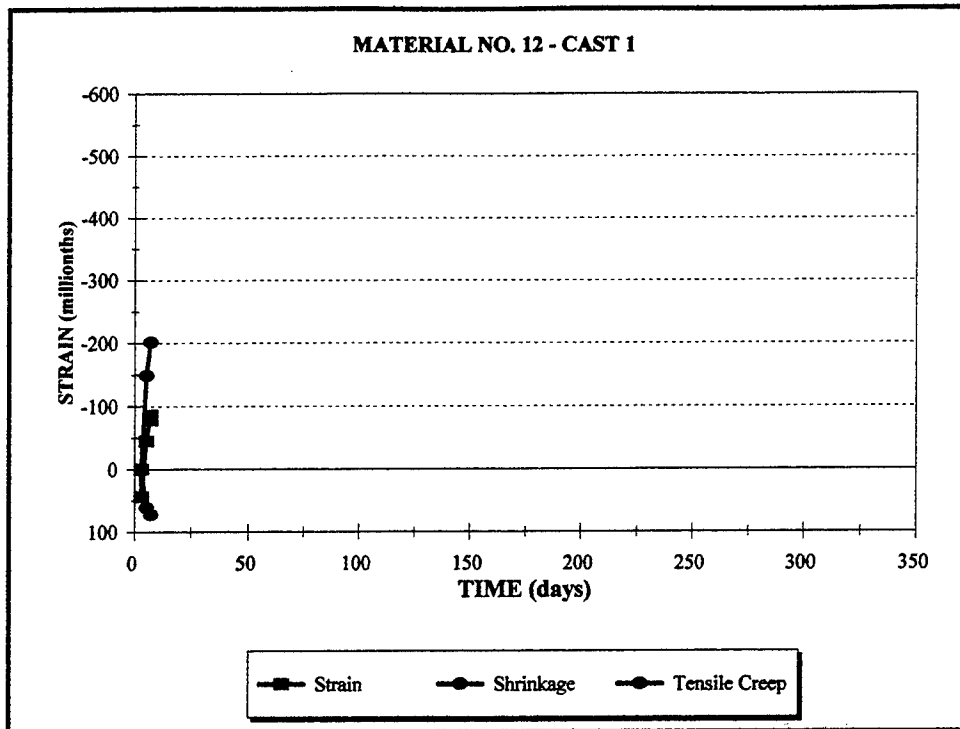
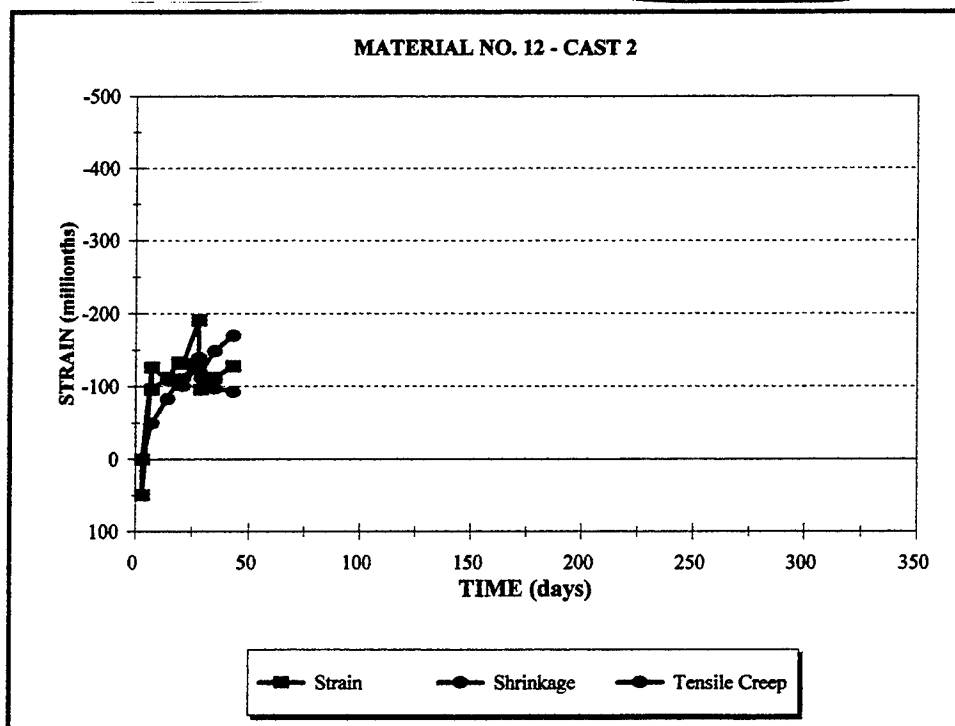


Figure 62. Results of tensile creep measurements, Material No. 11

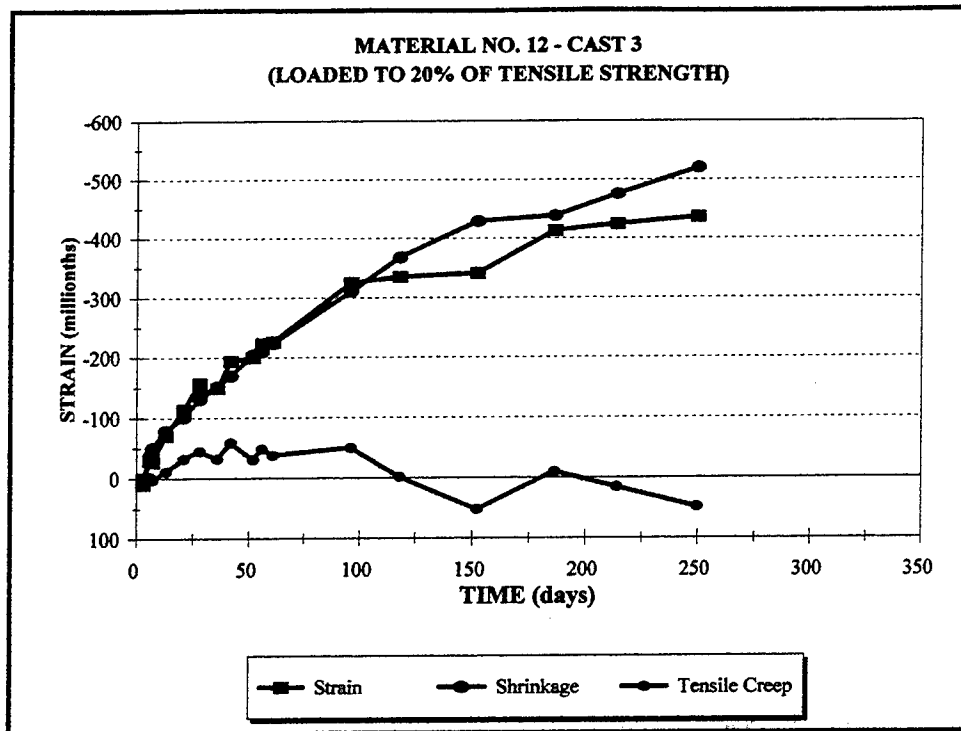


a. Cast 1



b. Cast 2

Figure 63. Results of tensile creep measurements, Material No. 12
(Continued)



c. Cast 3

Figure 63. (Concluded)

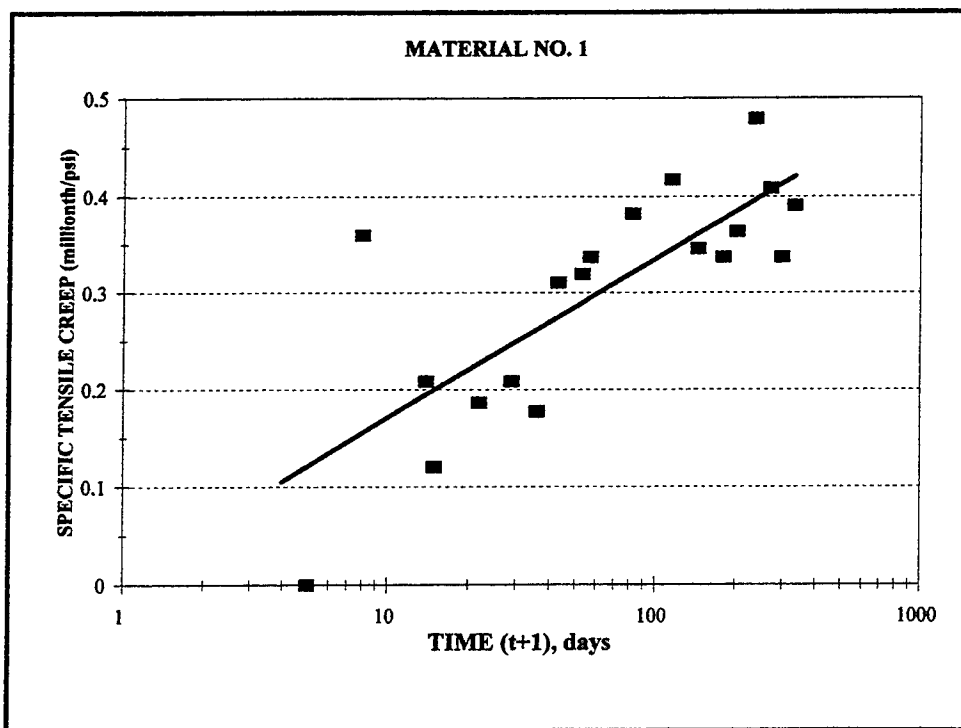


Figure 64. Specific tensile creep for Material No. 1 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

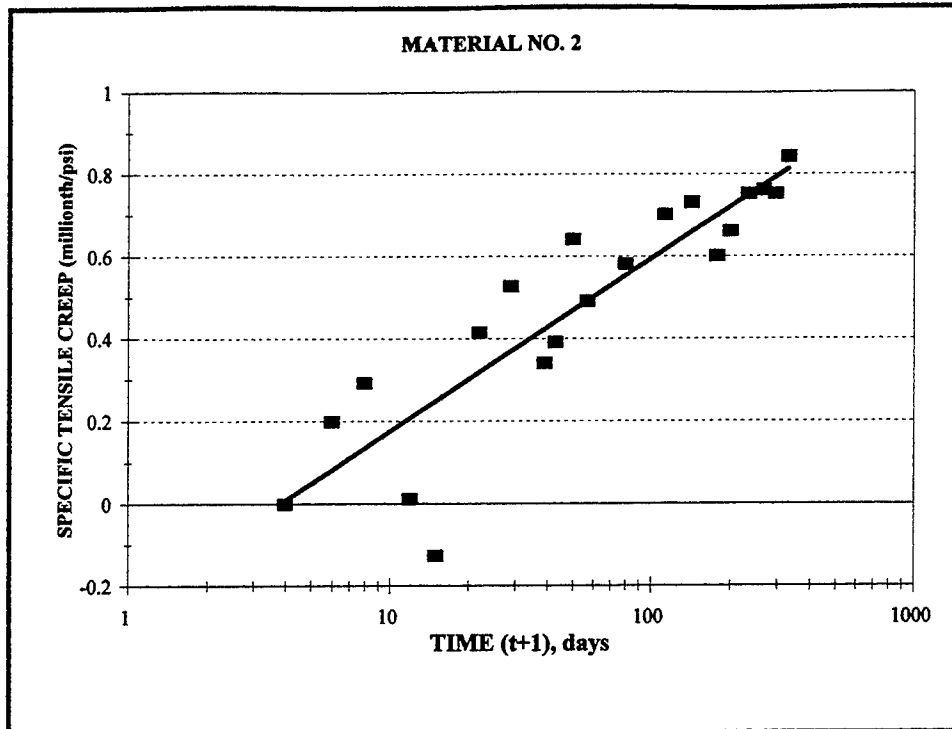


Figure 65. Specific tensile creep for Material No. 2 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

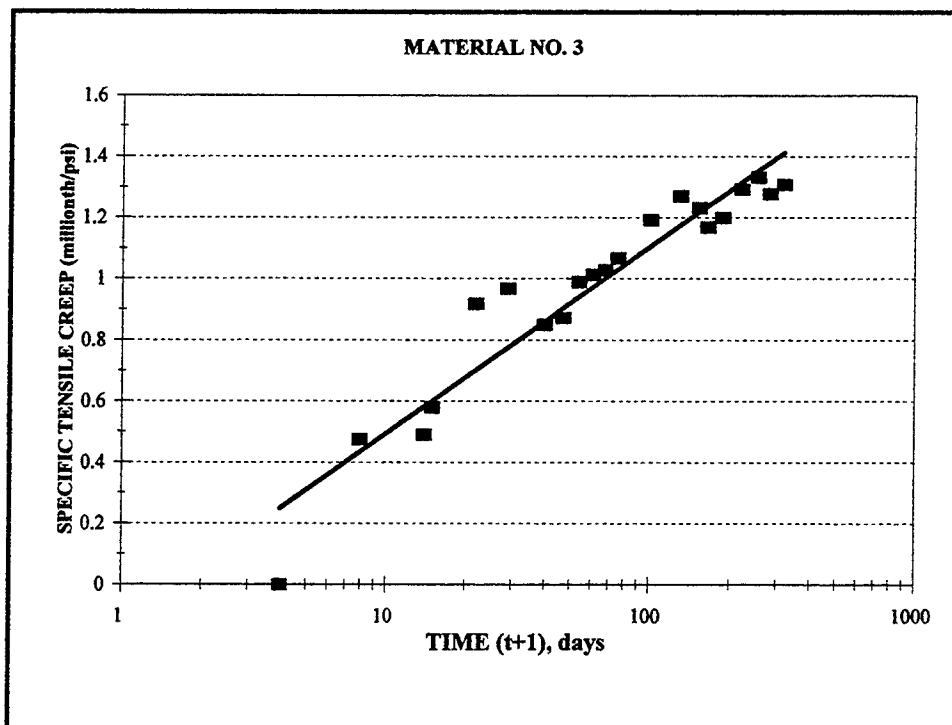


Figure 66. Specific tensile creep for Material No. 3 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

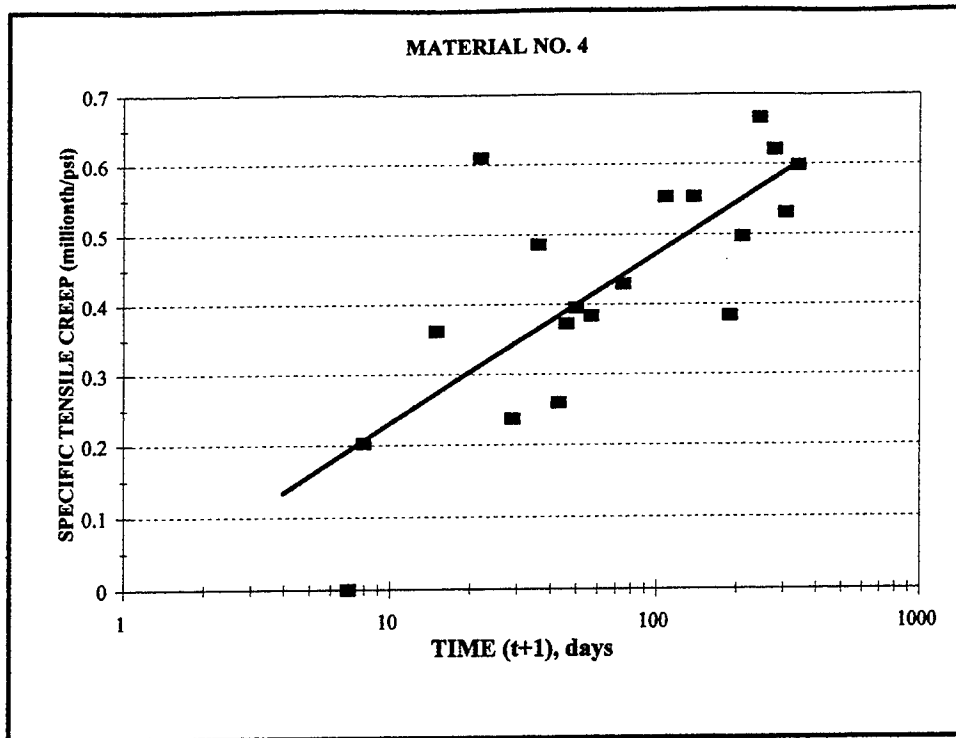


Figure 67. Specific tensile creep for Material No. 4 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

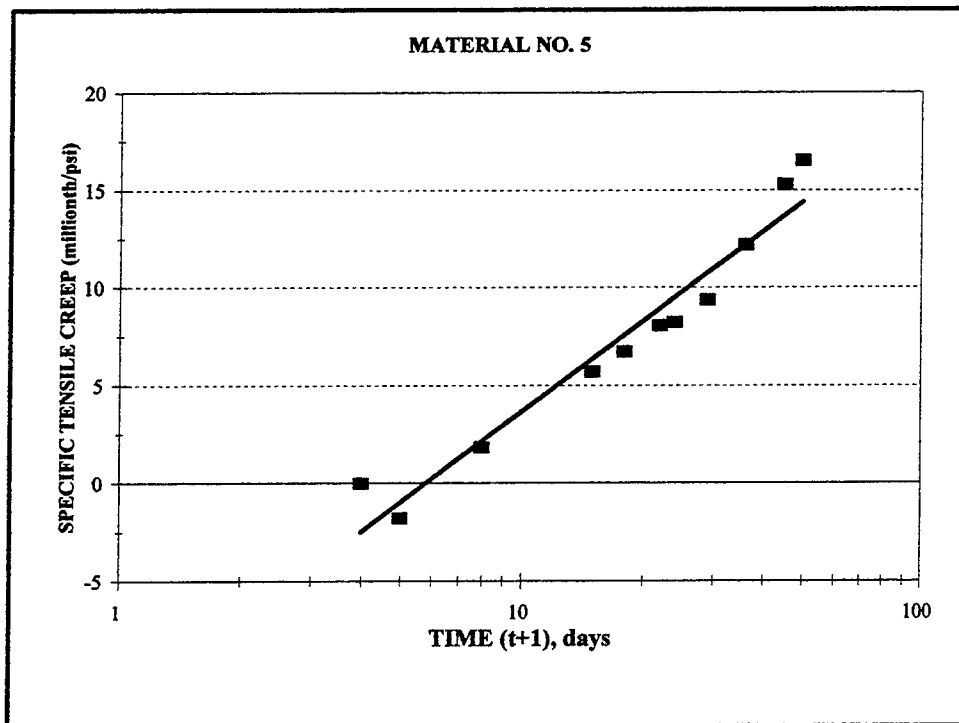


Figure 68. Specific tensile creep for Material No. 5 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

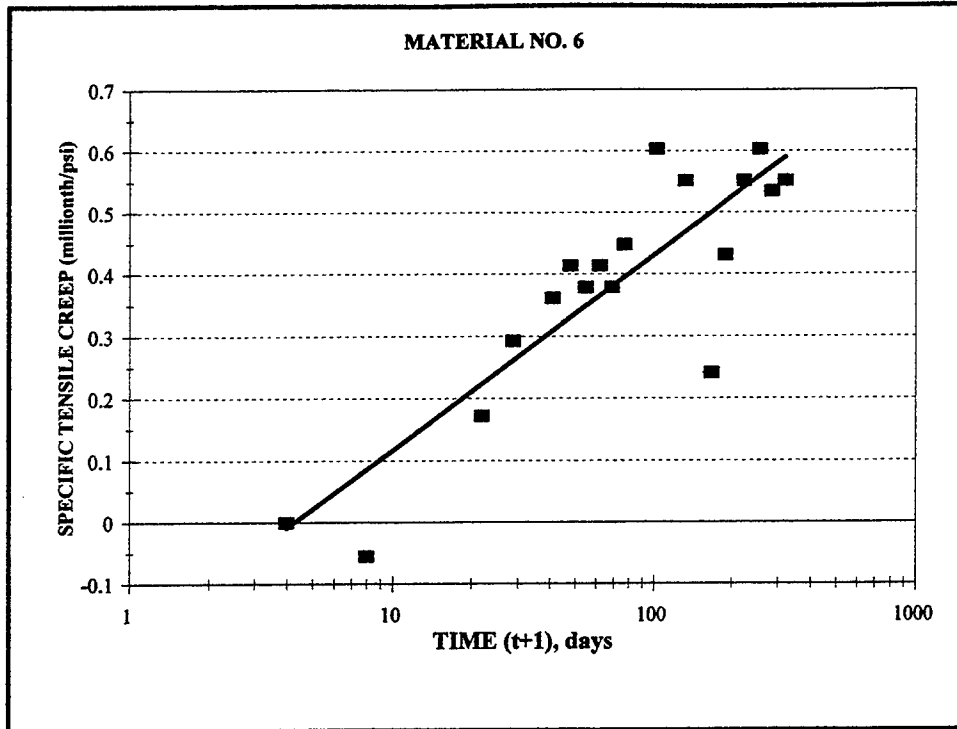


Figure 69. Specific tensile creep for Material No. 6 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

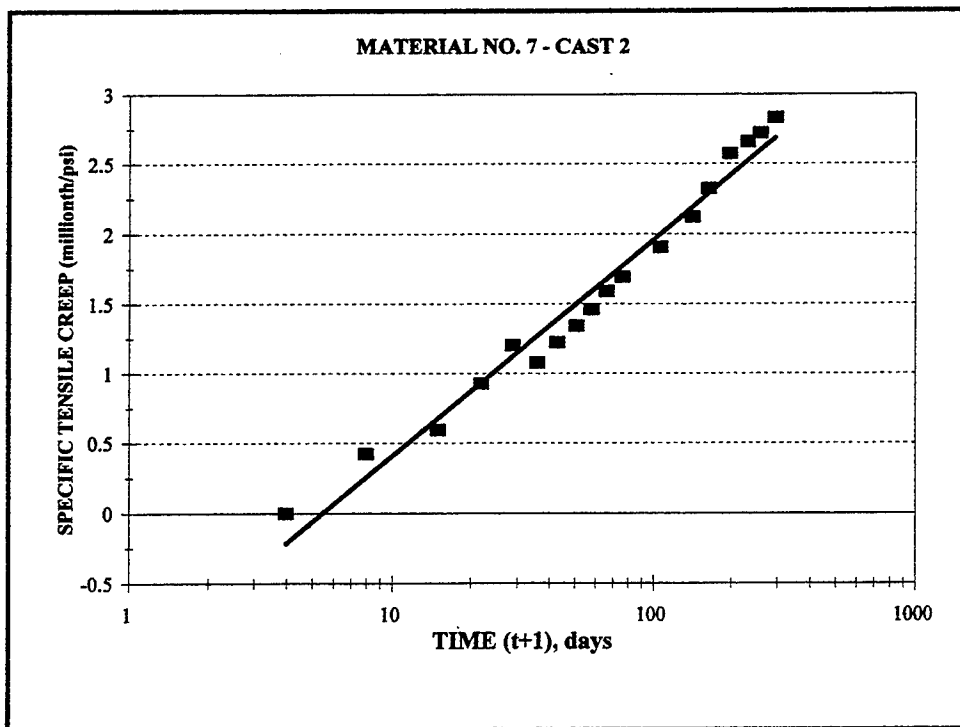


Figure 70. Specific tensile creep for Material No. 7 - (multiply millionths/psi by 145.0377 to obtain millionths MPa)

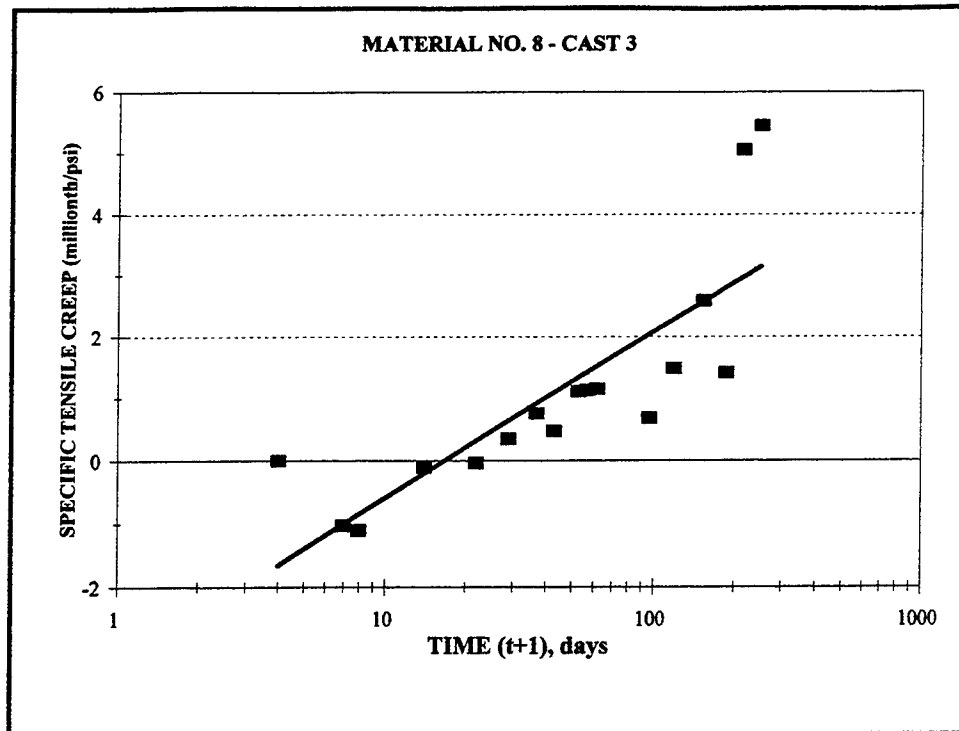


Figure 71. Specific tensile creep for Material No. 8 - (multiply millionths/psi by 145.0377 to obtain millionths MPa)

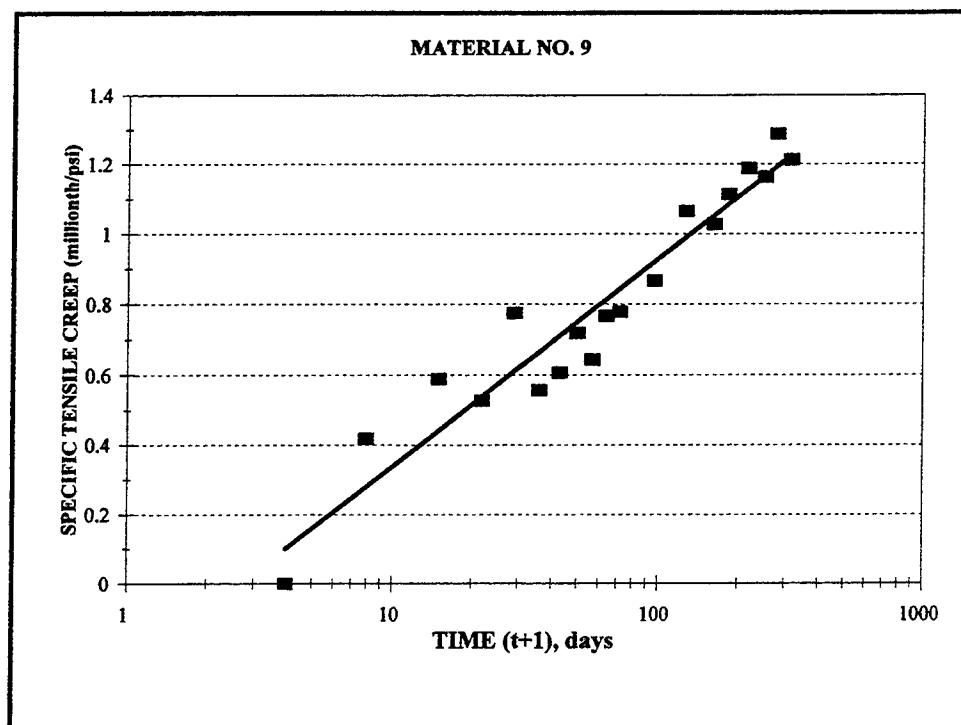


Figure 72. Specific tensile creep for Material No. 9 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

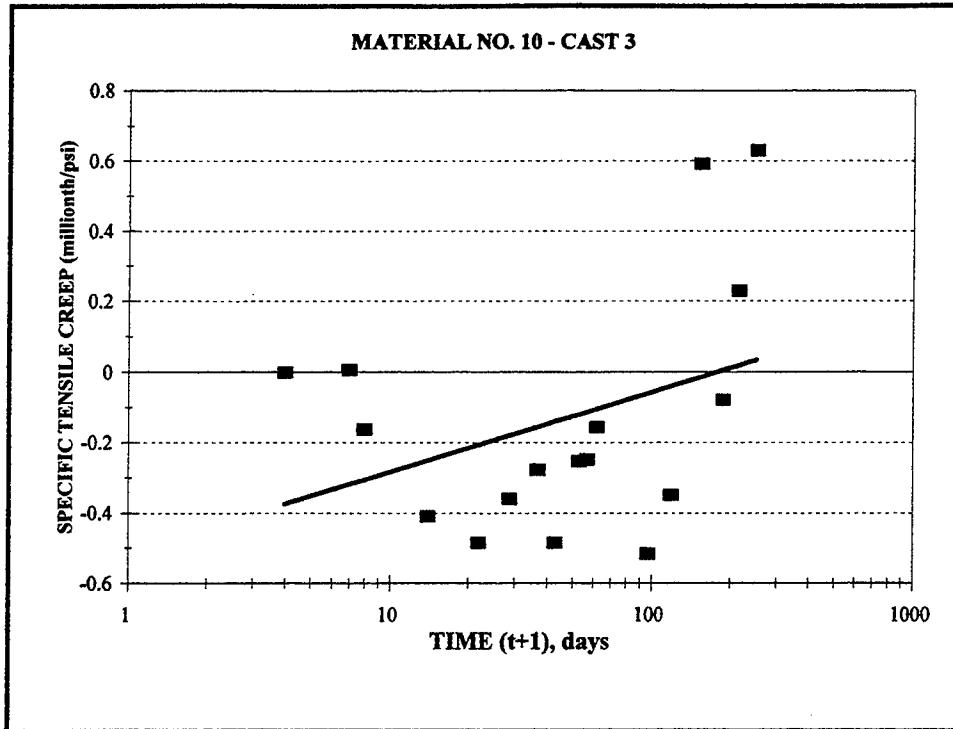


Figure 73. Specific tensile creep for Material No. 10 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

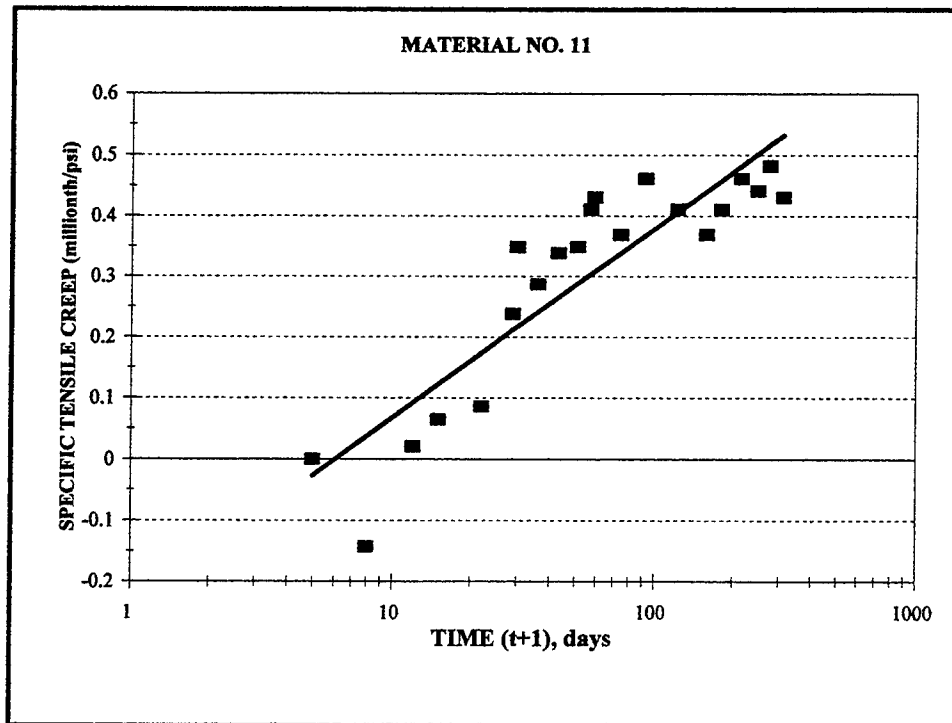


Figure 74. Specific tensile creep for Material No. 11 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

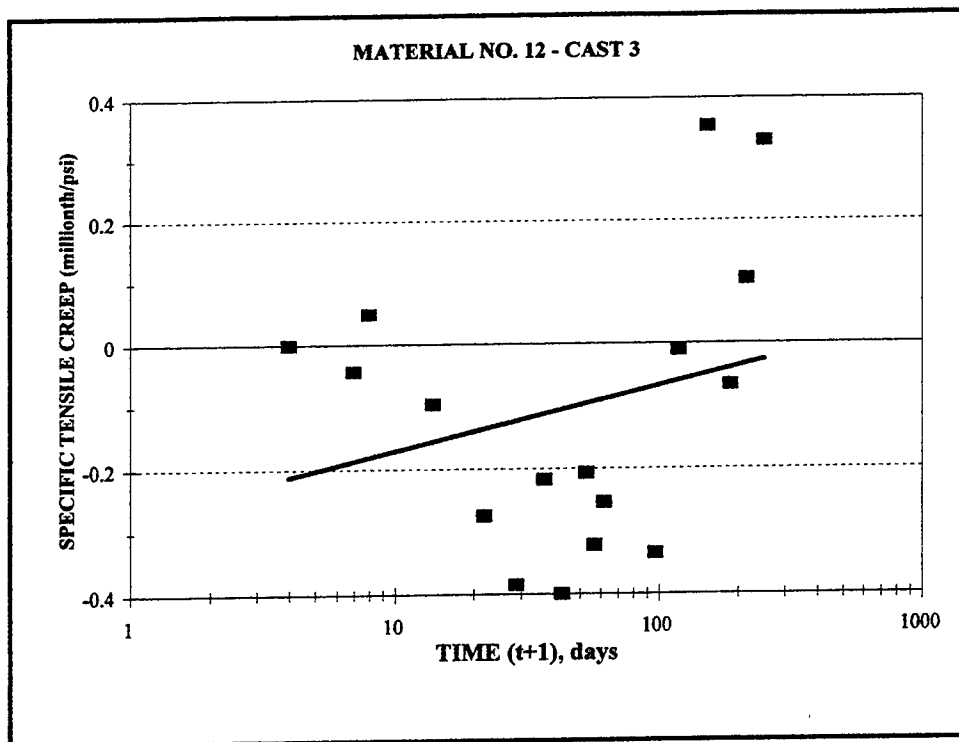


Figure 75. Specific tensile creep for Material No. 12 (multiply millionths/psi by 145.0377 to obtain millionths MPa)

Table 12 Tensile Creep Test Results Summary	
Material No.	Specific Creep at 1 Year Millionths/MPa (Millionths/psi)
1	62.1 (0.42)
2	120.5 (0.831)
3	210.2 (1.449)
4	88.3 (0.609)
5	4,022 (27.732)
6	88.2 (0.608)
7	411.2 (2.835)
8	520.3 (3.587) ¹
9	183.2 (1.263)
10	10.4 (0.072) ¹
11	80.5 (0.555)
12	=0 (=0) ¹
¹ Computed for sustained stress of 20 percent of tensile strength.	

4 Discussion of Test Results

General

In Chapter 3, the results from each of the laboratory tests that were conducted for the 12 concrete repair materials are summarized. In this chapter, these results are discussed in the context of developing performance-based criteria for concrete repair materials. Results of the overall laboratory research program are summarized in Table 13.

Compressive Strength

The 12 materials tested displayed a wide range of compressive strength. There are certainly many repair applications where a high, early strength gain is warranted and in others, such as protective concrete, where it is not. The minimum strength required, if necessary, depends on many factors.

For structural applications, it is recommended that the minimum specified 3-day compressive strength be 17.2 MPa (2,500 psi). At 28 days, it is recommended that the minimum compressive strength be specified as 27.6 MPa (4,000 psi). Naturally, other factors such as that determined from structural analysis may dictate higher specified values to meet certain load-carrying requirements.

Tensile and Flexural Strength

The values obtained from the tensile and flexural strength tests were low. It is believed that the regime of curing following the manufacturer's recommendations resulted in increased drying shrinkage effects that are not as prominent when a regime of 28-day moist curing is followed. In other words, the gain in tensile strength lags behind the development of shrinkage stresses.

Accordingly, for purposes of performance-based criteria, it is recommended that the 28-day tensile or flexural strength be a minimum of 8 percent of the 28-day compressive strength following the manufacturer's recommended curing regime. If 28-day moist curing is used, the minimum value should be 10 percent.

Table 13
Material Performance Summary

No.	Compressive Strength psi	Flexural Strength psi	28-day Tensile Strength psi	7-day Tensile Strength psi	Coeff. of Thermal Expansion × 10 ⁻⁶ /°F	Modulus of Elasticity psi × 10 ⁶ ¹	Drying Shrinkage, Millionths		Ring Test		SPS Plate Max. Tip deflec. in. ²	Specific Creep @ 1 year, Millionths/psi	
							28-day	Peak	Age at 1 st crack, days	Implied Strain Millionths		Compressive	Tensile
1	6,610	289	451	366	5.8	2.8	178	366	6	667	0.0573	0.451	0.42
2	7,180	445	399	318	7.8	3.2	391	1,032	22	364	0.3282	0.603	0.831
3	6,360	421	513	319	7.1	3.7	479	1,116	17	685	0.3678	1.913	1.449
4	11,530	779	348	355	8.3	3.8	201	703	140	560	0.0792	0.260	0.609
5	9,830	758	93	115	7.8	4.5	258	690	10	840	0.0025	0.562	27,732
6	9,760	493	323	232	9.3	5.3	301	878	7	1,808	0.0610	0.872	0.608
7	4,330	365	467	302	8.5	2.7	1,779	2,682	4	3,414	1.4858	3.485	2.835
8	4,060	139	215	212	9.2	2.7	305	1,109	8	1,222	0.4283	1.894	3.587
9	4,780	415	323	202	6.9	2.5	429	877	23	955	0.3190	1.301	1.163
10	5,230	495	402	409	9.9	4.2	16	678	None	0	0.2063	2.037	0.072
11	9,620	503	390	369	7.6	5.9	339	641	15	810	0.2405	0.483	0.555
12	6,940	805	742	583	9.3	3.0	293	634	None	0	0.1560	1.157	0

¹ Divide psi by 145 to obtain MPa.

² Multiply inches by 25.4 to obtain millimetres.

Modulus of Elasticity and Poisson's Ratio

The results of tests to determine the static modulus of elasticity and Poisson's ratio for the concrete repair materials indicate that the values obtained are generally consistent with that for conventional portland-cement concrete. Although there is a relatively wide range of values observed for the modulus of elasticity, a review of the results from the restrained shrinkage tests does not indicate a strong correlation with modulus of elasticity. At this time, based on the results of the laboratory evaluation program, a definitive recommendation regarding limits for modulus of elasticity cannot be made.

Coefficient of Thermal Expansion

The coefficients obtained from the thermal expansion tests were consistent with those observed for conventional concrete. Thus, it is believed that no special performance-based criteria are required for this property assuming the repair material is similar to those evaluated in this study.

Unrestrained Shrinkage versus Restrained Shrinkage Test

The results from the drying shrinkage testing indicate a wide variability in 28-day and long-term shrinkage. For purposes of performance-based criteria, it is proposed that the maximum drying shrinkage should be 400 millionths at 28-days, tested in the laboratory at 50 percent humidity and a temperature of 23 °C (73 °F). The results from the drying shrinkage tests clearly indicate that the 28-day drying shrinkage is on average about 40 percent of the ultimate (long-term) drying shrinkage. For performance-based criteria, this long-term effect must be considered. As a preliminary recommendation, the ultimate value should be limited to no more than 2.0 times the 28-day value.

There is some correlation between the results from the ring test and those from the SPS plate test. Table 14 presents a comparison of the results from the ring and SPS plate tests. The comparison suggests that a material which produces a tip deflection from the SPS plate tests less than 0.25 mm (0.01 in.) at 28 days will be relatively resistant to restrained shrinkage cracking. Moreover, it is reasoned that if no cracking occurs in the ring test in 28 days, then the material should be very resistant to restrained shrinkage cracking. The ring test is a very severe test in terms of highlighting cracking potential under restrained conditions. It is recommended that a standard size ring test be established.

Table 14 Comparison of Ring Test and SPS Plate Test Results		
Material No.	Time to Cracking from Ring Test	SPS Plate Deflection at 28 Days
	Days	mm (in.)
1	6	1.32 (0.052)
2	22	3.07 (0.121)
3	17	6.10 (0.240)
4	140	0.13 (0.005)
5	10	0.00 (0.00)
6	7	0.99 (0.039)
7	4	19.35 (0.762)
8	8	1.27 (0.050)
9	23	2.01 (0.079)
10	> 550	0.28 (0.011)
11	15	3.63 (0.143)
12	> 550	1.63 (0.064)

Compressive and Tensile Creep

Table 15 presents the ratio of specific tensile to compressive creep at 1 year. The value used for specific creep in compression was the average determined for 20 and 40 percent of nominal stress levels. If Materials No. 5, 10, and 12 are not considered, the average value of this tensile to compressive specific creep ratio is 1.17. Although there are variances, this suggests some modest correlation, at least to the same order of magnitude, between tensile and compressive creep. Without conducting tensile creep tests, the specific creep in tension could be roughly computed as 1.2 times that determined for compression.

The results from the present study did not provide definitive information on the effects of tensile creep on restrained shrinkage cracking. A general trend appears to suggest that the tensile creep is not enough to offset cracking from a material prone to high shrinkage. Additional testing is needed to provide a better understanding of tensile creep on restrained cracking behavior. To this end, it is proposed that the tensile creep testing frame shown in Figure 76 be considered in lieu of that used in the present study. This proposed test frame mimics what is currently done for compressive creep. It is more compact and conducive to laboratory testing.

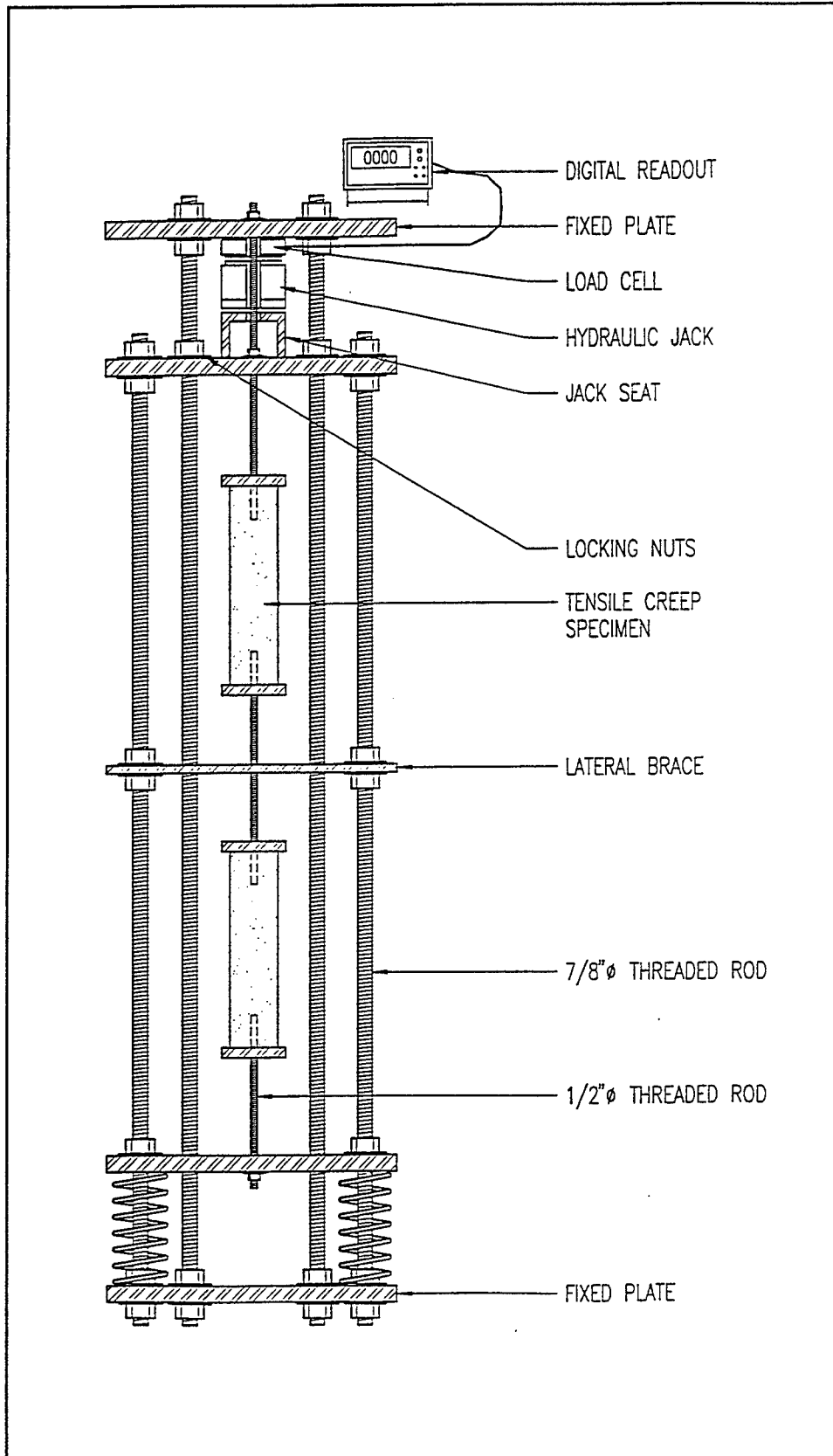


Figure 76. Tensile creep frame (multiply inches by 25.4 to obtain millimetres)

Table 15 Ratio of Tensile to Compressive Specific Creep¹	
Material No.	Ratio
1	1.06
2	1.26
3	0.81
4	1.13
5	47.81
6	0.90
7	0.92
8	1.77
9	1.07
10	0.04
11	1.64
12	≈0
¹ Specific creep values at 1 year.	

5 Summary and Conclusions

Summary

This report describes the laboratory component of an overall research study conducted to evaluate the performance of 12 commercially available concrete repair materials. The evaluation included selected standard and nonstandard test methods developed specifically for the laboratory phase of the program. This evaluation was conducted to provide a basic understanding of those material properties, especially those related to restrained shrinkage in tension zone repair applications. The principal objective of the overall research program is the identification of performance criteria that will lead to cost-effective and durable concrete repairs. Table 13 in Chapter 4 presented a summary of the more salient material performance results from the laboratory evaluation.

Conclusions

The principal conclusion from the laboratory component of the Phase II research study is that the materials exhibited a wide range of behavior, especially from the tests examining unrestrained and restrained shrinkage. Although almost all of the materials exhibited some measure of tensile creep, this property alone does not appear sufficient to offset restrained cracking in high shrinkage-prone materials. Additional testing is needed to better understand the interrelationship between tensile creep and the potential for restrained shrinkage cracking. It is concluded that to mitigate restrained cracking, the material must exhibit a relatively low drying shrinkage, both at 28 days and long-term.

Some tentative performance requirements have been proposed based on the results of the laboratory evaluation. These may require modification pending review of the results of the Phase II field evaluation. The following preliminary performance-based requirements are proposed:

- The minimum 3-day and 28-day compressive strength should be 17.2 MPa (2,500 psi) and 27.6 MPa (4,000 psi), respectively.

- The minimum tensile strength should be 10 percent of the compressive strength for moist curing, but not less than 8 percent of the compressive strength following the manufacturer's recommended curing regime.
- The maximum drying shrinkage at 28 days should be 400 millionths for specimens exposed to 50 percent relative humidity and a temperature of 23 °C (73 °F). The maximum long-term shrinkage should be less than 2.0 times the 28-day shrinkage.
- The tip curling from the SPS plate test should be less than 0.25 mm (0.1 in.) at 28 days. The corollary is that if no cracking appears in a ring test specimen at 28 days, then the material should be highly resistant to restrained shrinkage cracking.

References

- Alberta Transportation and Utilities. (1987). "Alberta concrete patch evaluation program," Report No. #ABTR/RD/RR - 87/05, Edmonton, Alberta, Canada.
- Al-Kubaisy A., and Young, A. G. (1975). "Failure of concrete under sustained tension," *Magazine of Concrete Research* 27(92), 171-178.
- American Concrete Institute Committee 308. (1992). "Standard practice for curing concrete," ACI 308, Detroit, MI.
- American Society for Testing and Materials. (1994). *Annual Book of ASTM Standards*, Philadelphia, PA.
- a. ASTM C 39-93a. "Standard test method for compressive strength of cylindrical concrete specimens."
 - b. ASTM C 78-94. "Standard test method for flexural strength of concrete (using simple beam with third-point loading)."
 - c. ASTM C 109. "Standard test method for compressive strength of hydraulic cement mortars (using 2-in. or 50-mm cube specimens)."
 - d. ASTM C 157-93. "Standard test method for length change of hardened hydraulic-cement mortar and concrete."
 - e. ASTM C 190. "Standard test method for tensile strength of hydraulic cement mortars."
 - f. ASTM C 191. "Standard test method for time of setting of hydraulic cement by Vicat needle."
 - g. ASTM C 266. "Standard test method for time of setting of hydraulic-cement paste by Gillmore needles."
 - h. ASTM C 348. "Standard test method for flexural of hydraulic cement mortars."

- i. ASTM C 469-94. "Standard test method for static modulus of elasticity and Poisson's Ratio of concrete in compression."
 - j. ASTM C 496-94. "Standard test method for splitting tensile strength of cylindrical concrete specimens."
 - k. ASTM C 512-94. "Standard test method for creep of concrete in compression."
 - l. ASTM C 531-85. "Standard test method for linear shrinkage and coefficient of thermal expansion of chemical-resistant mortars, grouts and monolithic surfacings."
 - m. ASTM C 596. "Standard test method for drying shrinkage of mortar containing portland cement."
- Bissonnette, B., and Pigeon, M. (1995). "Tensile creep at early ages of ordinary, silica fume and fiber reinforced concretes," *Cement and Concrete Research*, Vol. No. 4.
- Cook, D. J. (1972). "Some aspects of the mechanism of tensile creep in concrete," *ACI Journal*, 644-649.
- Cook, D. J., and Chindaprasirt, P. (1981). "Influence of loading history upon the tensile properties of concrete," *Magazine of Concrete Research* 33(116), 154-160.
- Emmons, P. H. (1993). *Concrete Repair and Maintenance Illustrated*. R. S. Means Company, Inc.
- Emmons, P. H., and Vaysburd, A. M., and McDonald, J. E. (1993). "A rational approach to durable concrete repairs," *Concrete International* 15(9), 40-45, September 1987.
- Emmons, P. H., Vaysburd, A. M. (1995). "Performance criteria for concrete repair materials, Phase I," Technical Report REMR CS-47, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
- Kovler, K. (1995). "Interdependence of creep and shrinkage for concrete under tension," *Journal of Materials in Civil Engineering*, 96-101.
- Shah, S. P., Karagular, M. E., and Sarigaphuti, M. (1992). "Effects of shrinkage - reducing admixtures on restrained cracking of concrete," *ACI Materials Journal* 89(3), 289-295.

Appendix A

Technical Data, Proportioning, Mixing, and Curing Procedures for Materials Evaluated

Table A1 Manufacturer Data Material No. 1		
Composition	Recommended Use	
Cement Mortar	Fast-setting and high-early-strength mortar for highway and bridge deck patches, pavement joint repair, and highway structural repair	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Initial set, min.: 75°F - 16 95°F - 15 Compressive strength at 48 hr: 75°F - 50 MPa (7,400 psi) 95°F - 45 MPa (6,700 psi) Flexural strength (ASTM C 78 (1994b)): 28 days - 5 MPa (700 psi) Drying shrinkage: ASTM C 157 (1994d) Modified by Alberta Transportation and Utilities: 28 days - 0.022% 120 days - 0.032%	<u>Mixing:</u> Mortar-type mixer. Applications over 2 in. deep should be extended by adding up to 50 lb of 3/8-in. pea gravel per 50-lb bag. Water - 5-1/2 pt per 50-lb bag Mixing time: 3 min, minimum. <u>Application:</u> 15 min, maximum, for mixing, placing, and finishing. Work and tamp down the material firmly into the bottom and sides of the patch. Screed and trowel to the level of existing concrete. <u>Curing:</u> In accordance with ACI 308 (1992). <u>Hot weather recommendations:</u> 1. Cool material and aggregate. 2. Cool mixing water. 3. Increase mix water addition by a maximum of 1-1/2 pt per bag.	Finished easily. No bleeding observed.
NOTE: To obtain Celsius (c) temperature readings from Fahrenheit (F) readings, use the following formula: $C = (5/9) (F-32)$. To obtain Kelvin (K) readings, use $K = (5/9) (F-32) + 273.15$.		

Table A2 Manufacturer Data Material No. 2		
Composition	Recommended Use	
Blend of portland cements, well graded aggregates, and special additives. Ready to use material	High-early-strength concrete for repair of parking decks, concrete slabs, industrial flooring, masonry blockfill, highways, spalled concrete surfaces	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Set time: Initial - 6 hr Final - 8 hr Compressive strength: 1 day - 20 MPa (3,000 psi) 7 days - 35 MPa (5,000 psi) 28 days - 48 MPa (7,000 psi) Drying shrinkage at 28 days: (ASTM C 157 Modified (1994d)) Data sheet - 0.04% Manufacturer's data - 0.048% Flexural strength (ASTM C 78 (1994b)): 28 days - 5 MPa (700 psi) Pot Life - 30 min	<u>Mixing:</u> Mechanical mixer. Up to 4 qt of water per 80-lb bag. Mixing time: - 6 min, maximum. <u>Application:</u> Place material quickly and continuously in full depth, working from one side of the repair area to the other, maintaining a minimum thickness of 1-in. Standard consolidation and finishing techniques. <u>Curing:</u> Standard concrete curing practices are recommended.	Dry mix, but consolidated nicely. Finished easily.

**Table A3
Manufacturer Data
Material No. 3**

Composition	Recommended Use	
A single component polymer-modified portland cement-based material. Contains acrylic polymer	High-strength material for horizontal surfaces. Can be placed from feather edge to 2 in. in one pass	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Compressive strength: 1 day - 10 MPa (1,500 psi) 7 days - 35 MPa (5,000 psi) 14 days - 37 MPa (5,400 psi) 28 days - 40 MPa (5,800 psi) Tensile strength (ASTM C 190 (ASTM 1994e)) 7 days - 4 MPa (570 psi) 14 days - 4.1 MPa (600 psi) 28 days - 4.5 MPa (650 psi) Drying shrinkage (ASTM C 157 Modified (1994d)): Manufacturer's data 0.05%	<u>Mixing:</u> Mix 60-lb bag into 4-1/2 qt water with low-speed mixer. Up to 1 qt water can be added to adjust workability. Allow mix to "breathe" for 2-3 min, then remix for 1 min. For applications over 2 in. thick, 30 lb of 3/8-in. pea gravel should be added per 60-lb bag. <u>Application:</u> Rough trowel area and allow to set to thumbprint. Finish smooth using a sweet coat after patch firms. Finish by troweling smooth. Do not overwork. <u>Curing:</u> Wet cure for 3 days (based on manufacturer's recommendation; no-mist curing required is stated in material data sheet). Material was preblended with pea stone and supplied in 80-lb bags. Manufacturer recommended 3-1/2 qt water per 80-lb bag.	Mixture had virtually no slump. Did not flow under compaction. Finished nicely. Hard to consolidate. Added 0.12 L of extra water for three-bag batch.

Table A4 Manufacturer Data Material No. 4		
Composition	Recommended Use	
Cement-based concrete	High early strength material for horizontal and vertical use	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Set time (ASTM C 191 (ASTM 1994f)): Initial - 25 min Final - 35 min Compressive strength: 3 hr - 28 MPa (4,000 psi) 1 day - 35 MPa (5,000 psi) 7 days - 52 MPa (7,500 psi) 28 days - 55 MPa (8,000 psi) Flexural strength (ASTM C 78 (1994b)): 7 days - 8 MPa (1,200 psi) Shrinkage (ASTM C 157 Modified (1994d)): Data sheet - 28 days - 0.00% Manufacturer's data - 28 days - 0.05%	<u>Mixing</u>: Mortar mixer is recommended. Applications over 2 in. deep should be extended with 25 lb pea gravel. Water - from 2-1/2 to 3 qt per 50-lb bag Mixing time: from 2 to 5 min. <u>Application</u>: Provides about 20 min. working time. Pour from one side of the cavity to the other side. Do not place in layers. Material can be troweled or poured into the area to be repaired. After leveling, the repair can be broomed, brushed, or troweled. <u>Curing</u>: When surface hardens, soak the surface with sufficient water and keep wet for at least 30 min.	Added 0.24 L of extra water for three-bag batch. Very workable but sticky. Had a high slump. Finished easily.

Table A5
Manufacturer Data
Material No. 5

Composition	Recommended Use	
No information in manufacturer's data sheet	High-strength, rapid setting material for repair of bridge decks, concrete pavements, airport runways and taxiways, industrial floors, loading docks, general concrete, precast and prestressed concrete	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Set time (ASTM C 266 (1994g)): Initial - 15-20 min Final - 20-25 min Compressive strength (ASTM C 109 Modified (1994c)): 1 hr - 17-21 MPa (2,500-3,000 psi) 3 hr - 48-55 MPa (7,000-8,000 psi) 3 days - 62-29 MPa (9,000-10,000 psi) Drying shrinkage (ASTM C 157 (1994d)): 28 days - 0.041% Ultimate - 0.056% (Personal communication with Tony B. Husbands, WES, May 1994).	<u>Mixing:</u> Mortar mixer. It was recommended initially not to use aggregate extension for the 3-in.-thick experimental repairs. Total mixing water per 50-lb bag not to exceed 1-1/2 gal. All required water shall be put in the mixer, and then material is to be added. Mixing time: 2-3 min. <u>Application:</u> Material should be placed in about 10 min. Place from one side to the other, working material into sides and bottom of patch area. Screed and level to proper elevation. Trowel with metal tools only. <u>Curing:</u> As soon as possible without marring, begin curing with water. Saturated burlap may also be used. Maintain a wet surface for a minimum of 1 hr, then apply curing compound.	Mixture very fluid, but sticky. Relatively quick set. Very rapid loss of workability.

Table A6
Manufacturer Data
Material No. 6

Composition	Recommended Use	
Polymer and microsilica modified cement-based repair material	High-strength repair material for parking decks, bridge structures, pier and dock supports, concrete in marine environment, sewage treatment plants, dams, and retaining walls. Material for horizontal and formed vertical and overhead surfaces	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Set time: 4-6 hr Compressive strength at 48 hr: 1 day - 17 MPa (2,500 psi) 3 days - 32 MPa (4,700 psi) 7 days - 41 MPa (6,000 psi) 28 days - 63 MPa (9,200 psi) Flexural strength (ASTM C 348 (1994h)): 1 day - 4 MPa (600 psi) 7 days - 9 MPa (1,270 psi) 28 days - 11 MPa (1,500 psi) Tensile strength (ASTM C 496 (1994j)): 7 days - 3.7 MPa (535 psi) 28 days - 5.7 MPa (820 psi) Drying shrinkage (ASTM C 157 Modified (1994d)): 28 days - 0.086% Modulus of elasticity: 28 days - 6.14×10^6 psi	<u>Mixing</u>: Mortar mixer. No aggregate extension is recommended. Mixing water per 50-lb bag - 0.53 to 0.58 gal. Add water in mixer and slowly add material while mixing. Mixing time: - 5 min, minimum. <u>Application</u>: No specific recommendations in the data sheet. Should be handled as regular concrete (personal communication with Duane Emmett, April 1994). Working time: about 45 min at (73 °F); 20 min at 90 °F.	Easy to consolidate. Difficult to finish. Slow setting time.

**Table A7
Manufacturer Data
Material No. 7**

Composition	Recommended Use	
A single component, polymer-modified repair material	Repair of horizontal, vertical, and overhead concrete surfaces	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Set time: Initial - 20-30 min. Compressive strength at 48 hr: 1 day - 20 MPa (2,960 psi) 7 days - 47 MPa (6,825 psi) 14 days - 48 MPa (6,915 psi) 28 days - 49 MPa (7,050 psi) Flexural strength (ASTM C 348 (1994h)): 7 days - 5.8 MPa (845 psi) 28 days - 6.4 MPa (930 psi) Tensile strength (ASTM C 190 (1994e)): 1 day - 1.9 MPa (270 psi) 7 days - 3.3 MPa (475 psi) 14 days - 4.1 MPa (600 psi) 28 days - 4.1 MPa (600 psi) Drying shrinkage: (ASTM C 157 Modified (1994d)): Ultimate - 0.07% Modulus of elasticity: 28 days - $(6.14 \times 10^6 \text{ psi})$	<u>Mixing</u>: Material is to be extended with 25 lb of pea stone per 50-lb bag. Mixing water: 4-5 qt per bag (data sheet). Manufacturer's recommendation - 5-3/4 qt per bag. Mix to a no lump, putty-like consistency. <u>Application</u>: Trowel the mix into patch cavity with firm pressure. Overbuild patch by at least 1/4". Depending on the temperature and humidity, the material will take an initial set in about 30 min. After the initial set, the material can be shaved for 1 to 2 hr to achieve the desired shape. The material may be floated, wet-brushed, or troweled smooth to finish. <u>Curing</u>: Curing is not needed except in very hot, dry weather.	Very fluid at first, but set quickly. Some bleed water noticed.

Table A8**Manufacturer Data****Material No. 8**

Composition	Recommended Use	
A single component, lightweight, fiber and polymer-modified repair material	For vertical and overhead high building applications	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Compressive strength: 7 days - 28-38 MPa (4,000-4,800 psi) 28 days - 34.5-40 MPa (5,000-5,800 psi) Flexural strength (ASTM C 348 (1994h)): 7 days - 5 MPa (725 psi) Tensile strength (ASTM C 190 (1994e)): 7 days - 2 MPa (290 psi) Drying shrinkage (ASTM C 157 Modified (1994d)): 28 days - 0.04-0.06% Drying shrinkage (Coutinho Ring): 7 days - no cracks 28 days - no cracks	<u>Mixing:</u> A force action mixer is recommended. Mixing water: 6.5 pt per 45-lb bag. Dependent on the ambient temperature and the desired consistency, additional water may be added up to 7 pt per 45-lb bag. Mixing time: 3-5 min. Pot Life: about 30 min. <u>Application:</u> Material is applied by hand or trowel. The repair is finished by striking off with a straight edge and closing with a steel float. <u>Curing:</u> Should be cured immediately after finishing in accordance with good concrete practice (ACI 308 (ACI 1992)).	Added 0.12 to 0.24 L extra water per four-bag batch. Very workable. Difficult to finish. Hard to consolidate.

**Table A9
Manufacturer Data
Material No. 9 (Control)**

Composition	Recommended Use	
Portland-cement concrete	For bridge overlays	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Compressive strength: 28 days -28 MPa (4,000 psi) This "control" concrete mix was produced and packaged by American Stone Mix, Inc. on investigator's request, and, therefore, manufacturer's technical data do not exist. Drying shrinkage data, 0.06% at 28 days, were selected based on standard data for concrete of average quality.	<u>Mixing</u>: Mechanical mixer. Mix 80-lb bag with up to 4 qt of water. Mixing time: 6 min, maximum. Concrete is ready to use and does not require addition of aggregate. <u>Application</u>: Concrete should be placed in prepared area in full depth, working from one side of the repair area to the other. Concrete shall be properly compacted without voids. Finishing and curing of this material is no different from good practices of conventional concrete technology. <u>Curing</u>: Should be cured immediately after finishing in accordance with good concrete practice (ACI 308 (ACI 1992)).	Some bleed water noticed. Finished easily.

Table A10
Manufacturer Data
Material No. 10

Composition	Recommended Use	
One-component polymer modified cement-based mortar	Fast-setting repair material for horizontal and formed vertical applications in interior and exterior environments	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Set time: Initial - 1.5 hr Final - 2 hr Compressive strength: 1 day - 17 MPa (2,500 psi) 7 days - 38 MPa (5,500 psi) 28 days - 52 MPa (7,500 psi) Flexural strength (ASTM C 348 (1994h)): 28 days - 10 MPa (1,500 psi) Tensile strength (ASTM C 496 (1994j)): 1 day - 2.6 MPa (375 psi) 7 days - 3.1 MPa (450 psi) 28 days - 4 MPa (600 psi) Drying shrinkage (ASTM C 596 (1994m)): 28 days - 0.093% Modulus of Elasticity (ASTM C 469 (1994i)): 28 days - 15,200 MPa (2.2×10^6 psi)	<u>Mixing</u>: Mortar mixer is recommended. Mix 55-lb bag with 0.79 gal water. Mixing time: 3-5 min. For applications of more than 1 in. thickness, an extension of 25 lb pea gravel, $\frac{3}{8}$ in. per 55-lb bag is required. Working time: 30 min. The material may be finished as any other conventional concrete mix. <u>Curing</u>: Minimum curing time for wet curing - 2 days. Curing compound may be used. Manufacturer's recommended curing for this project: 2 days moist cure, and then apply curing compound.	Added 0.12 to 0.24 L of extra water per three-bag batch. Mixed fine, but sticky. Fairly fluid. Easy to consolidate and finish.

Table A11
Manufacturer Data
Material No. 11

Composition	Recommended Use	
Cement Mortar	Fast-setting and high early strength mortar for highway and bridge deck patches, pavement joint repair, and highway structural repair	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Working time: 30-40 min. Compressive strength: 1 day - 17 MPa (2,500 psi) 7 days - 41 MPa (600 psi) 28 days - 55 MPa (8,000 psi) Flexural strength (ASTM C 78 (1994b)): 28 days - 5.3 MPa (770 psi) Drying shrinkage (ASTM C 157 (1994d)): 28 days - 0.06% (data sheet) 28 days - <0.075% Modulus of Elasticity: 28 days - 33,120 MPa (4.8×10^6 psi)	<u>Mixing</u>: Mortar mixer is recommended. Mix 55-lb bag with 0.79 gal water. Water: Approximately 0.5 gal per 55-lb bag to obtain a slump of 4-6 in. Mixing Time: 3-5 min. No aggregate extension is required. No special requirements for finishing. <u>Curing</u>: Moist cure for 2 days, then apply curing compound.	Hard to finish.

Table A12
Manufacturer Data
Material No. 12

Composition	Recommended Use	
Two-component, polymer-modified portland-cement mortar	For overlays, structural repairs for parking facilities, industrial plants, walkways, bridges, tunnels, and dams.	
Manufacturer's Technical Data	Manufacturer's Application Data	Comments
Application time: about 15 min. Finishing time: 20 to 60 min. Compressive strength (ASTM C 39 (1994a)): 1 day - 14 MPa (2,000 psi) 3 days - 28 MPa (4,100 psi) 28 days - 42 MPa (6,100 psi) Flexural strength (ASTM C 78 (1994b)): 28 days - 8.3 MPa (1,200 psi) Tensile strength (ASTM C 496 (1994j)): 1 day - 2.8 MPa (400 psi) 7 days - 3.5 MPa (500 psi) 28 days - 5.5 Pa (800 psi) Drying shrinkage data for this material is not presented by the manufacturer. The shrinkage property of 0.147% as tested by Alberta Transportation and Utilities for a similar product was used.	<u>Mixing</u>: Mortar mixer. Pour all component "A" into mixer, add all of component "B", then introduce aggregate 42 lb per unit; aggregate has to be SSD. <u>Application</u>: Mix must be scrubbed into the substrate. Force material against the edge of the repair, working toward the center. After filling repair, consolidate, then screed. Allow to set to desired stiffness, then finish with wood or sponge float. <u>Curing</u>: Moist curing recommended.	Difficulty encountered in mixing with gravel. Difficulty working and placing in molds. Stony when extended with gravel.

Appendix B

Compressive Strength Data

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: F O S R O C - P A T C H R O C 1 0 - 6 0
 Batch id.: Material No. 1

Specimen Age: 3 day

Avg. Comp. Str. 5,100 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.017	2.998	3.007	7.103	0	0	34,500	4,860	Shear
2	3.011	3.009	3.010	7.117	0	0	36,000	5,060	Shear
3	2.994	3.011	3.003	7.080	0	0	38,000	5,370	Cone
AVERAGE			3.007	7.100	0	0	36,167	5,100	

Specimen Age: 7 day

Avg. Comp. Str. 5,500 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.000	2.997	2.999	7.062	0	0	39,000	5,520	Cone
2	2.976	3.005	2.990	7.024	0	0	40,500	5,770	Columnar
3	3.002	3.016	3.009	7.110	0	0	37,000	5,200	Shear
AVERAGE			2.999	7.065	0	0	38,833	5,500	

Specimen Age: 28 day

Avg. Comp. Str. 6,610 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.035	2.995	3.015	7.139	0	0	48,000	6,720	Cone
2	3.004	3.010	3.007	7.102	0	0	45,500	6,410	Cone
3	3.000	2.984	2.992	7.030	0	0	47,000	6,690	Cone/Split
AVERAGE			3.005	7.090	0	0	46,833	6,610	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: AMSTONE - METROMIX 240
 Batch id.: Material No. 2 (Batch A)

Specimen Age: 3 day
 Avg. Comp. Str. 4,070 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.018	3.000	3.009	7.111	0	0	29,500	4,150	Shear
2	2.995	3.015	3.005	7.092	0	0	29,000	4,090	Cone
3	3.002	3.009	3.006	7.095	0	0	28,250	3,980	Cone
AVERAGE			3.006	7.099	0	0	28,917	4,070	

Specimen Age: 7 day
 Avg. Comp. Str. 5,420 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.009	2.985	2.997	7.053	0	0	38,500	5,460	Shear
2	3.008	2.991	3.000	7.067	0	0	38,750	5,480	Cone
3	2.994	2.997	2.996	7.048	0	0	37,500	5,320	Cone
AVERAGE			2.997	7.056	0	0	38,250	5,420	

Specimen Age: 28 day
 Avg. Comp. Str. 6,600 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.015	3.016	3.015	7.141	0	0	47,000	6,580	Cone
2	3.007	3.003	3.005	7.092	0	0	47,000	6,630	Shear/Cone
3	2.981	3.016	2.998	7.061	0	0	46,500	6,590	Cone
AVERAGE			3.006	7.098	0	0	46,833	6,600	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested:

AMSTONE - METROMIX 240

Batch id.: Material No. 2 (Batch B)

Specimen Age: 3 day

Avg. Comp. Str. 5,470 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.014	2.991	3.003	7.080	0	0	39,500	5,580	Cone
2	2.993	3.002	2.998	7.057	0	0	37,000	5,240	Shear
3	2.981	2.987	2.984	6.993	0	0	39,000	5,580	Cone
AVERAGE			2.995	7.044	0	0	38,500	5,470	

Specimen Age: 7 day

Avg. Comp. Str. 6,860 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.985	3.020	3.003	7.080	0	0	48,500	6,850	Cone
2	3.004	2.992	2.998	7.059	0	0	48,000	6,800	Shear
3	3.009	2.990	3.000	7.066	0	0	49,000	6,930	Shear
AVERAGE			3.000	7.069	0	0	48,500	6,860	

Specimen Age: 28 day

Avg. Comp. Str. 7,760 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.982	3.002	2.992	7.030	0	0	55,000	7,820	Cone
2	3.003	2.992	2.998	7.057	0	0	52,500	7,440	Cone
3	2.987	3.025	3.006	7.096	0	0	57,000	8,030	Cone
AVERAGE			2.998	7.061	0	0	54,833	7,760	

COMPRESSIVE STRENGTH TEST (6" Diameter Cylindrical Specimens)

Product being tested: CONPROCO - ONE SHOT
 Batch id.: Material No. 3

Specimen Age: 3 day
 Avg. Comp. Str. 3,040 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.990	3.016	3.003	7.083	0	0	22,500	3,180	Cone
2	3.021	2.976	2.999	7.062	0	0	19,500	2,760	Shear
3	2.994	2.997	2.996	7.048	0	0	22,500	3,190	Cone/Shear
AVERAGE			2.999	7.064	0	0	21,500	3,040	

Specimen Age: 7 day
 Avg. Comp. Str. 4,260 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.008	3.008	3.008	7.107	0	0	29,500	4,150	Cone
2	3.000	3.000	3.000	7.069	0	0	32,000	4,530	Cone
3	2.995	3.001	2.998	7.059	0	0	29,000	4,110	Cone
AVERAGE			3.002	7.078	0	0	30,167	4,260	

Specimen Age: 28 day
 Avg. Comp. Str. 6,360 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.010	3.009	3.010	7.114	0	0	44,500	6,260	Cone
2	2.978	3.024	3.001	7.073	0	0	43,500	6,150	Shear
3	2.997	2.998	2.997	7.057	0	0	47,000	6,660	Cone
AVERAGE			3.003	7.081	0	0	45,000	6,360	

COMPRESSIVE STRENGTH TEST (6" Diameter Cylindrical Specimens)

Product being tested: CONPROCO - ONE SHOT
 Batch id.: Material No. 3

Specimen Age: 3 day
 Avg. Comp. Str. 1,560 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	5.985	6.000	5.993	28.204	0	0	45,500	1,610	Cone
2	5.985	5.980	5.983	28.110	0	0	44,500	1,580	Cone
3	5.989	5.995	5.992	28.199	0	0	42,000	1,490	Cone
AVERAGE			5.989	28.171	0	0	44,000	1,560	

Specimen Age: 7 day
 Avg. Comp. Str. 2,400 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	6.025	5.985	6.005	28.321	0	0	71,500	2,520	Cone
2	6.000	5.988	5.994	28.218	0	0	63,500	2,250	Cone
3	6.000	5.970	5.985	28.133	0	0	68,500	2,430	Cone
AVERAGE			5.995	28.224	0	0	67,833	2,400	

Specimen Age: 28 day
 Avg. Comp. Str. 3,830 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	6.010	5.980	5.995	28.227	0	0	109,000	3,860	Cone
2	5.965	6.000	5.983	28.110	0	0	108,500	3,860	Cone
3	5.980	6.010	5.995	28.227	0	0	106,000	3,760	Cone/Split
AVERAGE			5.991	28.188	0	0	107,833	3,830	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: FIVE STAR Structural Concrete
 Batch id.: Material No. 4 (Batch A)

Specimen Age: 3 day
 Avg. Comp. Str. 9,710 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.994	2.990	2.992	7.031	0	0	67,000	9,530	Shear
2	2.979	3.015	2.997	7.055	0	0	70,000	9,920	Shear
3	3.023	2.978	3.000	7.070	0	0	68,500	9,690	Shear
AVERAGE			2.996	7.052	0	0	68,500	9,710	

Specimen Age: 7 day
 Avg. Comp. Str. 10,180 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.009	3.004	3.007	7.099	0	0	80,500	11,340	Cone
2	3.023	2.973	2.998	7.058	0	0	78,000	11,050	Cone & Split
3	2.980	3.013	2.997	7.052	0	0	57,500	8,150	Cone
AVERAGE			3.000	7.070	0	0	72,000	10,180	

Specimen Age: 28 day
 Avg. Comp. Str. 12,220 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.997	3.000	2.999	7.062	0	0	86,000	12,180	Cone
2	3.000	3.001	3.001	7.071	0	0	88,000	12,440	Cone/Split
3	2.979	3.016	2.998	7.057	0	0	85,000	12,050	Cone
AVERAGE			2.999	7.063	0	0	86,333	12,220	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: FIVE STAR Structural Concrete
 Batch id.: Material No. 4 (Batch B)

Specimen Age: 3 day

Avg. Comp. Str. 7,570 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.979	2.987	2.983	6.989	0	0	51,750	7,400	Cone
2	2.980	2.989	2.985	6.996	0	0	54,500	7,790	Cone
3	3.015	3.010	3.013	7.128	0	0	53,500	7,510	Cone
AVERAGE			2.993	7.037	0	0	53,250	7,570	

Specimen Age: 7 day

Avg. Comp. Str. 9,380 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.006	3.002	3.004	7.087	0	0	69,500	9,810	Shear
2	3.010	2.999	3.004	7.090	0	0	62,000	8,750	Cone & Split
3	2.991	3.017	3.004	7.088	0	0	68,000	9,590	Cone
AVERAGE			3.004	7.088	0	0	66,500	9,380	

Specimen Age: 28 day

Avg. Comp. Str. 10,840 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.995	3.000	2.998	7.057	0	0	77,500	10,980	Cone
2	3.012	2.995	3.003	7.085	0	0	75,000	10,590	Cone/Split
3	2.979	3.029	3.004	7.087	0	0	77,500	10,940	Cone
AVERAGE			3.002	7.076	0	0	76,667	10,840	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: W.R.GRACE - FASTRAK PATCH
 Batch id.: Material No. 5

Specimen Age: 3 day
 Avg. Comp. Str. 6,450 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.005	3.001	3.003	7.083	0	0	45,000	6,350	Cone / Shear
2	2.998	3.000	2.999	7.066	0	0	46,500	6,580	Cone
3	3.009	2.993	3.001	7.074	0	0	45,500	6,430	Cone
AVERAGE			3.001	7.074	0	0	45,667	6,450	

Specimen Age: 7 day
 Avg. Comp. Str. 6,920 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.984	3.015	3.000	7.066	0	0	47,500	6,720	Cone / Shear
2	3.017	2.996	3.007	7.099	0	0	50,500	7,110	Cone
3	2.995	3.005	3.000	7.070	0	0	49,000	6,930	Cone
AVERAGE			3.002	7.078	0	0	49,000	6,920	

Specimen Age: 28 day
 Avg. Comp. Str. 9,830 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.000	3.007	3.004	7.086	0	0	70,500	9,950	Cone / Shear
2	2.996	3.013	3.004	7.088	0	0	67,500	9,520	Cone
3	2.993	3.013	3.003	7.083	0	0	71,000	10,020	Cone
AVERAGE			3.004	7.086	0	0	69,667	9,830	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: EUCO SR-93
 Batch id.: Material No. 6

Specimen Age: 3 day

Avg. Comp. Str. 4,140 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
2.994	3.010	3.001	3.006	7.095	0	0	28,500	4,020	Cone
2	3.004	2.998	3.001	7.072	0	0	29,000	4,100	Shear
3	2.997	3.005	3.001	7.074	0	0	30,500	4,310	Cone
AVERAGE			3.003	7.081	0	0	29,333	4,140	

Specimen Age: 7 day

Avg. Comp. Str. 5,910 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.007	3.020	3.014	7.132	0	0	43,000	6,030	Cone
2	2.997	3.028	3.013	7.128	0	0	42,500	5,960	Cone
3	2.983	3.018	3.001	7.071	0	0	40,500	5,730	Cone
AVERAGE			3.009	7.110	0	0	42,000	5,910	

Specimen Age: 28 day

Avg. Comp. Str. 9,670 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.990	3.008	2.999	7.064	0	0	66,000	9,340	Cone
2	2.999	3.009	3.004	7.087	0	0	67,500	9,530	Cone
3	3.012	2.997	3.005	7.091	0	0	72,000	10,150	Cone
AVERAGE			3.003	7.081	0	0	68,500	9,670	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: CONPROCO - CONPRO-SET
Batch id.: Material No. 7

Specimen Age: 3 day
 Avg. Comp. Str. 2,830 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.992	3.018	3.005	7.091	0	0	18500	2610	Cone
2	3.016	2.980	2.998	7.058	0	0	20700	2930	Shear
3	3.002	3.006	3.004	7.087	0	0	20850	2940	Cone/Shear
AVERAGE			3.002	7.079	0	0	20017	2830	

Specimen Age: 7 day
 Avg. Comp. Str. 3,730 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.003	3.003	3.003	7.082	0	0	25,000	3,530	Cone
2	3.013	3.014	3.014	7.133	0	0	25,000	3,510	Cone
3	2.565	3.021	2.793	6.127	0	0	25,500	4,160	Cone
AVERAGE			2.937	6.781	0	0	25,167	3,730	

Specimen Age: 28 day
 Avg. Comp. Str. 4,330 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.993	3.005	2.999	7.064	0	0	27,000	3,820	Cone
2	2.993	3.013	3.003	7.082	0	0	31,000	4,380	Shear
3	3.017	2.989	3.003	7.083	0	0	34,000	4,800	Shear
AVERAGE			3.002	7.076	0	0	30,667	4,330	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: FOSROC - DN 116
 Batch id.: Material No. 8

Specimen Age: 3 day
 Avg. Comp. Str. 2,660 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.005	3.020	3.012	7.127	0	0	17,250	2,420	Cone
2	3.014	3.010	3.012	7.126	0	0	19,950	2,800	Shear
3	3.008	3.017	3.013	7.128	0	0	19,750	2,770	Cone
AVERAGE			3.012	7.127	0	0	18,983	2,660	

Specimen Age: 7 day
 Avg. Comp. Str. 3,120 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.009	3.018	3.014	7.132	0	0	23,500	3,290	Cone
2	3.008	3.021	3.015	7.137	0	0	22,500	3,150	Cone
3	3.015	3.013	3.014	7.135	0	0	20,850	2,920	Cone
AVERAGE			3.014	7.135	0	0	22,283	3,120	

Specimen Age: 28 day
 Avg. Comp. Str. 4,060 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.010	3.011	3.010	7.118	0	0	30,000	4,210	Cone
2	3.001	3.016	3.009	7.109	0	0	27,500	3,870	Cone
3	3.013	2.982	2.997	7.056	0	0	29,000	4,110	Cone
AVERAGE			3.005	7.094	0	0	28,833	4,060	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: FOSROC - DN 116
 Batch id.: Material No. 8 - For Second Modulus Tests

Specimen Age: 28 day
 Avg. Comp. Str. 5,780 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.992	2.990	2.991	7.026	0	0	42,000	5,980	Cone/Split
2	3.020	3.003	3.012	7.123	0	0	41,500	5,830	Cone
3	2.983	3.009	2.996	7.050	0	0	39,000	5,530	Cone
AVERAGE			3.000	7.066	0	0	40,833	5,780	

COMPRESSIVE STRENGTH TEST (6" Diameter Cylindrical Specimens)

Product being tested: AMSTONE - MDOT MIX 6
 Batch id.: Material No. 9

Specimen Age: 3 day
 Avg. Comp. Str. 3,050 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.004	2.998	3.001	7.073	0	0	19,750	2,790	Cone
2	2.993	3.004	2.999	7.062	0	0	22,725	3,220	Cone
3	2.980	3.003	2.992	7.029	0	0	22,125	3,150	Cone
AVERAGE			2.997	7.054	0	0	21,533	3,050	

Specimen Age: 7 day
 Avg. Comp. Str. 3,740 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.996	3.016	3.006	7.097	0	0	27,650	3,900	Cone
2	2.982	3.025	3.003	7.085	0	0	25,950	3,660	Cone
3	3.014	3.015	3.015	7.138	0	0	26,150	3,660	Cone
AVERAGE			3.008	7.106	0	0	26,583	3,740	

Specimen Age: 28 day
 Avg. Comp. Str. 4,780 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.995	3.011	3.003	7.082	0	0	33,500	4,730	Cone
2	3.000	3.000	3.000	7.070	0	0	33,500	4,740	Cone
3	3.010	3.000	3.005	7.092	0	0	34,500	4,860	Cone
AVERAGE			3.003	7.081	0	0	33,833	4,780	

COMPRESSIVE STRENGTH TEST (6" Diameter Cylindrical Specimens)

Product being tested: AMSTONE - MDOT MIX 6
 Batch id.: Material No. 9

Specimen Age: 3 day
 Avg. Comp. Str. 5,110 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	5.975	5.975	5.975	28.039	0	0	141,000	5,030	Cone
2	5.975	5.985	5.980	28.086	0	0	146,000	5,200	Cone
3	5.970	5.990	5.980	28.086	0	0	143,000	5,090	Cone
AVERAGE			5.978	28.071	0	0	143,333	5,110	

Specimen Age: 7 day
 Avg. Comp. Str. 5,160 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	5.985	5.995	5.990	28.180	0	0	145,000	5,150	Cone
2	5.965	6.025	5.995	28.227	0	0	146,000	5,170	Cone
AVERAGE			5.993	28.204	0	0	145,500	5,160	

Specimen Age: 28 day
 Avg. Comp. Str. 6,600 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	5.965	5.975	5.970	27.992	0	0	186,500	6,660	Cone
2	5.950	5.965	5.958	27.875	0	0	188,500	6,760	Cone/Split
3	5.980	6.000	5.990	28.180	0	0	180,000	6,390	Cone
AVERAGE			5.973	28.016	0	0	185,000	6,600	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested:

MASTER BUILDERS - EMACO R310
Batch id.: Material No. 10 (Batch A)

Specimen Age: 3 day

Avg. Comp. Str. 3,630 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.010	2.986	2.998	7.057	0	0	26,000	3,680	Cone
2	2.993	3.012	3.003	7.081	0	0	25,500	3,600	Cone
3	3.002	3.002	3.002	7.077	0	0	25,500	3,600	Cone
AVERAGE			3.001	7.072	0	0	25,667	3,630	

Specimen Age: 7 day

Avg. Comp. Str. 3,970 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.001	3.004	3.003	7.080	0	0	27,500	3,880	Cone
2	3.009	3.009	3.009	7.111	0	0	29,500	4,150	Cone/Shear
3	3.014	2.987	3.001	7.071	0	0	27,500	3,890	Cone
AVERAGE			3.004	7.087	0	0	28,167	3,970	

Specimen Age: 28 day

Avg. Comp. Str. 5,230 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.009	2.998	3.003	7.083	0	0	39,000	5,510	Cone
2	3.000	3.000	3.000	7.068	0	0	37,000	5,240	Cone
3	2.995	3.008	3.002	7.076	0	0	35,000	4,950	Cone
AVERAGE			3.001	7.075	0	0	37,000	5,230	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: MASTER BUILDERS - EMACO R310
Batch id.: Material No. 10 (Batch B)

Specimen Age: 3 day
 Avg. Comp. Str. 3,830 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.000	2.997	2.999	7.062	0	0	28,200	3,990	Cone/Shear
2	2.996	3.017	3.007	7.100	0	0	25,950	3,660	Cone
AVERAGE			3.003	7.081	0	0	27,075	3,830	

Specimen Age: 7 day
 Avg. Comp. Str. 3,780 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.003	2.998	3.001	7.071	0	0	28,500	4,030	Cone
2	3.004	3.002	3.003	7.082	0	0	25,000	3,530	Cone
AVERAGE			3.002	7.077	0	0	26,750	3,780	

Specimen Age: 28 day
 Avg. Comp. Str. 5,020 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.017	2.987	3.002	7.077	0	0	37,000	5,230	Cone
2	3.001	3.041	3.021	7.167	0	0	34,500	4,810	Shear
AVERAGE			3.011	7.122	0	0	35,750	5,020	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: MASTER BUILDERS - EMACO R310
 Batch id.: Material No. 10

Specimen Age: 3 day
 Avg. Comp. Str. 4,470 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	5.980	5.985	5.983	28.110	0	0	122,500	4,360	Cone
2	6.005	5.975	5.990	28.180	0	0	126,000	4,470	Cone
3	5.975	5.995	5.985	28.133	0	0	128,500	4,570	Cone
AVERAGE			5.986	28.141	0	0	125,667	4,470	

Specimen Age: 7 day
 Avg. Comp. Str. 4,900 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	5.985	5.975	5.980	28.086	0	0	136,000	4,840	Cone
2	5.995	5.975	5.985	28.133	0	0	136,000	4,830	Cone
3	5.975	6.000	5.988	28.157	0	0	141,500	5,030	Cone
AVERAGE			5.984	28.125	0	0	137,833	4,900	

Specimen Age: 28 day
 Avg. Comp. Str. 6,240 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	5.965	6.000	5.983	28.110	0	0	176,500	6,280	Cone
2	5.985	5.975	5.980	28.086	0	0	177,500	6,320	Cone/Split
3	5.964	6.015	5.990	28.175	0	0	172,500	6,120	Columnar
AVERAGE			5.984	28.124	0	0	175,500	6,240	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested: MASTER BUILDERS - EMACO SR-66
 Batch id.: Material No. 11

Specimen Age: 3 day
 Avg. Comp. Str. 5,520 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.001	3.008	3.004	7.089	0	0	40,000	5,640	Cone
2	3.006	3.007	3.006	7.099	0	0	39,000	5,490	Cone
3	3.002	3.004	3.003	7.084	0	0	38,500	5,430	Cone
AVERAGE			3.005	7.090	0	0	39,167	5,520	

Specimen Age: 7 day
 Avg. Comp. Str. 6,550 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.005	3.007	3.006	7.097	0	0	46,500	6,550	Cone
2	2.980	3.012	2.996	7.049	0	0	45,000	6,380	Cone
3	2.988	3.017	3.003	7.082	0	0	47,500	6,710	Cone
AVERAGE			3.002	7.076	0	0	46,333	6,550	

Specimen Age: 28 day
 Avg. Comp. Str. 9,620 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.994	3.006	3.000	7.069	0	0	67,500	9,550	Cone
2	3.000	3.000	3.000	7.069	0	0	68,000	9,620	Cone
3	2.996	3.008	3.002	7.078	0	0	68,500	9,680	Cone
AVERAGE			3.001	7.072	0	0	68,000	9,620	

COMPRESSIVE STRENGTH TEST (3" Diameter Cylindrical Specimens)

Product being tested:

SIKA - SIKATOP 111

Batch id.: Material No. 12

Specimen Age: 3 day

Avg. Comp. Str. = 3,710 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.019	2.956	2.988	7.010	0	0	25,500	3,640	Cone
2	2.965	2.993	2.979	6.970	0	0	26,500	3,800	Cone
3	2.992	2.995	2.993	7.037	0	0	26,000	3,690	Cone
AVERAGE			2.987	7.006	0	0	26,000	3,710	

Specimen Age: 7 day

Avg. Comp. Str. = 4,890 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	2.994	3.001	2.998	7.057	0	0	34,500	4,890	Cone
2	3.008	2.996	3.002	7.078	0	0	34,500	4,870	Cone
3	2.995	2.995	2.995	7.046	0	0	34,500	4,900	Cone
AVERAGE			2.998	7.060	0	0	34,500	4,890	

Specimen Age: 28 day

Avg. Comp. Str. = 6,940 psi

Specimen Number	First Diameter (in.)	Second Diameter (in.)	Average Diameter (in.)	Sectional Area (sq in.)	Number of Voids	Total Area of Voids (sq in.)	Failure Load (lb)	Compressive Strength (psi)	Fracture Comments
1	3.015	2.962	2.989	7.015	0	0	49,000	6,990	Cone
2	3.001	2.976	2.989	7.014	0	0	48,000	6,840	Cone/Shear
3	2.978	3.001	2.989	7.019	0	0	49,000	6,980	Cone
AVERAGE			2.989	7.016	0	0	48,667	6,940	

Appendix C Flexural Strength Data (ASTM C 78 (1994b))¹

¹ References listed at end of main text.

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: FOSROC - PATCHROC 10 - 60
 Batch id. Material No. 1

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: FOSROC - PATCHROC 10 - 60
 Batch id. Material No. 1

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 9,368.0 (g)
 W/M: 0.138

Curing: Curing Compound
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.137	---	5.984	---	---	---	---	NONE
	6.202	6.169	5.996	5.995	18.0	6,170	501	
	6.168	---	6.004	---	---	---	---	
2	6.157	---	5.995	---	---	---	---	NONE
	6.209	6.195	6.006	6.005	18.0	5,870	473	
	6.219	---	6.013	---	---	---	---	
3	6.036	---	6.150	---	---	---	---	NONE
	6.044	6.020	6.097	6.115	18.0	5,570	445	
	5.979	---	6.097	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							473	psi

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 9,368.0 (g)
 W/M: 0.138

Curing: Curing Compound
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.073	---	6.072	---	---	---	---	NONE
	6.071	6.063	6.072	6.066	18.0	5,270	425	
	6.045	---	6.054	---	---	---	---	
2	6.112	---	6.023	---	---	---	---	NONE
	6.106	6.094	6.054	6.068	18.0	4,520	363	
	6.064	---	6.127	---	---	---	---	
3	6.108	---	6.079	---	---	---	---	NONE
	6.151	6.132	6.034	6.052	18.0	5,170	414	
	6.137	---	6.042	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							401	psi

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 9,368.0 (g)
 W/M: 0.138

Curing: Curing Compound
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.103	---	6.171	---	---	---	---	NONE
	6.099	6.086	6.103	6.098	18.0	3,570	284	
	6.054	---	6.020	---	---	---	---	
2	6.067	---	6.002	---	---	---	---	NONE
	6.072	6.068	5.996	5.994	18.0	3,570	295	
	6.064	---	5.985	---	---	---	---	
3	6.091	---	5.999	---	---	---	---	NONE
	6.087	6.085	6.011	6.008	18.0	3,520	288	
	6.077	---	6.014	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							289	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: METROMIX 240
Batch id. Material No. 2

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: METROMIX 240
Batch id. Material No. 2

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 9,727.5 (g)
 W/M: 0.089

Curing: 3 Days Wet Cure
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	5.968	---	5.961	---	---	---	---	NONE
	5.933	5.984	5.963	5.962	18.0	6,520	552	
	6.052	---	5.962	---	---	---	---	
2	6.064	---	5.981	---	---	---	---	NONE
	6.070	6.059	5.992	5.985	18.0	6,770	562	
	6.042	---	5.982	---	---	---	---	
3	6.182	---	5.995	---	---	---	---	NONE
	6.112	6.156	6.024	6.025	18.0	7,020	565	
	6.173	---	6.056	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							560	psi

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 9,727.5 (g)
 W/M: 0.089

Curing: 3 Days Wet Cure
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	5.968	---	6.038	---	---	---	---	NONE
	5.966	5.952	6.046	6.042	18.0	6,320	524	
	5.921	---	6.041	---	---	---	---	
2	6.040	---	5.930	---	---	---	---	NONE
	6.095	6.091	5.888	5.911	18.0	6,470	547	
	6.138	---	5.915	---	---	---	---	
3	6.001	---	5.978	---	---	---	---	NONE
	6.022	6.024	5.978	5.978	18.0	6,070	508	
	6.050	---	5.977	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							526	psi

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 9,727.5 (g)
 W/M: 0.089

Curing: 3 Days Wet Cure
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.025	---	6.047	---	---	---	---	NONE
	6.013	6.022	6.044	6.048	18.0	6,170	504	
	6.027	---	6.053	---	---	---	---	
2	6.008	---	5.986	---	---	---	---	NONE
	5.984	5.993	5.985	5.985	18.0	6,020	505	
	5.986	---	5.985	---	---	---	---	
3	5.938	---	6.016	---	---	---	---	NONE
	5.968	5.968	6.036	6.052	18.0	3,970	327	
	5.997	---	6.104	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							445	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: CONPROCO - ONE SHOT
Batch id. Material No. 3

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: CONPROCO - ONE SHOT
Batch id. Material No. 3

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 10,409.1 (g)
 W/M: 0.096

Curing: 3 Days Wet Cure
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.036	---	6.029	---	---	---	---	NONE
	6.022	6.019	6.091	6.090	18.0	3,920	316	
	5.999	---	6.151	---	---	---	---	
2	6.072	---	5.977	---	---	---	---	NONE
	6.090	6.080	5.982	5.981	18.0	3,920	324	
	6.077	---	5.985	---	---	---	---	
3	6.101	---	5.983	---	---	---	---	NONE
	6.134	6.109	5.982	5.989	18.0	4,220	347	
	6.091	---	6.003	---	---	---	---	
Average Modulus of Rupture (Flexural Strength)=							329	psi

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 10,882.3 (g)
 W/M: 0.100

Curing: 3 Days Wet Cure
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.049	---	6.058	---	---	---	---	NONE
	6.067	6.059	6.061	6.053	18.0	4,920	399	
	6.060	---	6.040	---	---	---	---	
2	6.019	---	6.105	---	---	---	---	NONE
	6.060	6.046	6.060	6.066	18.0	4,170	337	
	6.059	---	6.033	---	---	---	---	
3	6.092	---	5.996	---	---	---	---	NONE
	6.111	6.092	6.011	6.027	18.0	4,620	376	
	6.073	---	6.075	---	---	---	---	
Average Modulus of Rupture (Flexural Strength)=							371	psi

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 9,936.0 (g)
 W/M: 0.091

Curing: 3 Days Wet Cure
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.118	---	6.054	---	---	---	---	NONE
	6.135	6.115	6.046	6.050	18.0	5,270	424	
	6.094	---	6.049	---	---	---	---	
2	6.051	---	6.030	---	---	---	---	NONE
	6.125	6.099	6.043	6.058	18.0	5,170	416	
	6.122	---	6.100	---	---	---	---	
3	6.062	---	6.028	---	---	---	---	NONE
	6.077	6.055	6.070	6.064	18.0	5,220	422	
	6.025	---	6.094	---	---	---	---	
Average Modulus of Rupture (Flexural Strength)=							421	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: FIVE STAR - STRUCTURAL CONCRETE
Batch id. Material No. 4

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: FIVE STAR - STRUCTURAL CONCRETE
Batch id. Material No. 4

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 10,408.5 (g)
 W/M: 0.153

Curing: 3 Days Wet Cure
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.105	---	5.978	---	---	---	---	NONE
	6.078	6.076	5.983	5.983	18.0	11,870	982	
	6.045	---	5.988	---	---	---	---	
2	6.095	---	6.038	---	---	---	---	NONE
	6.070	6.081	6.082	6.085	18.0	14,020	1,121	
	6.077	---	6.134	---	---	---	---	
3	6.022	---	5.980	---	---	---	---	NONE
	6.074	6.074	5.993	5.985	18.0	11,620	961	
	6.125	---	5.982	---	---	---	---	
Average Modulus of Rupture (Flexural Strength)=							1,022	psi

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 9,462.3 (g)
 W/M: 0.139

Curing: 3 Days Wet Cure
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.042	---	5.967	---	---	---	---	NONE
	6.053	6.045	5.978	5.981	18.0	8,470	705	
	6.041	---	5.999	---	---	---	---	
2	5.970	---	5.976	---	---	---	---	NONE
	6.002	5.993	5.981	5.979	18.0	8,270	695	
	6.007	---	5.981	---	---	---	---	
3	6.037	---	5.985	---	---	---	---	NONE
	6.038	6.040	5.989	5.989	18.0	8,570	712	
	6.046	---	5.994	---	---	---	---	
Average Modulus of Rupture (Flexural Strength)=							704	psi

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 9,462.3 (g)
 W/M: 0.139

Curing: 3 Days Wet Cure
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.096	---	6.161	---	---	---	---	NONE
	6.085	6.089	6.045	6.071	18.0	9,770	784	
	6.086	---	6.006	---	---	---	---	
2	6.084	---	6.075	---	---	---	---	NONE
	6.079	6.070	6.038	6.052	18.0	9,820	795	
	6.045	---	6.043	---	---	---	---	
3	6.072	---	6.144	---	---	---	---	NONE
	6.072	6.069	6.090	6.083	18.0	9,470	759	
	6.063	---	6.015	---	---	---	---	
Average Modulus of Rupture (Flexural Strength)=							779	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: CORMIX - FasTrak Patch
Batch id. Material No. 5

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: CORMIX - FasTrak Patch
Batch id. Material No. 5

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 40,860.0 (g)
 Water: 15,140.0 (g)
 W/M: 0.222

Curing: 7 Days Wet Cure
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.080	---	5.973	---	---	---	---	NONE
	6.088	6.084	5.978	5.979	18.0	9,420	780	
	6.082	---	5.986	---	---	---	---	
2	6.046	---	5.983	---	---	---	---	NONE
	6.038	6.044	5.864	5.943	18.0	10,370	875	
	6.048	---	5.981	---	---	---	---	
3	5.973	---	6.148	---	---	---	---	NONE
	6.004	5.987	6.109	6.098	18.0	11,620	939	
	5.984	---	6.036	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							865	psi

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 40,860.0 (g)
 Water: 15,140.0 (g)
 W/M: 0.222

Curing: 7 Days Wet Cure
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.015	---	6.028	---	---	---	---	NONE
	6.035	6.037	6.022	6.026	18.0	8,870	728	
	6.061	---	6.029	---	---	---	---	
2	6.022	---	6.333	---	---	---	---	NONE
	6.021	6.019	6.029	6.130	18.0	10,020	797	
	6.013	---	6.029	---	---	---	---	
3	6.039	---	6.046	---	---	---	---	NONE
	6.017	6.018	6.057	6.063	18.0	8,470	689	
	5.998	---	6.085	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							738	psi

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 40,860.0 (g)
 Water: 15,140.0 (g)
 W/M: 0.222

Curing: 7 Days Wet Cure
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.008	---	6.029	---	---	---	---	NONE
	6.006	6.002	6.040	6.032	18.0	9,670	797	
	5.991	---	6.027	---	---	---	---	
2	6.137	---	6.011	---	---	---	---	NONE
	6.171	6.151	6.043	6.055	18.0	9,220	736	
	6.146	---	6.111	---	---	---	---	
3	6.194	---	6.019	---	---	---	---	NONE
	6.202	6.185	6.058	6.062	18.0	9,370	742	
	6.159	---	6.109	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							758	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: SR - 93 EUCLID CHEMICAL COMPANY
Batch id. Material No. 6

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: SR - 93 EUCLID CHEMICAL COMPANY
Batch id. Material No. 6

Mixture Data: Dry Repair Material: 90,800.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 8,800.0 (g)
 W/M: 0.097

Curing: 7 Days Wet Cure
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	5.990	---	5.925	---	---	---	---	NONE
	6.007	6.009	5.936	5.935	18.0	6,020	512	
	6.029	---	5.943	---	---	---	---	
2	6.058	---	5.981	---	---	---	---	NONE
	6.051	6.050	6.009	5.993	18.0	6,070	503	
	6.040	---	5.989	---	---	---	---	
3	5.973	---	5.957	---	---	---	---	NONE
	5.982	5.992	5.935	5.942	18.0	6,520	555	
	6.022	---	5.933	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							523	psi

Mixture Data: Dry Repair Material: 90,800.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 8,800.0 (g)
 W/M: 0.097

Curing: 7 Days Wet Cure
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.021	---	5.974	---	---	---	---	NONE
	6.057	6.032	5.971	5.972	18.0	7,770	650	
	6.018	---	5.972	---	---	---	---	
2	5.957	---	5.959	---	---	---	---	NONE
	5.959	5.969	5.978	5.987	18.0	8,270	696	
	5.990	---	6.025	---	---	---	---	
3	5.973	---	6.112	---	---	---	---	NONE
	5.989	5.973	6.072	6.075	18.0	7,920	647	
	5.956	---	6.042	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							664	psi

Mixture Data: Dry Repair Material: 90,800.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 8,800.0 (g)
 W/M: 0.097

Curing: 7 Days Wet Cure
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.043	---	6.037	---	---	---	---	NONE
	6.038	6.036	6.055	6.052	18.0	6,270	511	
	6.026	---	6.064	---	---	---	---	
2	6.099	---	6.097	---	---	---	---	NONE
	6.099	6.098	6.049	6.082	18.0	5,670	452	
	6.097	---	6.099	---	---	---	---	
3	5.965	---	6.031	---	---	---	---	NONE
	5.972	5.978	6.044	6.023	18.0	6,220	516	
	5.998	---	5.994	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							493	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: CONPROCO: CONPRO - SET
Batch id. Material No. 7

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: CONPROCO: CONPRO - SET
Batch id. Material No. 7

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 16,323.0 (g)
 W/M: 0.240

Curing: Laboratory Ambient
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.125	---	6.070	---	---	---	---	NONE
	6.138	6.124	6.087	6.072	18.0	3,570	285	
	6.109	---	6.059	---	---	---	---	
2	6.111	---	6.060	---	---	---	---	NONE
	6.134	6.119	6.058	6.063	18.0	3,470	278	
	6.113	---	6.070	---	---	---	---	
3	6.133	---	6.114	---	---	---	---	NONE
	6.134	6.126	6.064	6.070	18.0	4,020	321	
	6.111	---	6.032	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							294	psi

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 16,323.0 (g)
 W/M: 0.240

Curing: Laboratory Ambient
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.084	---	5.978	---	---	---	---	NONE
	6.098	6.096	5.989	5.981	18.0	6,320	522	
	6.106	---	5.975	---	---	---	---	
2	6.013	---	6.139	---	---	---	---	NONE
	6.019	6.018	6.088	6.083	18.0	4,570	369	
	6.021	---	6.024	---	---	---	---	
3	6.118	---	5.982	---	---	---	---	NONE
	6.169	6.133	5.986	5.983	18.0	4,220	346	
	6.112	---	5.980	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							412	psi

Mixture Data: Dry Repair Material: 68,100.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 16,323.0 (g)
 W/M: 0.240

Curing: Laboratory Ambient
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.072	---	6.056	---	---	---	---	NONE
	6.109	6.093	6.092	6.077	18.0	4,270	342	
	6.100	---	6.084	---	---	---	---	
2	6.148	---	6.019	---	---	---	---	NONE
	6.240	6.207	6.080	6.090	18.0	4,620	361	
	6.234	---	6.170	---	---	---	---	
3	6.118	---	6.037	---	---	---	---	NONE
	6.212	6.168	6.055	6.063	18.0	4,950	393	
	6.173	---	6.097	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							365	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: FOSROC DN-116
Batch id. Material No. 8

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: FOSROC DN-116
Batch id. Material No. 8

Mixture Data: Dry Repair Material: 81,720.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 14,666.9 (g)
 W/M: 0.179

Curing : Laboratory Ambient w/ Curing Compound
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.149	---	6.003	---	---	---	---	NONE
	6.141	6.125	6.023	6.009	18.0	3,270	266	
	6.086	---	6.002	---	---	---	---	
2	6.124	---	6.076	---	---	---	---	NONE
	6.168	6.153	6.052	6.068	18.0	3,120	248	
	6.166	---	6.076	---	---	---	---	
3	6.169	---	5.992	---	---	---	---	NONE
	6.194	6.163	6.000	5.989	18.0	3,720	303	
	6.125	---	5.974	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							272	psi

Mixture Data: Dry Repair Material: 81,720.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 13,769.4 (g)
 W/M: 0.168

Curing : Laboratory Ambient w/ Curing Compound
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	5.997	---	6.131	---	---	---	---	NONE
	6.011	6.028	6.068	6.075	18.0	3,320	269	
	6.075	---	6.025	---	---	---	---	
2	5.975	---	5.995	---	---	---	---	NONE
	6.095	6.091	5.970	5.970	18.0	3,620	300	
	6.203	---	5.945	---	---	---	---	
3	6.068	---	6.110	---	---	---	---	NONE
	6.080	6.072	6.088	6.085	18.0	3,120	250	
	6.067	---	6.057	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							273	psi

Mixture Data: Dry Repair Material: 81,720.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 14,242.5 (g)
 W/M: 0.174

Curing : Laboratory Ambient w/ Curing Compound
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.078	---	6.103	---	---	---	---	NONE
	6.077	6.075	6.055	6.067	18.0	2,170	175	
	6.069	---	6.042	---	---	---	---	
2	6.004	---	6.058	---	---	---	---	NONE
	6.010	6.021	6.082	6.071	18.0	1,520	123	
	6.050	---	6.073	---	---	---	---	
3	6.088	---	6.081	---	---	---	---	NONE
	6.084	6.088	6.045	6.060	18.0	1,470	118	
	6.091	---	6.055	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							139	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: AMERICAN STONE - MIX, INC.: MIX #6
Batch id. Material No. 9

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: AMERICAN STONE - MIX, INC.: MIX #6
Batch id. Material No. 9

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 11,355.0 (g)
 W/M: 0.104

Curing: 7 Days Wet Cure
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.015	---	5.977	---	---	---	---	NONE
	6.022	6.016	5.981	5.983	18.0	6,020	503	
	6.010	---	5.992	---	---	---	---	
2	6.012	---	6.152	---	---	---	---	NONE
	6.055	6.040	6.098	6.088	18.0	6,820	548	
	6.052	---	6.015	---	---	---	---	
3	6.040	---	5.990	---	---	---	---	NONE
	6.070	6.057	5.968	5.978	18.0	6,670	555	
	6.060	---	5.975	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							535	psi

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 11,355.0 (g)
 W/M: 0.104

Curing: 7 Days Wet Cure
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.015	---	6.040	---	---	---	---	NONE
	6.011	6.050	6.066	6.081	18.0	8,120	653	
	6.125	---	6.137	---	---	---	---	
2	6.059	---	5.993	---	---	---	---	NONE
	6.051	6.058	6.024	6.032	18.0	8,270	675	
	6.065	---	6.080	---	---	---	---	
3	6.117	---	6.081	---	---	---	---	NONE
	6.084	6.076	6.038	6.043	18.0	7,670	622	
	6.028	---	6.011	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							650	psi

Mixture Data: Dry Repair Material: 108,960.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 9,462.5 (g)
 W/M: 0.087

Curing: 7 Days Wet Cure
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.101	---	6.031	---	---	---	---	NONE
	6.129	6.106	6.061	6.063	18.0	4,620	370	
	6.089	---	6.098	---	---	---	---	
2	6.185	---	6.079	---	---	---	---	NONE
	6.224	6.212	6.050	6.062	18.0	6,020	475	
	6.226	---	6.056	---	---	---	---	
3	6.120	---	6.027	---	---	---	---	NONE
	6.171	6.152	6.049	6.056	18.0	5,020	401	
	6.165	---	6.091	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							415	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: MASTER BUILDERS - EMACO R 310
Batch id. Material No. 10

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: MASTER BUILDERS - EMACO R 310
Batch id. Material No. 10

Mixture Data: Dry Repair Material: 74,910.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 9,935.6 (g)
 W/M: 0.133

Curing: 2 Days Wet Cure w/ Curing Compound.
Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.059	---	6.040	---	---	---	---	NONE
	6.043	6.045	6.094	6.090	18.0	9,270	744	
	6.035	---	6.137	---	---	---	---	
2	6.079	---	5.981	---	---	---	---	NONE
	6.125	6.115	5.991	5.985	18.0	9,120	749	
	6.142	---	5.985	---	---	---	---	
3	6.289	---	5.987	---	---	---	---	NONE
	6.292	6.290	5.990	5.995	18.0	9,370	746	
	6.289	---	6.009	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							746	psi

Mixture Data: Dry Repair Material: 74,910.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 8,516.3 (g)
 W/M: 0.114

Curing: 2 Days Wet Cure w/ Curing Compound.
Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.070	---	6.060	---	---	---	---	NONE
	6.064	6.080	6.064	6.071	18.0	6,670	536	
	6.106	---	6.090	---	---	---	---	
2	6.080	---	5.988	---	---	---	---	NONE
	6.108	6.108	6.016	6.044	18.0	6,220	502	
	6.137	---	6.128	---	---	---	---	
3	6.034	---	6.043	---	---	---	---	NONE
	6.022	6.029	6.048	6.056	18.0	6,370	519	
	6.031	---	6.077	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							519	psi

Mixture Data: Dry Repair Material: 74,910.0 (g)
 Aggregate: 34,050.0 (g)
 Water: 8,989.4 (g)
 W/M: 0.120

Curing: 2 Days Wet Cure w/ Curing Compound.
Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.079	---	6.023	---	---	---	---	NONE
	6.054	6.061	6.040	6.061	18.0	5,770	466	
	6.049	---	6.121	---	---	---	---	
2	6.061	---	6.024	---	---	---	---	NONE
	6.065	6.055	6.056	6.068	18.0	7,370	595	
	6.039	---	6.123	---	---	---	---	
3	6.033	---	6.054	---	---	---	---	NONE
	6.050	6.045	6.053	6.059	18.0	5,220	423	
	6.052	---	6.070	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							495	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: MASTER BUILDERS - EMACO S66-CR
Batch id. Material No. 11

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: MASTER BUILDERS - EMACO S66-CR
Batch id. Material No. 11

Mixture Data: Dry Repair Material: 99,880.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 8,516.3 (g)
 W/M: 0.085

Curing: 2 Days Wet Cure w/ Curing Compound.
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.052	---	6.038	---	---	---	---	NONE
	6.103	6.091	6.048	6.042	18.0	7,670	621	
	6.118	---	6.040	---	---	---	---	
2	6.028	---	6.069	---	---	---	---	NONE
	6.064	6.057	6.043	6.048	18.0	7,220	587	
	6.078	---	6.033	---	---	---	---	
3	6.170	---	6.072	---	---	---	---	NONE
	6.158	6.155	6.043	6.051	18.0	7,720	616	
	6.138	---	6.040	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							608	psi

Mixture Data: Dry Repair Material: 99,880.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 8,989.4 (g)
 W/M: 0.090

Curing: 2 Days Wet Cure w/ Curing Compound.
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	5.996	---	6.032	---	---	---	---	NONE
	6.025	6.032	6.091	6.091	18.0	6,570	528	
	6.076	---	6.149	---	---	---	---	
2	6.106	---	5.976	---	---	---	---	NONE
	6.100	6.064	5.979	5.979	18.0	6,420	533	
	5.986	---	5.982	---	---	---	---	
3	6.044	---	5.981	---	---	---	---	NONE
	6.075	6.050	5.985	5.984	18.0	6,920	575	
	6.032	---	5.986	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							546	psi

Mixture Data: Dry Repair Material: 99,880.0 (g)
 Aggregate: 0.0 (g) -No Aggregate Added
 Water: 9,462.5 (g)
 W/M: 0.095

Curing: 2 Days Wet Cure w/ Curing Compound.
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.052	---	6.005	---	---	---	---	NONE
	6.027	6.012	6.017	6.028	18.0	5,970	492	
	5.958	---	6.063	---	---	---	---	
2	6.075	---	6.045	---	---	---	---	NONE
	6.106	6.068	6.049	6.048	18.0	6,570	533	
	6.024	---	6.050	---	---	---	---	
3	6.161	---	6.018	---	---	---	---	NONE
	6.156	6.150	6.049	6.063	18.0	6,070	483	
	6.133	---	6.121	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =							503	psi

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: SIKA TOP III
Batch id. Material No. 12

FLEXURAL STRENGTH TEST (ASTM C - 78, 6" Square by 21" Beam Specimens)

Product being tested: SIKA TOP III
Batch id. Material No. 12

Mixture Data: Component B: 55,842.0 (g)
 Aggregate: 36,292.8 (g)
 Component A: 7,570.0 (g)
 W/M: 0.136

Curing: 7 Days Wet Burlap
 Specimen Age: 3 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.080	---	5.981	---	---	---	---	NONE
	6.142	6.123	6.002	5.991	18.0	9,570	784	
	6.146	---	5.992	---	---	---	---	
2	6.109	---	5.981	---	---	---	---	NONE
	6.124	6.132	6.019	5.993	18.0	9,070	741	
	6.163	---	5.978	---	---	---	---	
3	6.041	---	6.024	---	---	---	---	NONE
	6.118	6.077	6.072	6.079	18.0	8,570	687	
	6.072	---	6.140	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =						737	psi	

Mixture Data: Component B: 55,842.0 (g)
 Aggregate: 38,136.0 (g)
 Component A: 7,570.0 (g)
 W/M: 0.136

Curing: 7 Days Wet Burlap
 Specimen Age: 7 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.091	---	5.992	---	---	---	---	NONE
	6.151	6.131	5.982	5.984	18.0	9,170	752	
	6.151	---	5.978	---	---	---	---	
2	6.168	---	5.972	---	---	---	---	NONE
	6.202	6.161	5.986	5.979	18.0	9,120	745	
	6.114	---	5.980	---	---	---	---	
3	6.124	---	6.082	---	---	---	---	NONE
	6.138	6.130	6.038	6.036	18.0	8,220	662	
	6.128	---	5.989	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =						720	psi	

Mixture Data: Component B: 55,842.0 (g)
 Aggregate: 38,136.0 (g)
 Component A: 7,570.0 (g)
 W/M: 0.136

Curing: 7 Days Wet Burlap
 Specimen Age: 28 Days

Specimen Number	Dimensions					Failure Load (lb)	Modulus of Rupture (psi)	Defects Noted:
	Width (in.)	Avg. Width (in.)	Height (in.)	Avg. Height (in.)	Span Length (in.)			
1	6.034	---	6.028	---	---	---	---	NONE
	6.090	6.075	6.078	6.082	18.0	9,220	738	
	6.100	---	6.141	---	---	---	---	
2	6.099	---	6.027	---	---	---	---	NONE
	6.136	6.113	6.057	6.080	18.0	10,520	838	
	6.105	---	6.156	---	---	---	---	
3	6.072	---	6.024	---	---	---	---	NONE
	6.063	6.043	6.043	6.035	18.0	10,270	840	
	5.995	---	6.037	---	---	---	---	
Average Modulus of Rupture (Flexural Strength) =						805	psi	

Appendix D

Tensile Strength Data

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: FOSROC - PATCHROC 10-60

Batch id.: Material No. 1

Specimen Age: 3 DayAvg. Tensile Str.= 388 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	2.030	1.990	1.850	1.957	3.020	3.030	3.025	5.919	2,252	380
2	1.900	1.930	1.960	1.930	3.130	3.110	3.120	6.022	2,382	396
AVERAGE				1.943			3.073	5.970	2,317	388

Specimen Age: 7 DayAvg. Tensile Str.= 366 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.980	2.060	2.070	2.037	3.100	3.090	3.095	6.303	1,530	243
2	1.900	1.920	1.910	1.910	3.090	3.080	3.085	5.892	2,894	491
3	1.990	2.030	2.110	2.043	3.040	3.040	3.040	6.212	2,258	364
AVERAGE				1.997			3.073	6.136	2,227	366

Specimen Age: 28 DayAvg. Tensile Str.= 451 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.940	1.920	1.930	1.930	3.110	3.100	3.105	5.993	2,832	473
2	1.970	1.970	1.930	1.957	3.070	3.070	3.070	6.007	2,824	470
3	1.940	1.910	1.950	1.933	3.110	3.110	3.110	6.013	2,460	409
AVERAGE				1.940			3.095	6.004	2,705	451

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: AMSTONE - METROMIX 240
 Batch id.: Material No. 2

Specimen Age: 3 Day
 Avg. Tensile Str. = 301 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.850	1.840	1.840	1.843	3.010	3.080	3.045	5.613	1,740	310
2	1.900	1.880	1.900	1.893	3.160	3.130	3.145	5.955	1,900	319
3	1.920	1.910	1.920	1.917	3.070	3.080	3.075	5.894	1,614	274
AVERAGE				1.884			3.088	5.820	1,751	301

Specimen Age: 7 Day
 Avg. Tensile Str. = 318 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.880	1.880	1.890	1.883	3.070	3.060	3.065	5.772	1,428	247
2	1.860	1.860	1.860	1.860	3.080	3.090	3.085	5.738	1,986	346
3	1.990	1.990	1.930	1.970	3.050	3.060	3.055	6.018	2,176	362
AVERAGE				1.904			3.068	5.843	1,863	318

Specimen Age: 28 Day
 Avg. Tensile Str. = 399 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.910	1.890	1.910	1.903	3.100	3.090	3.095	5.891	2,172	369
2	1.870	1.870	1.880	1.873	3.050	3.070	3.060	5.732	2,492	435
3	1.920	1.920	1.910	1.917	3.060	3.060	3.060	5.865	2,308	394
AVERAGE				1.898			3.072	5.829	2,324	399

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch id.: Material No. 3

Specimen Age: 3 DayAvg. Tensile Str. = 194 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	2.000	2.000	2.000	2.000	3.000	3.000	3.000	6.000	1,119	187
2	1.970	1.960	2.020	1.983	3.070	3.070	3.070	6.089	1,174	193
3	1.910	1.840	1.920	1.890	3.020	3.110	3.065	5.793	1,170	202
AVERAGE				1.958			3.045	5.961	1,154	194

Specimen Age: 7 DayAvg. Tensile Str. = 319 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	2.080	2.050	1.960	2.030	3.090	3.090	3.090	6.273	2,364	377
2	1.850	1.860	1.840	1.850	3.100	3.090	3.095	5.726	1,674	292
3	1.990	2.000	1.960	1.983	3.080	3.090	3.085	6.119	1,752	286
AVERAGE				1.954			3.090	6.039	1,930	319

Specimen Age: 28 DayAvg. Tensile Str. = 513 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.970	1.930	1.930	1.943	3.090	3.080	3.085	5.995	2,954	493
2	2.100	1.970	1.910	1.993	3.070	3.080	3.075	6.130	3,096	505
3	1.930	1.980	1.860	1.923	3.090	3.110	3.100	5.962	3,234	542
AVERAGE				1.953			3.087	6.029	3,095	513

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: FIVE STAR - STRUCTURAL CONCRETE
Batch Id.: Material No. 4

Specimen Age: 3 Day
Avg. Tensile Str. = 335 **psi**

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.940	1.950	1.970	1.953	3.040	3.010	3.025	5.909	1,922	325
2	2.050	2.060	2.010	2.040	3.090	3.070	3.080	6.283	1,940	309
3	1.970	1.980	1.940	1.963	3.040	3.060	3.050	5.988	2,230	372
AVERAGE				1.986			3.052	6.060	2,031	335

Specimen Age: 7 Day
Avg. Tensile Str. = 355 **psi**

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.800	1.890	1.920	1.870	3.030	2.990	3.010	5.629	2,366	420
2	1.890	1.860	1.880	1.877	3.060	3.100	3.080	5.780	1,760	304
3	2.020	2.030	2.250	2.100	3.080	3.110	3.095	6.500	2,202	339
AVERAGE				1.949			3.062	5.969	2,109	355

Specimen Age: 28 Day
Avg. Tensile Str. = 360 **psi**

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.890	1.910	1.960	1.920	3.060	3.060	3.060	5.875	1,802	307
2	1.880	1.910	2.060	1.950	3.040	3.060	3.050	5.948	2,200	370
3	1.830	1.820	1.860	1.837	3.080	3.080	3.080	5.657	2,282	403
AVERAGE				1.902			3.063	5.827	2,095	360

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested:

W. R. GRACE - FASTRAK PATCH

Batch id.: Material No. 5

Specimen Age: 3 DayAvg. Tensile Str. = 138 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.960	1.990	1.990	1.980	3.230	3.230	3.230	6.395	958	150
2	2.010	2.000	2.020	2.010	3.220	3.220	3.220	6.472	874	135
3	2.040	2.050	2.140	2.077	3.200	3.190	3.195	6.635	856	129
AVERAGE				2.022			3.215	6.501	896	138

Specimen Age: 7 DayAvg. Tensile Str. = 115 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.980	2.010	2.010	2.000	3.280	3.270	3.275	6.550	768	117
2	2.270	2.130	2.330	2.243	3.260	3.240	3.250	7.291	816	112
AVERAGE				2.122			3.263	6.920	792	115

Specimen Age: 28 DayAvg. Tensile Str. = 94 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	3.000	3.000	3.000	3.000	3.000	3.000	3.000	9.000	866	96
2	3.000	3.000	3.000	3.000	3.000	3.000	3.000	9.000	864	96
3	3.000	3.000	3.000	3.000	3.000	3.000	3.000	9.000	814	90
AVERAGE				3.000			3.000	9.000	848	94

Note: 28 day specimens failed at embedment stud as a result of severe shrinkage cracking. Use 3" x 3" area.

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: EUCLID - SR - 93
 Batch id.: Material No. 6

Specimen Age: 3 Day
 Avg. Tensile Str. = 218 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	2.010	1.950	1.940	1.967	3.090	3.080	3.085	6.067	904	149
2	1.890	1.940	1.990	1.940	3.080	2.780	2.930	5.684	1,126	198
3	1.860	1.800	1.780	1.813	3.060	3.060	3.060	5.549	1,708	308
AVERAGE				1.907			3.025	5.767	1,246	218

Specimen Age: 7 Day
 Avg. Tensile Str. = 232 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.900	1.930	1.860	1.897	3.080	3.060	3.070	5.823	1,706	293
2	1.880	1.840	1.810	1.843	3.060	3.040	3.050	5.622	1,196	213
3	1.870	1.820	1.820	1.837	3.030	3.020	3.025	5.556	1,054	190
AVERAGE				1.859			3.048	5.667	1,319	232

Specimen Age: 28 Day
 Avg. Tensile Str. = 323 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.840	1.830	1.810	1.827	3.030	3.020	3.025	5.526	858	155
2	1.860	1.870	1.830	1.853	3.030	3.050	3.040	5.634	3,346	594
3	1.840	1.860	1.830	1.843	3.050	3.030	3.040	5.604	1,232	220
AVERAGE				1.841			3.035	5.588	1,812	323

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: CONPROCO - CONPRO - SET
 Batch id.: Material No. 7

Specimen Age: 3 Day
 Avg. Tensile Str. = 262 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.910	1.890	1.910	1.903	3.050	3.050	3.050	5.805	1,490	257
2	1.910	1.910	1.890	1.903	3.040	3.040	3.040	5.786	1,478	255
3	1.880	1.870	1.860	1.870	3.060	3.080	3.070	5.741	1,572	274
AVERAGE				1.892			3.053	5.777	1,513	262

Specimen Age: 7 Day
 Avg. Tensile Str. = 302 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.850	1.900	1.860	1.870	3.120	3.120	3.120	5.834	1,534	263
2	1.940	2.260	2.100	2.100	3.130	3.090	3.110	6.531	1,770	271
3	1.900	1.960	1.920	1.927	3.070	3.060	3.065	5.905	2,190	371
AVERAGE				1.966			3.098	6.090	1,831	302

Specimen Age: 28 Day
 Avg. Tensile Str. = 467 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.930	1.930	2.080	1.980	3.100	3.080	3.090	6.118	2,682	438
2	1.800	1.870	2.040	1.903	3.200	3.190	3.195	6.081	3,020	497
3										
AVERAGE				1.942			3.143	6.100	2,851	467

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: FOSROC DN - 116
Batch id.: Material No. 8

Specimen Age: 3 Day
Avg. Tensile Str. = 312 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	2.070	2.120	2.180	2.123	2.950	2.990	2.970	6.306	1,810	287
2	1.850	1.860	1.840	1.850	3.030	3.040	3.035	5.615	2,026	361
3	1.910	1.910	1.910	1.910	3.100	3.070	3.085	5.892	1,694	287
AVERAGE				1.961			3.030	5.938	1,843	312

Specimen Age: 7 Day
Avg. Tensile Str. = 212 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.980	2.070	2.010	2.020	3.070	3.080	3.075	6.212	1,334	215
2	1.940	1.810	1.810	1.853	3.060	3.130	3.095	5.736	1,246	217
3	2.010	2.030	1.950	1.997	3.090	3.110	3.100	6.190	1,270	205
AVERAGE				1.957			3.090	6.046	1,283	212

Specimen Age: 28 Day
Avg. Tensile Str. = 245 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.910	2.080	2.310	2.100	3.110	3.110	3.110	6.531	1,458	223
2	1.840	1.980	2.040	1.953	2.970	3.050	3.010	5.880	1,500	255
3	1.870	1.900	1.950	1.907	3.080	3.140	3.110	5.930	1,514	255
AVERAGE				1.987			3.077	6.113	1,491	245

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: AMSTONE - MDOT MIX #6
 Batch id.: Material No. 9

Specimen Age: 3 Day
 Avg. Tensile Str. = 258 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.870	1.880	1.890	1.880	3.090	3.080	3.085	5.800	1,428	246
2	1.850	1.800	1.830	1.827	3.050	3.050	3.050	5.571	1,386	249
3	1.850	1.910	1.890	1.883	3.100	3.100	3.100	5.838	1,628	279
AVERAGE				1.863			3.078	5.736	1,481	258

Specimen Age: 7 Day
 Avg. Tensile Str. = 202 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	2.020	1.920	1.870	1.937	3.090	3.060	3.075	5.955	1,144	192
2	1.820	1.820	1.800	1.813	3.130	3.100	3.115	5.649	1,050	186
3	1.730	1.750	1.820	1.767	3.090	3.090	3.090	5.459	1,238	227
AVERAGE				1.839			3.093	5.688	1,144	202

Specimen Age: 28 Day
 Avg. Tensile Str. = 323 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.830	1.770	1.810	1.803	3.500	3.050	3.275	5.906	1,458	247
2	1.870	1.860	1.900	1.877	3.040	3.040	3.040	5.705	1,690	296
3	1.770	1.720	1.730	1.740	2.950	2.980	2.965	5.159	2,198	426
AVERAGE				1.807			3.093	5.590	1,782	323

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO R310
 Batch id.: Material No. 10

Specimen Age: 3 Day
 Avg. Tensile Str. = 512 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.920	1.940	1.920	1.927	3.090	3.090	3.090	5.953	3,404	572
2	1.830	1.810	1.800	1.813	3.170	3.060	3.115	5.649	2,846	504
3	1.850	1.850	1.920	1.873	3.080	3.150	3.115	5.835	2,680	459
AVERAGE				1.871			3.107	5.812	2,977	512

Specimen Age: 7 Day
 Avg. Tensile Str. = 409 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.990	2.040	2.040	2.023	3.070	3.030	3.050	6.171	2,444	396
2	1.950	1.910	1.900	1.920	3.090	3.110	3.100	5.952	2,644	444
3	2.060	2.050	2.030	2.047	3.010	3.060	3.035	6.212	2,410	388
AVERAGE				1.997			3.062	6.112	2,499	409

Specimen Age: 28 Day
 Avg. Tensile Str. = 402 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.870	1.870	1.880	1.873	3.130	3.110	3.120	5.845	2,264	387
2	2.380	1.960	1.880	2.073	3.120	3.130	3.125	6.479	2,422	374
3	1.890	1.870	1.880	1.880	3.110	3.100	3.105	5.837	2,600	445
AVERAGE				1.942			3.117	6.054	2,429	402

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested:

MASTER BUILDERS - S66 - CR

Batch id.: Material No. 11

Specimen Age: 3 DayAvg. Tensile Str.= 337 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	2.000	2.000	2.000	2.000	3.000	3.000	3.000	6.000	1,782	297
2	2.000	2.000	2.000	2.000	3.000	3.000	3.000	6.000	2,056	343
3	1.890	1.900	1.890	1.893	3.100	3.110	3.105	5.879	2,188	372
AVERAGE				1.964			3.035	5.960	2,009	337

Specimen Age: 7 DayAvg. Tensile Str.= 369 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.870	1.870	1.880	1.873	3.070	3.080	3.075	5.761	2,232	387
2	1.990	2.070	2.130	2.063	3.040	3.040	3.040	6.273	2,118	338
3	2.080	2.060	2.130	2.090	3.090	3.060	3.075	6.427	2,446	381
AVERAGE				2.009			3.063	6.153	2,265	369

Specimen Age: 28 DayAvg. Tensile Str.= 390 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1										
2	1.890	1.860	1.880	1.877	3.110	3.100	3.105	5.827	2,428	417
3	1.930	1.960	1.940	1.943	3.050	3.030	3.040	5.908	2,144	363
AVERAGE				1.910			3.073	5.867	2,286	390

TENSILE STRENGTH TEST (3" X 3" X 12" Modified Prismatic Specimens)

Product being tested:

SIKA - SIKATOP 111

Batch id.: Material No. 12

Specimen Age: 3 Day

Avg. Tensile Str. = 322 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.850	1.850	1.910	1.870	3.130	3.090	3.110	5.816	1,676	288
2	1.810	1.850	1.870	1.843	3.050	3.070	3.060	5.641	1,886	334
3	1.870	1.880	1.910	1.887	3.100	3.070	3.085	5.820	2,000	344
AVERAGE				1.867			3.085	5.759	1,854	322

Specimen Age: 7 Day

Avg. Tensile Str. = 583 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.860	1.850	1.850	1.853	3.090	3.110	3.100	5.745	3,438	598
2	2.020	1.910	1.900	1.943	3.060	3.060	3.060	5.947	3,196	537
3	1.920	1.920	1.910	1.917	3.070	3.040	3.055	5.855	3,586	612
AVERAGE				1.904			3.072	5.849	3,407	583

Specimen Age: 28 Day

Avg. Tensile Str. = 742 psi

Specimen Number	First Width (in.)	Second Width (in.)	Third Width (in.)	Average Width (in.)	First Depth (in.)	Second Depth (in.)	Average Depth (in.)	Sectional Area (sq in.)	Failure Load (lb)	Tensile Strength (psi)
1	1.900	1.850	1.810	1.853	3.130	3.150	3.140	5.819	4,986	857
2	1.860	1.850	1.850	1.853	3.100	3.120	3.110	5.764	4,156	721
3	2.130	1.990	1.920	2.013	3.150	3.090	3.120	6.282	4,064	647
AVERAGE				1.907			3.123	5.955	4,402	742

Appendix E

Drying Shrinkage Data

(ASTM C 157 (1994d))¹

¹ References listed at end of main text.

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: FOSROC-PATCHROC 10-60
 Batch id.: Material No. 1

Mixture Data: Dry Repair Material: 45,400.0 (g)
 Aggregate: 22,700.0 (g)
 Water: 6,245.0 (g)
 W/M: 0.138

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data									
					Specimen 1		Specimen 2		Specimen 3		Average Length Change (%)			
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)				
1	73	95	0.1263	0.1262	0.1460	---	0.1612	---	0.1831	---	---	---	---	---
6	73	95	0.1258	0.1258	0.1452	-0.0034	0.1604	-0.0041	0.1923	-0.0041	-0.0039	-0.0039	-0.0039	-0.0039
16	73	95	0.1257	0.1257	0.1449	-0.0058	0.1600	-0.0069	0.1920	-0.0058	-0.0062	-0.0062	-0.0062	-0.0062
35	73	95	0.1263	0.1263	0.1442	-0.0174	0.1599	-0.0134	0.1920	-0.0115	-0.0141	-0.0141	-0.0141	-0.0141
65	73	100	0.1257	0.1256	0.1446	-0.0079	0.1603	-0.0034	0.1922	-0.0033	-0.0049	-0.0049	-0.0049	-0.0049
98	72	100	0.1342	0.1342	0.1541	0.0015	0.1698	0.0056	0.2017	0.0057	0.0042	0.0042	0.0042	0.0042
131	72	100	0.1342	0.1342	0.1541	0.0017	0.1696	0.0041	0.2015	0.0043	0.0034	0.0034	0.0034	0.0034
159	70	100	0.1343	0.1341	0.1538	-0.0032	0.1697	0.0052	0.2016	0.0053	0.0024	0.0024	0.0024	0.0024
194	70	95	0.1340	0.1340	0.1532	-0.0052	0.1694	0.0041	0.2013	0.0043	0.0011	0.0011	0.0011	0.0011
222	72	96	0.1340	0.1340	0.1530	-0.0073	0.1692	0.0021	0.2012	0.0032	-0.0006	-0.0006	-0.0006	-0.0006
251	72	95	0.1342	0.1342	0.1532	-0.0073	0.1693	0.0012	0.2012	0.0012	-0.0016	-0.0016	-0.0016	-0.0016
287	72	90	0.1343	0.1343	0.1532	-0.0082	0.1694	0.0012	0.2012	0.0002	-0.0023	-0.0023	-0.0023	-0.0023
310	74	95	0.1336	0.1336	0.1525	-0.0082	0.1688	0.0022	0.2008	0.0033	-0.0009	-0.0009	-0.0009	-0.0009
344	67	93	0.1347	0.1345	0.1532	-0.0112	0.1693	-0.0028	0.2012	-0.0027	-0.0056	-0.0056	-0.0056	-0.0056
372	72	95	0.1344	0.1344	0.1531	-0.0102	0.1693	-0.0008	0.2012	-0.0007	-0.0039	-0.0039	-0.0039	-0.0039
400	70	90	0.1346	0.1345	0.1530	-0.0127	0.1692	-0.0034	0.2011	-0.0032	-0.0064	-0.0064	-0.0064	-0.0064
432	70	89	0.1346	0.1346	0.1529	-0.0142	0.1690	-0.0058	0.2009	-0.0057	-0.0086	-0.0086	-0.0086	-0.0086
461	72	86	0.1336	0.1335	0.1523	-0.0098	0.1685	-0.0003	0.2004	-0.0002	-0.0034	-0.0034	-0.0034	-0.0034
488	70	92	0.1342	0.1342	0.1527	-0.0123	0.1690	-0.0018	0.2009	-0.0018	-0.0053	-0.0053	-0.0053	-0.0053
522	72	86	0.1337	0.1338	0.1523	-0.0118	0.1685	-0.0023	0.2004	-0.0023	-0.0054	-0.0054	-0.0054	-0.0054
560	72	80	0.1337	0.1337	0.1522	-0.0123	0.1683	-0.0038	0.2003	-0.0027	-0.0063	-0.0063	-0.0063	-0.0063

$$\Delta L = \left(\left(L_{XT} - \frac{(L_{RTI} + L_{RTI})}{2} \right) - \left(L_{XO} - \frac{(L_{ROI} + L_{ROI})}{2} \right) \right) \times \frac{100}{10}$$

WHERE: ΔL = Length Change (percent)
 L_{XO} = Reading of Specimen at Casting
 L_{XT} = Reading of Specimen at Time T
 L_{ROI} = Reading of Reference Bar at Casting, Initial.
 L_{ROF} = Reading of Reference Bar at Casting, Final.
 L_{RTI} = Reading of Reference Bar at Time T, Initial.
 L_{RTF} = Reading of Reference Bar at Time T, Final.

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: F O S R O C - P A T C H R O C 10 - 60

Batch Id.: Material No. 1

Mixture Data: Dry Repair Material: 45,400.0 (g)
 Aggregate: 22,700.0 (g)
 Water: 6,245.0 (g)
 W/M: 0.138

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Specimen 3	
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	50	0.1263	0.1262	0.1462	---	0.1455	---	0.1503	---
6	72	55	0.1258	0.1258	0.1454	-0.0046	0.1446	-0.0055	0.1495	-0.0038
16	73	48	0.1257	0.1257	0.1445	-0.0120	0.1436	-0.0145	0.1488	-0.0099
35	70	37	0.1263	0.1263	0.1441	-0.0219	0.1433	-0.0226	0.1484	-0.0192
65	74	45	0.1257	0.1256	0.1432	-0.0241	0.1425	-0.0248	0.1474	-0.0230
98	72	55	0.1342	0.1342	0.1517	-0.0255	0.1509	-0.0262	0.1562	-0.0210
131	72	46	0.1342	0.1342	0.1514	-0.0279	0.1505	-0.0300	0.1557	-0.0260
159	70	45	0.1343	0.1341	0.1513	-0.0288	0.1504	-0.0309	0.1556	-0.0270
194	70	52	0.1340	0.1340	0.1513	-0.0289	0.1505	-0.0280	0.1557	-0.0240
222	68	54	0.1340	0.1340	0.1513	-0.0269	0.1505	-0.0280	0.1557	-0.0240
251	68	55	0.1342	0.1342	0.1515	-0.0269	0.1508	-0.0270	0.1559	-0.0240
287	68	55	0.1343	0.1343	0.1515	-0.0279	0.1506	-0.0299	0.1558	-0.0260
310	68	51	0.1336	0.1336	0.1510	-0.0259	0.1503	-0.0260	0.1554	-0.0229
344	66	41	0.1347	0.1345	0.1514	-0.0318	0.1506	-0.0329	0.1558	-0.0290
372	69	47	0.1344	0.1344	0.1514	-0.0298	0.1506	-0.0309	0.1558	-0.0270
400	68	42	0.1346	0.1345	0.1513	-0.0324	0.1504	-0.0345	0.1556	-0.0305
432	69	25	0.1346	0.1346	0.1508	-0.0379	0.1501	-0.0379	0.1553	-0.0340
461	67	40	0.1336	0.1335	0.1504	-0.0313	0.1497	-0.0315	0.1548	-0.0285
488	65	49	0.1342	0.1342	0.1512	-0.0299	0.1504	-0.0310	0.1556	-0.0270
522	71	60	0.1337	0.1338	0.1510	-0.0274	0.1503	-0.0275	0.1554	-0.0245
560	70	53	0.1337	0.1337	0.1512	-0.0249	0.1505	-0.0250	0.1556	-0.0220

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: FOSROC-PATCHROC 10-60
Batch id.: Material No. 1

Mixture Data: Dry Repair Material: 45,400.0 (g)
Aggregate: 22,700.0 (g)
Water: 6,245.0 (g)
W/M: 0.138

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data						Average Length Change (%)
					Specimen 1		Specimen 2		Specimen 3		
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	73	20	0.1263	0.1262	0.1375	---	0.1492	---	0.1491	---	---
6	73	20	0.1258	0.1258	0.1366	-0.0056	0.1479	-0.0088	0.1481	-0.0066	-0.0070
16	73	20	0.1257	0.1257	0.1356	-0.0143	0.1470	-0.0164	0.1473	-0.0134	-0.0147
35	73	20	0.1263	0.1263	0.1352	-0.0232	0.1465	-0.0265	0.1468	-0.0238	-0.0245
65	73	20	0.1257	0.1256	0.1340	-0.0292	0.1458	-0.0279	0.1455	-0.0301	-0.0291
98	72	20	0.1342	0.1342	0.1424	-0.0312	0.1535	-0.0361	0.1541	-0.0296	-0.0323
131	72	20	0.1342	0.1342	0.1423	-0.0320	0.1534	-0.0373	0.1539	-0.0318	-0.0337
159	72	20	0.1343	0.1341	0.1421	-0.0339	0.1532	-0.0393	0.1536	-0.0348	-0.0360
194	72	20	0.1340	0.1340	0.1420	-0.0330	0.1531	-0.0383	0.1536	-0.0328	-0.0347
222	73	20	0.1340	0.1340	0.1419	-0.0340	0.1531	-0.0383	0.1535	-0.0338	-0.0354
251	73	20	0.1342	0.1342	0.1420	-0.0350	0.1532	-0.0393	0.1536	-0.0348	-0.0364
287	72	22	0.1343	0.1343	0.1420	-0.0360	0.1532	-0.0403	0.1536	-0.0358	-0.0374
310	73	20	0.1336	0.1336	0.1413	-0.0359	0.1523	-0.0423	0.1529	-0.0357	-0.0380
344	72	22	0.1347	0.1345	0.1423	-0.0359	0.1535	-0.0403	0.1540	-0.0348	-0.0370
372	72	25	0.1344	0.1344	0.1423	-0.0339	0.1535	-0.0383	0.1539	-0.0337	-0.0353
400	73	20	0.1346	0.1345	0.1420	-0.0385	0.1530	-0.0448	0.1535	-0.0393	-0.0409
432	73	21	0.1346	0.1346	0.1423	-0.0359	0.1535	-0.0403	0.1541	-0.0338	-0.0367
461	72	24	0.1336	0.1335	0.1412	-0.0365	0.1522	-0.0428	0.1527	-0.0373	-0.0389
488	72	30	0.1342	0.1342	0.1422	-0.0330	0.1534	-0.0373	0.1538	-0.0328	-0.0344
522	72	36	0.1337	0.1337	0.1420	-0.0305	0.1531	-0.0358	0.1536	-0.0303	-0.0322
560	72	33	0.1337	0.1337	0.1418	-0.0320	0.1529	-0.0373	0.1535	-0.0308	-0.0334

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: AMSTONE - METEROMIX 240
 Batch Id.: Material No. 2

Mixture Data: Dry Repair Material: 36,320.0 (g)
 Aggregate: 0.0 (g)
 Water: 3,311.9 (g)
 W/M: 0.091
 No aggregate added.

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	95	0.1250	0.1252	0.1249	---	0.1316	---	0.1305	---
9	73	95	0.1257	0.1257	0.1250	-0.0051	0.1316	-0.0057	0.1304	-0.0077
23	73	95	0.1248	0.1248	0.1224	-0.0220	0.1291	-0.0221	0.1277	-0.0250
30	73	95	0.1258	0.1265	0.1226	-0.0336	0.1294	-0.0321	0.1281	-0.0354
45	73	95	0.1261	0.1261	0.1219	-0.0402	0.1287	-0.0395	0.1273	-0.0425
52	73	95	0.1265	0.1264	0.1221	-0.0418	0.1287	-0.0426	0.1274	-0.0448
59	73	95	0.1260	0.1260	0.1216	-0.0423	0.1283	-0.0420	0.1269	-0.0457
77	73	95	0.1258	0.1258	0.1212	-0.0446	0.1277	-0.0465	0.1263	-0.0492
87	73	95	0.1257	0.1257	0.1213	-0.0420	0.1277	-0.0446	0.1264	-0.0470
96	73	95	0.1263	0.1263	0.1208	-0.0525	0.1276	-0.0519	0.1262	-0.0553
126	73	100	0.1256	0.1256	0.1215	-0.0389	0.1283	-0.0377	0.1268	-0.0421
159	72	100	0.1342	0.1342	0.1312	-0.0280	0.1381	-0.0264	0.1368	-0.0288
192	72	100	0.1342	0.1342	0.1314	-0.0260	0.1382	-0.0248	0.1369	-0.0272
220	72	100	0.1341	0.1340	0.1314	-0.0245	0.1381	-0.0243	0.1369	-0.0257
255	72	95	0.1340	0.1340	0.1313	-0.0250	0.1381	-0.0238	0.1369	-0.0252
283	72	96	0.1340	0.1340	0.1313	-0.0250	0.1381	-0.0238	0.1371	-0.0232
312	72	95	0.1342	0.1341	0.1313	-0.0265	0.1382	-0.0243	0.1369	-0.0267
348	72	90	0.1343	0.1343	0.1315	-0.0260	0.1382	-0.0258	0.1369	-0.0282
371	74	95	0.1336	0.1336	0.1308	-0.0260	0.1376	-0.0248	0.1363	-0.0272
405	67	93	0.1347	0.1346	0.1314	-0.0305	0.1382	-0.0293	0.1370	-0.0307
433	72	95	0.1344	0.1343	0.1311	-0.0305	0.1378	-0.0303	0.1365	-0.0327
461	70	90	0.1346	0.1345	0.1310	-0.0335	0.1378	-0.0323	0.1365	-0.0347
493	70	89	0.1346	0.1346	0.1309	-0.0350	0.1377	-0.0338	0.1365	-0.0352
522	72	86	0.1336	0.1335	0.1303	-0.0305	0.1372	-0.0283	0.1359	-0.0307
549	70	92	0.1342	0.1342	0.1307	-0.0330	0.1375	-0.0318	0.1362	-0.0342
583	72	86	0.1337	0.1338	0.1299	-0.0365	0.1368	-0.0343	0.1354	-0.0377
621	72	80	0.1337	0.1337	0.1365	0.0300	0.1353	-0.0488	0.1297	-0.0942

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: AMSTONE - METEROMIX 240
Batch Id.: Material No. 2

Mixture Data: Dry Repair Material: 36,320.0 (g)
Aggregate: 0.0 (g) No aggregate added.
Water: 3,311.9 (g)
W/M: 0.091

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data						Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Bar Reading		Specimen 1		Specimen 2		Specimen 3		
			Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	78	43	0.1250	0.1252	0.1258	---	0.1307	---	0.1238	---	---
9	73	50	0.1257	0.1257	0.1259	-0.0054	0.1306	-0.0077	0.1238	-0.0064	-0.0065
23	80	43	0.1248	0.1248	0.1226	-0.0300	0.1272	-0.0324	0.1206	-0.0302	-0.0309
30	73	48	0.1258	0.1261	0.1281	0.0133	0.1222	-0.0940	0.1201	-0.0465	-0.0424
45	70	46	0.1261	0.1261	0.1214	-0.0546	0.1259	-0.0584	0.1193	-0.0556	-0.0562
52	70	44	0.1265	0.1264	0.1213	-0.0588	0.1257	-0.0644	0.1191	-0.0611	-0.0614
59	71	50	0.1260	0.1260	0.1207	-0.0612	0.1251	-0.0657	0.1185	-0.0629	-0.0633
77	72	55	0.1258	0.1258	0.1198	-0.0677	0.1243	-0.0720	0.1176	-0.0700	-0.0699
87	73	48	0.1257	0.1257	0.1193	-0.0710	0.1237	-0.0760	0.1172	-0.0729	-0.0733
96	70	37	0.1263	0.1263	0.1194	-0.0761	0.1238	-0.0815	0.1172	-0.0784	-0.0787
126	74	45	0.1256	0.1256	0.1185	-0.0781	0.1229	-0.0831	0.1163	-0.0801	-0.0804
159	72	50	0.1342	0.1342	0.1266	-0.0835	0.1312	-0.0869	0.1244	-0.0854	-0.0853
192	72	50	0.1342	0.1342	0.1265	-0.0844	0.1307	-0.0916	0.1242	-0.0876	-0.0879
220	72	50	0.1341	0.1340	0.1259	-0.0889	0.1304	-0.0931	0.1237	-0.0911	-0.0910
255	70	52	0.1340	0.1340	0.1258	-0.0894	0.1302	-0.0946	0.1236	-0.0916	-0.0919
283	68	54	0.1340	0.1340	0.1256	-0.0914	0.1301	-0.0956	0.1235	-0.0926	-0.0932
312	68	55	0.1342	0.1341	0.1259	-0.0899	0.1303	-0.0951	0.1237	-0.0921	-0.0924
348	68	55	0.1343	0.1343	0.1256	-0.0944	0.1301	-0.0986	0.1235	-0.0956	-0.0962
371	68	51	0.1336	0.1336	0.1251	-0.0924	0.1295	-0.0976	0.1231	-0.0926	-0.0942
405	66	41	0.1347	0.1346	0.1255	-0.0989	0.1300	-0.1031	0.1233	-0.1011	-0.1010
433	69	47	0.1344	0.1343	0.1254	-0.0969	0.1299	-0.1011	0.1233	-0.0981	-0.0987
461	68	42	0.1346	0.1345	0.1253	-0.0999	0.1297	-0.1051	0.1231	-0.1021	-0.1024
493	69	25	0.1346	0.1346	0.1253	-0.1004	0.1296	-0.1066	0.1231	-0.1026	-0.1032
522	67	40	0.1336	0.1335	0.1245	-0.0979	0.1290	-0.1021	0.1224	-0.0991	-0.0997
549	65	49	0.1342	0.1342	0.1250	-0.0994	0.1294	-0.1046	0.1228	-0.1016	-0.1019
583	71	60	0.1337	0.1338	0.1248	-0.0969	0.1292	-0.1021	0.1226	-0.0991	-0.0994
621	70	53	0.1337	0.1337	0.1250	-0.0944	0.1295	-0.0986	0.1229	-0.0956	-0.0962

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: AMSTONE - METEROMIX 240
Batch id.: Material No. 2

Mixture Data: Dry Repair Material: 36,320.0 (g)
Aggregate: 0.0 (g) No aggregate added.
Water: 3,311.9 (g)
W/M: 0.091

Specimen Age (days)	Storage Conditions			Reference Bar Reading		Dry Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Length Change (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Specimen 3	
						Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	20	---	0.1250	0.1252	0.1348	---	0.1354	---	0.1316	---
9	73	20	---	0.1257	0.1257	0.1345	-0.0093	0.1353	-0.0070	0.1315	-0.0074
23	78	20	---	0.1248	0.1248	0.1303	-0.0425	0.1311	-0.0404	0.1273	-0.0410
30	73	20	---	0.1258	0.1261	0.1307	-0.0506	0.1315	-0.0481	0.1276	-0.0489
45	73	20	---	0.1261	0.1261	0.1296	-0.0628	0.1305	-0.0595	0.1264	-0.0622
52	73	20	---	0.1265	0.1264	0.1300	-0.0618	0.1307	-0.0604	0.1268	-0.0619
59	73	20	---	0.1260	0.1260	0.1288	-0.0697	0.1296	-0.0671	0.1256	-0.0693
77	73	20	---	0.1258	0.1258	0.1278	-0.0776	0.1286	-0.0752	0.1247	-0.0768
87	73	20	---	0.1257	0.1257	0.1274	-0.0802	0.1283	-0.0768	0.1244	-0.0785
96	73	20	---	0.1263	0.1263	0.1275	-0.0853	0.1284	-0.0819	0.1244	-0.0841
126	73	20	---	0.1256	0.1256	0.1264	-0.0892	0.1273	-0.0861	0.1233	-0.0883
159	72	20	---	0.1342	0.1342	0.1347	-0.0922	0.1357	-0.0888	0.1316	-0.0916
192	72	20	---	0.1342	0.1342	0.1344	-0.0954	0.1353	-0.0922	0.1313	-0.0944
220	72	20	---	0.1341	0.1340	0.1339	-0.0989	0.1348	-0.0957	0.1308	-0.0979
255	72	20	---	0.1340	0.1340	0.1336	-0.1014	0.1345	-0.0982	0.1306	-0.0994
283	72	20	---	0.1340	0.1340	0.1335	-0.1024	0.1345	-0.0982	0.1306	-0.0994
312	72	20	---	0.1342	0.1341	0.1335	-0.1039	0.1342	-0.1027	0.1306	-0.1009
348	72	22	---	0.1343	0.1343	0.1335	-0.1054	0.1345	-0.1012	0.1305	-0.1033
371	73	20	---	0.1336	0.1336	0.1325	-0.1084	0.1335	-0.1042	0.1296	-0.1054
405	72	22	---	0.1347	0.1346	0.1335	-0.1089	0.1346	-0.1037	0.1307	-0.1049
433	72	25	---	0.1344	0.1343	0.1335	-0.1059	0.1346	-0.1007	0.1306	-0.1029
461	73	20	---	0.1346	0.1345	0.1333	-0.1099	0.1343	-0.1057	0.1304	-0.1069
493	73	21	---	0.1346	0.1346	0.1336	-0.1074	0.1345	-0.1042	0.1306	-0.1054
522	72	24	---	0.1336	0.1335	0.1325	-0.1079	0.1335	-0.1037	0.1296	-0.1049
549	72	30	---	0.1342	0.1342	0.1333	-0.1064	0.1343	-0.1022	0.1304	-0.1034
583	72	36	---	0.1337	0.1338	0.1330	-0.1049	0.1340	-0.1007	0.1302	-0.1009
621	72	33	---	0.1337	0.1337	0.1328	-0.1064	0.1338	-0.1022	0.1300	-0.1024

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 1" Prismatic Specimens)

Product being tested:

CONPROCO - ONE SHOT

Batch id.: Material No. 3

Mixture Data: Dry Repair Material:

72,640.0 (g)

Aggregate:

0.0 (g)

Water:

6,623.8 (g)

W/M:

0.091

No aggregate added.

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
7	73	95	0.1270	0.1272	0.1368	---	0.1338	---	0.1503	---
10	73	95	0.1264	0.1265	0.1354	-0.0056	0.1324	-0.0079	0.1483	-0.0135
17	73	95	0.1260	0.1272	0.1342	-0.0190	0.1313	-0.0202	0.1470	-0.0281
36	73	95	0.1260	0.1258	0.1327	-0.0273	0.1296	-0.0307	0.1455	-0.0365
45	73	95	0.1257	0.1267	0.1320	-0.0376	0.1288	-0.0414	0.1445	-0.0490
64	73	95	0.1263	0.1262	0.1309	-0.0487	0.1276	-0.0537	0.1435	-0.0598
94	73	100	0.1256	0.1257	0.1312	-0.0394	0.1278	-0.0453	0.1436	-0.0524
127	72	100	0.1342	0.1342	0.1409	-0.0285	0.1378	-0.0311	0.1536	-0.0386
160	72	100	0.1342	0.1342	0.1409	-0.0282	0.1377	-0.0322	0.1536	-0.0383
188	72	100	0.1340	0.1340	0.1407	-0.0282	0.1375	-0.0321	0.1534	-0.0382
233	72	95	0.1340	0.1340	0.1406	-0.0292	0.1373	-0.0342	0.1533	-0.0393
261	73	96	0.1340	0.1340	0.1405	-0.0302	0.1372	-0.0352	0.1531	-0.0412
290	72	95	0.1341	0.1341	0.1405	-0.0312	0.1372	-0.0362	0.1530	-0.0432
326	72	90	0.1343	0.1343	0.1405	-0.0332	0.1372	-0.0382	0.1531	-0.0442
349	74	95	0.1336	0.1336	0.1399	-0.0322	0.1366	-0.0371	0.1525	-0.0432
383	67	93	0.1347	0.1346	0.1405	-0.0367	0.1372	-0.0417	0.1531	-0.0477
411	72	95	0.1343	0.1343	0.1400	-0.0382	0.1365	-0.0451	0.1524	-0.0512
439	70	90	0.1346	0.1345	0.1401	-0.0397	0.1367	-0.0457	0.1525	-0.0528
471	70	89	0.1346	0.1346	0.1401	-0.0402	0.1366	-0.0471	0.1525	-0.0532
527	70	92	0.1342	0.1342	0.1395	-0.0422	0.1362	-0.0472	0.1512	-0.0623
561	72	86	0.1337	0.1338	0.1390	-0.0427	0.1355	-0.0496	0.1515	-0.0548
599	72	80	0.1337	0.1337	0.1387	-0.0453	0.1353	-0.0512	0.1512	-0.0573
										-0.0512

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: CONPROCO - ONE SHOT
Batch id.: Material No. 3

Mixture Data: Dry Repair Material: 72.640.0 (g)
Aggregate: 0.0 (g)
Water: 6.623.8 (g)
W/M: 0.091
No aggregate added.

Specimen Age (days)	Storage Conditions			Reference Bar Reading		Room Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Specimen 3		Average Length Change (%)
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
7	73	50	0.1270	0.1272	0.1487	---	0.1515	---	0.1687	---	---
10	70	44	0.1264	0.1265	0.1470	-0.0106	0.1497	-0.0111	0.1670	-0.0101	-0.0106
17	71	50	0.1260	0.1272	0.1451	-0.0312	0.1476	-0.0338	0.1650	-0.0320	-0.0324
36	72	55	0.1260	0.1258	0.1418	-0.0572	0.1443	-0.0604	0.1615	-0.0598	-0.0592
45	73	48	0.1257	0.1267	0.1409	-0.0695	0.1431	-0.0750	0.1605	-0.0732	-0.0726
64	70	37	0.1263	0.1262	0.1402	-0.0763	0.1423	-0.0833	0.1597	-0.0812	-0.0803
94	74	45	0.1256	0.1257	0.1389	-0.0834	0.1409	-0.0909	0.1583	-0.0890	-0.0878
127	72	50	0.1342	0.1342	0.1465	-0.0933	0.1487	-0.0992	0.1664	-0.0939	-0.0955
160	72	50	0.1342	0.1342	0.1463	-0.0952	0.1483	-0.1029	0.1661	-0.0969	-0.0983
188	70	45	0.1340	0.1340	0.1458	-0.0982	0.1478	-0.1059	0.1657	-0.0989	-0.1010
233	70	52	0.1340	0.1340	0.1457	-0.0992	0.1477	-0.1069	0.1656	-0.0998	-0.1020
261	68	54	0.1340	0.1340	0.1457	-0.0992	0.1477	-0.1069	0.1654	-0.1019	-0.1026
290	68	55	0.1341	0.1341	0.1459	-0.0982	0.1479	-0.1058	0.1657	-0.0998	-0.1013
326	68	55	0.1343	0.1343	0.1457	-0.1022	0.1476	-0.1108	0.1655	-0.1038	-0.1056
349	68	51	0.1336	0.1336	0.1452	-0.1002	0.1471	-0.1088	0.1650	-0.1018	-0.1036
383	66	41	0.1347	0.1346	0.1458	-0.1047	0.1477	-0.1133	0.1655	-0.1073	-0.1085
411	69	47	0.1343	0.1343	0.1456	-0.1032	0.1475	-0.1119	0.1654	-0.1048	-0.1066
439	68	42	0.1346	0.1345	0.1455	-0.1067	0.1474	-0.1153	0.1653	-0.1083	-0.1101
471	69	25	0.1346	0.1346	0.1454	-0.1082	0.1473	-0.1169	0.1652	-0.1098	-0.1116
527	65	49	0.1342	0.1342	0.1452	-0.1062	0.1472	-0.1139	0.1651	-0.1069	-0.1090
561	71	60	0.1337	0.1338	0.1451	-0.1027	0.1470	-0.1114	0.1649	-0.1044	-0.1061
599	70	53	0.1337	0.1337	0.1452	-0.1012	0.1471	-0.1098	0.1650	-0.1028	-0.1046

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested:

CONPROCO - ONE SHOT

Batch Id.: Material No. 3

Mixture Data: Dry Repair Material:

72,640.0 (g)

Aggregate:

0.0 (g)

Water:

6,623.8 (g)

W/M:

0.091

No aggregate added.

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data							
					Specimen 1		Specimen 2		Specimen 3		Average Length Change (%)	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)		
7	73	20	0.1270	0.1272	0.1422	---	0.1594	---	0.1671	---	---	---
10	73	20	0.1264	0.1265	0.1407	-0.0082	0.1579	-0.0084	0.1656	-0.0083	-0.0083	-0.0083
17	73	20	0.1260	0.1272	0.1382	-0.0350	0.1554	-0.0345	0.1632	-0.0344	-0.0347	-0.0347
36	73	20	0.1260	0.1258	0.1346	-0.0639	0.1518	-0.0641	0.1596	-0.0636	-0.0639	-0.0639
45	73	20	0.1257	0.1267	0.1335	-0.0780	0.1506	-0.0789	0.1584	-0.0786	-0.0785	-0.0785
64	73	20	0.1263	0.1262	0.1336	-0.0769	0.1499	-0.0861	0.1575	-0.0871	-0.0834	-0.0834
94	73	20	0.1256	0.1257	0.1314	-0.0929	0.1484	-0.0947	0.1562	-0.0942	-0.0939	-0.0939
127	72	20	0.1342	0.1342	0.1395	-0.0980	0.1567	-0.0981	0.1654	-0.0981	-0.0947	-0.0947
160	72	20	0.1342	0.1342	0.1392	-0.1009	0.1563	-0.1019	0.1642	-0.1000	-0.1009	-0.1009
188	72	20	0.1340	0.1340	0.1387	-0.1039	0.1559	-0.1038	0.1638	-0.1020	-0.1032	-0.1032
233	72	20	0.1340	0.1340	0.1385	-0.1058	0.1557	-0.1058	0.1635	-0.1050	-0.1056	-0.1056
261	73	20	0.1340	0.1340	0.1385	-0.1058	0.1556	-0.1069	0.1635	-0.1050	-0.1059	-0.1059
290	72	20	0.1341	0.1341	0.1385	-0.1068	0.1557	-0.1068	0.1636	-0.1050	-0.1062	-0.1062
326	72	22	0.1343	0.1343	0.1385	-0.1088	0.1557	-0.1088	0.1635	-0.1080	-0.1086	-0.1086
349	73	20	0.1336	0.1336	0.1376	-0.1108	0.1548	-0.1108	0.1626	-0.1100	-0.1106	-0.1106
383	72	22	0.1347	0.1346	0.1387	-0.1103	0.1559	-0.1103	0.1636	-0.1105	-0.1104	-0.1104
411	72	25	0.1343	0.1343	0.1386	-0.1078	0.1558	-0.1078	0.1636	-0.1070	-0.1076	-0.1076
439	73	20	0.1346	0.1345	0.1383	-0.1133	0.1556	-0.1123	0.1634	-0.1115	-0.1124	-0.1124
471	73	21	0.1346	0.1346	0.1386	-0.1108	0.1558	-0.1108	0.1635	-0.1110	-0.1109	-0.1109
527	72	30	0.1342	0.1342	0.1384	-0.1089	0.1556	-0.1089	0.1635	-0.1070	-0.1083	-0.1083
561	72	36	0.1337	0.1338	0.1381	-0.1073	0.1554	-0.1063	0.1631	-0.1066	-0.1067	-0.1067
599	72	33	0.1337	0.1337	0.1380	-0.1078	0.1553	-0.1069	0.1630	-0.1070	-0.1072	-0.1072

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: STRUCTURAL CONCRETE - FIVE STAR

Batch Id.: Material No. 4

Mixture Data: Dry Repair Material: 22,700.0 (g)
Aggregate: 11,350.0 (g)
Water: 6,151.1 (g)
W/M: 0.271

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	95	0.1259	0.1259	0.1486	---	0.1551	---	0.1201	---
7	73	95	0.1258	0.1259	0.1485	-0.0012	0.1549	-0.0020	0.1201	0.0004
16	73	95	0.1258	0.1258	0.1476	-0.0095	0.1540	-0.0108	0.1192	-0.0081
25	73	95	0.1256	0.1258	0.1469	-0.0152	0.1533	-0.0169	0.1185	-0.0154
44	73	95	0.1263	0.1262	0.1467	-0.0227	0.1529	-0.0259	0.1182	-0.0224
74	73	100	0.1257	0.1256	0.1467	-0.0163	0.1530	-0.0187	0.1183	-0.0156
107	72	100	0.1342	0.1342	0.1561	-0.0091	0.1626	-0.0088	0.1275	-0.0090
140	72	100	0.1342	0.1342	0.1561	-0.0084	0.1626	-0.0084	0.1275	-0.0091
168	70	100	0.1340	0.1340	0.1559	-0.0084	0.1623	-0.0094	0.1274	-0.0081
203	70	95	0.1339	0.1339	0.1559	-0.0073	0.1624	-0.0074	0.1274	-0.0070
231	72	96	0.1340	0.1339	0.1558	-0.0089	0.1622	-0.0099	0.1272	-0.0096
260	72	95	0.1341	0.1341	0.1558	-0.0104	0.1622	-0.0113	0.1274	-0.0090
296	72	90	0.1343	0.1343	0.1559	-0.0113	0.1622	-0.0134	0.1272	-0.0131
319	74	95	0.1336	0.1336	0.1552	-0.0113	0.1618	-0.0104	0.1266	-0.0121
353	67	93	0.1347	0.1345	0.1555	-0.0184	0.1620	-0.0184	0.1270	-0.0181
381	72	95	0.1343	0.1343	0.1554	-0.0163	0.1618	-0.0174	0.1269	-0.0160
409	70	90	0.1345	0.1345	0.1554	-0.0184	0.1617	-0.0204	0.1269	-0.0181
441	70	89	0.1346	0.1346	0.1551	-0.0224	0.1616	-0.0224	0.1267	-0.0210
470	72	86	0.1336	0.1335	0.1545	-0.0179	0.1611	-0.0169	0.1262	-0.0156
497	70	92	0.1342	0.1342	0.1550	-0.0194	0.1614	-0.0204	0.1266	-0.0181
531	72	86	0.1337	0.1338	0.1545	-0.0199	0.1610	-0.0199	0.1261	-0.0186
569	72	80	0.1337	0.1337	0.1544	-0.0204	0.1609	-0.0204	0.1260	-0.0191
										-0.0199

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: STRUCTURAL CONCRETE - FIVE STAR

Batch Id.: Material No. 4

Mixture Data: Dry Repair Material: 22,700.0 (g)
 Aggregate: 11,350.0 (g)
 Water: 6,151.1 (g)
 W/M: 0.271

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data						Average Length Change (%)
					Specimen 1		Specimen 2		Specimen 3		
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	72	45	0.1259	0.1259	0.1542	---	0.1703	---	0.1355	---	---
7	73	45	0.1258	0.1259	0.1541	-0.0014	0.1703	-0.0009	0.1353	-0.0019	-0.0014
16	73	50	0.1258	0.1258	0.1529	-0.0129	0.1689	-0.0142	0.1343	-0.0116	-0.0129
25	73	48	0.1256	0.1258	0.1523	-0.0181	0.1682	-0.0197	0.1336	-0.0180	-0.0186
44	70	37	0.1263	0.1262	0.1518	-0.0285	0.1678	-0.0294	0.1333	-0.0260	-0.0280
74	74	45	0.1257	0.1256	0.1506	-0.0346	0.1665	-0.0360	0.1319	-0.0336	-0.0348
107	72	50	0.1342	0.1342	0.1585	-0.0412	0.1743	-0.0440	0.1395	-0.0438	-0.0430
140	72	50	0.1342	0.1342	0.1579	-0.0468	0.1737	-0.0497	0.1390	-0.0485	-0.0483
168	70	45	0.1340	0.1339	0.1573	-0.0504	0.1731	-0.0532	0.1383	-0.0530	-0.0522
203	70	52	0.1339	0.1339	0.1570	-0.0528	0.1729	-0.0546	0.1381	-0.0545	-0.0540
231	68	54	0.1340	0.1339	0.1569	-0.0543	0.1727	-0.0572	0.1378	-0.0580	-0.0565
260	68	55	0.1341	0.1341	0.1568	-0.0568	0.1722	-0.0637	0.1374	-0.0635	-0.0613
296	68	55	0.1343	0.1343	0.1570	-0.0568	0.1729	-0.0587	0.1379	-0.0605	-0.0587
319	68	51	0.1336	0.1336	0.1562	-0.0578	0.1722	-0.0587	0.1373	-0.0595	-0.0587
353	66	41	0.1347	0.1345	0.1563	-0.0668	0.1722	-0.0687	0.1374	-0.0685	-0.0680
381	69	47	0.1343	0.1343	0.1565	-0.0618	0.1724	-0.0637	0.1375	-0.0645	-0.0633
409	68	42	0.1345	0.1345	0.1564	-0.0648	0.1723	-0.0667	0.1374	-0.0675	-0.0663
441	69	25	0.1346	0.1346	0.1561	-0.0689	0.1720	-0.0707	0.1371	-0.0715	-0.0703
470	67	40	0.1336	0.1335	0.1554	-0.0653	0.1713	-0.0672	0.1364	-0.0680	-0.0668
497	65	49	0.1342	0.1342	0.1558	-0.0679	0.1718	-0.0687	0.1368	-0.0705	-0.0690
531	71	60	0.1337	0.1338	0.1556	-0.0654	0.1715	-0.0672	0.1366	-0.0680	-0.0668
569	70	53	0.1337	0.1337	0.1559	-0.0618	0.1718	-0.0637	0.1369	-0.0645	-0.0633

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: **STRUCTURAL CONCRETE - FIVE STAR**

Batch id.: Material No. 4

Mixture Data: Dry Repair Material: 22,700.0 (g)
 Aggregate: 11,350.0 (g)
 Water: 6,151.1 (g)
 W/M: 0.271

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data								Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Specimen 3				
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)			
1	73	20	0.1259	0.1259	0.1255	---	0.1263	---	0.1721	---	---		
7	73	20	0.1258	0.1259	0.1255	-0.0004	0.1265	0.0021	0.1719	-0.0016	0.0000		
16	73	20	0.1258	0.1258	0.1244	-0.0107	0.1253	-0.0098	0.1708	-0.0123	-0.0109		
25	73	20	0.1256	0.1258	0.1235	-0.0186	0.1245	-0.0160	0.1699	-0.0201	-0.0182		
44	73	20	0.1263	0.1262	0.1232	-0.0272	0.1241	-0.0257	0.1696	-0.0290	-0.0273		
74	73	20	0.1257	0.1256	0.1217	-0.0360	0.1226	-0.0348	0.1681	-0.0375	-0.0361		
107	72	20	0.1342	0.1342	0.1296	-0.0428	0.1305	-0.0419	0.1761	-0.0438	-0.0428		
140	72	20	0.1342	0.1342	0.1290	-0.0487	0.1298	-0.0481	0.1754	-0.0501	-0.0489		
168	72	20	0.1340	0.1340	0.1283	-0.0537	0.1292	-0.0521	0.1746	-0.0560	-0.0539		
203	72	20	0.1339	0.1339	0.1279	-0.0566	0.1288	-0.0551	0.1743	-0.0580	-0.0566		
231	73	20	0.1340	0.1339	0.1277	-0.0592	0.1285	-0.0586	0.1742	-0.0596	-0.0591		
260	72	20	0.1341	0.1341	0.1278	-0.0596	0.1285	-0.0601	0.1741	-0.0620	-0.0606		
296	72	20	0.1343	0.1343	0.1274	-0.0656	0.1282	-0.0651	0.1737	-0.0681	-0.0663		
319	73	20	0.1336	0.1336	0.1266	-0.0667	0.1274	-0.0661	0.1730	-0.0681	-0.0669		
353	72	22	0.1347	0.1345	0.1276	-0.0667	0.1284	-0.0661	0.1740	-0.0681	-0.0669		
381	72	25	0.1343	0.1343	0.1276	-0.0637	0.1283	-0.0641	0.1742	-0.0631	-0.0636		
409	73	20	0.1345	0.1345	0.1273	-0.0687	0.1280	-0.0691	0.1738	-0.0690	-0.0689		
441	73	21	0.1346	0.1346	0.1274	-0.0686	0.1282	-0.0681	0.1739	-0.0690	-0.0686		
470	72	24	0.1336	0.1335	0.1265	-0.0672	0.1272	-0.0676	0.1728	-0.0695	-0.0681		
497	72	30	0.1342	0.1342	0.1272	-0.0667	0.1280	-0.0661	0.1736	-0.0681	-0.0669		
531	72	36	0.1337	0.1338	0.1270	-0.0642	0.1277	-0.0646	0.1733	-0.0665	-0.0651		
569	72	33	0.1337	0.1337	0.1270	-0.0637	0.1275	-0.0661	0.1730	-0.0691	-0.0663		

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: W. GRACE - FASSTRAK PATCH
Batch Id.: Material No. 5

Mixture Data: Dry Repair Material: 22,700.0 (g)
Aggregate: 13,620.0 (g)
Water: 5,047.0 (g)
W/M: 0.222

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	95	0.1246	0.1246	0.1408	---	0.1517	---	0.1245	---
10	73	95	0.1260	0.1260	0.1423	0.0007	0.1534	0.0031	0.1262	0.0032
20	73	95	0.1247	0.1247	0.1393	-0.0159	0.1503	-0.0149	0.1232	-0.0139
27	73	95	0.1257	0.1256	0.1399	-0.0192	0.1507	-0.0203	0.1235	-0.0206
42	73	95	0.1261	0.1261	0.1398	-0.0252	0.1507	-0.0252	0.1237	-0.0224
49	73	95	0.1264	0.1264	0.1398	-0.0288	0.1509	-0.0266	0.1239	-0.0242
56	73	95	0.1273	0.1272	0.1395	-0.0395	0.1506	-0.0377	0.1235	-0.0357
75	73	95	0.1258	0.1261	0.1391	-0.0308	0.1502	-0.0290	0.1230	-0.0286
84	73	95	0.1258	0.1257	0.1391	-0.0286	0.1501	-0.0271	0.1229	-0.0270
103	73	93	0.1262	0.1262	0.1390	-0.0345	0.1500	-0.0331	0.1230	-0.0315
133	73	100	0.1256	0.1255	0.1394	-0.0238	0.1504	-0.0226	0.1233	-0.0213
166	72	100	0.1342	0.1342	0.1484	-0.0203	0.1598	-0.0153	0.1326	-0.0151
199	72	100	0.1342	0.1342	0.1484	-0.0202	0.1598	-0.0150	0.1326	-0.0148
227	72	100	0.1339	0.1339	0.1483	-0.0182	0.1598	-0.0120	0.1325	-0.0128
262	72	95	0.1338	0.1338	0.1482	-0.0182	0.1597	-0.0120	0.1325	-0.0118
290	72	96	0.1339	0.1339	0.1482	-0.0192	0.1597	-0.0130	0.1324	-0.0138
319	72	95	0.1341	0.1341	0.1483	-0.0202	0.1598	-0.0140	0.1325	-0.0148
355	72	90	0.1343	0.1342	0.1484	-0.0207	0.1599	-0.0145	0.1326	-0.0153
378	74	95	0.1336	0.1336	0.1478	-0.0202	0.1594	-0.0130	0.1322	-0.0128
412	67	93	0.1347	0.1345	0.1483	-0.0252	0.1598	-0.0190	0.1325	-0.0198
440	72	95	0.1343	0.1343	0.1481	-0.0242	0.1596	-0.0180	0.1324	-0.0178
468	70	90	0.1345	0.1345	0.1481	-0.0262	0.1596	-0.0200	0.1324	-0.0198
500	70	89	0.1346	0.1346	0.1480	-0.0282	0.1595	-0.0220	0.1323	-0.0218
529	72	86	0.1336	0.1335	0.1476	-0.0217	0.1592	-0.0145	0.1319	-0.0153
556	70	92	0.1342	0.1342	0.1481	-0.0232	0.1596	-0.0170	0.1323	-0.0178
590	72	86	0.1337	0.1338	0.1475	-0.0247	0.1591	-0.0175	0.1319	-0.0173
628	72	80	0.1337	0.1337	0.1474	-0.0252	0.1589	-0.0190	0.1317	-0.0188
										-0.0210

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: W. GRACE - FASTRAK PATCH
Batch Id.: Material No. 5

Mixture Data: Dry Repair Material: 22,700.0 (g)
Aggregate: 13,620.0 (g)
Water: 5,047.0 (g)
W/M: 0.222

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data				Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Initial (Inches)	Final (Inches)	Specimen 1 Reading (Inches)	Specimen 1 Length Change (%)	Specimen 2 Reading (Inches)	Specimen 2 Length Change (%)	
1	80	50	0.1246	0.1246	0.1403	---	0.1446	---	---
10	71	46	0.1260	0.1260	0.1417	-0.0003	0.1462	0.0019	0.0008
20	81	42	0.1247	0.1247	0.1388	-0.0155	0.1432	-0.0145	-0.0152
27	71	46	0.1257	0.1256	0.1387	-0.0260	0.1433	-0.0235	-0.0254
42	70	46	0.1261	0.1261	0.1386	-0.0314	0.1430	-0.0305	-0.0310
49	70	44	0.1264	0.1264	0.1387	-0.0338	0.1430	-0.0336	-0.0335
56	71	50	0.1263	0.1262	0.1386	-0.0333	0.1429	-0.0333	-0.0334
75	73	50	0.1258	0.1261	0.1379	-0.0379	0.1422	-0.0370	-0.0344
84	73	48	0.1258	0.1257	0.1379	-0.0354	0.1422	-0.0347	-0.0353
103	70	37	0.1262	0.1262	0.1382	-0.0372	0.1424	-0.0380	-0.0377
133	74	45	0.1256	0.1255	0.1375	-0.0375	0.1417	-0.0381	-0.0379
166	72	50	0.1342	0.1342	0.1457	-0.0422	0.1499	-0.0429	-0.0423
199	72	50	0.1342	0.1342	0.1454	-0.0448	0.1495	-0.0466	-0.0446
227	70	45	0.1339	0.1339	0.1450	-0.0458	0.1491	-0.0476	-0.0463
262	70	52	0.1338	0.1338	0.1450	-0.0448	0.1491	-0.0466	-0.0450
290	68	54	0.1339	0.1339	0.1446	-0.0498	0.1488	-0.0506	-0.0493
319	68	55	0.1341	0.1341	0.1450	-0.0478	0.1492	-0.0486	-0.0480
355	68	55	0.1343	0.1342	0.1448	-0.0513	0.1490	-0.0521	-0.0508
378	68	51	0.1336	0.1336	0.1442	-0.0508	0.1483	-0.0526	-0.0507
412	66	41	0.1347	0.1345	0.1445	-0.0578	0.1486	-0.0596	-0.0577
440	69	47	0.1343	0.1343	0.1443	-0.0568	0.1484	-0.0586	-0.0567
468	68	42	0.1345	0.1345	0.1439	-0.0628	0.1480	-0.0646	-0.0627
500	69	25	0.1346	0.1346	0.1434	-0.0688	0.1474	-0.0716	-0.0690
529	67	40	0.1336	0.1335	0.1428	-0.0643	0.1469	-0.0661	-0.0638
556	65	49	0.1342	0.1342	0.1432	-0.0668	0.1473	-0.0686	-0.0660
590	71	60	0.1337	0.1338	0.1434	-0.0603	0.1475	-0.0621	-0.0595
628	70	53	0.1337	0.1337	0.1436	-0.0578	0.1478	-0.0586	-0.0567

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: EUCLID SR - 93
 Batch id.: Material No. 6

Mixture Data: Dry Repair Material: 45,400.0 (g)
 Aggregate: 0.0 (g) No aggregate added.
 Water: 4,400.0 (g)
 W/M: 0.097

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Specimen 3	
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	95	0.1262	0.1262	0.1245	---	0.1413	---	0.1289	---
8	73	95	0.1246	0.1246	0.1230	0.0015	0.1397	0.0001	0.1273	0.0003
28	73	95	0.1247	0.1248	0.1204	-0.0264	0.1371	-0.0274	0.1248	-0.0262
35	73	95	0.1256	0.1257	0.1206	-0.0338	0.1376	-0.0316	0.1250	-0.0329
50	73	95	0.1261	0.1262	0.1205	-0.0395	0.1372	-0.0401	0.1249	-0.0391
57	73	95	0.1264	0.1264	0.1206	-0.0410	0.1374	-0.0412	0.1251	-0.0404
64	73	95	0.1272	0.1271	0.1202	-0.0521	0.1370	-0.0526	0.1246	-0.0528
83	73	95	0.1261	0.1289	0.1198	-0.0597	0.1366	-0.0604	0.1242	-0.0594
92	73	95	0.1257	0.1257	0.1197	-0.0421	0.1365	-0.0426	0.1242	-0.0416
111	73	95	0.1262	0.1262	0.1197	-0.0479	0.1365	-0.0485	0.1241	-0.0476
141	73	100	0.1255	0.1255	0.1200	-0.0378	0.1368	-0.0385	0.1244	-0.0379
174	73	100	0.1342	0.1342	0.1294	-0.0315	0.1460	-0.0329	0.1339	-0.0305
207	73	100	0.1342	0.1342	0.1294	-0.0308	0.1460	-0.0328	0.1340	-0.0288
235	73	100	0.1339	0.1339	0.1294	-0.0278	0.1460	-0.0298	0.1339	-0.0288
270	72	95	0.1338	0.1338	0.1293	-0.0278	0.1460	-0.0288	0.1339	-0.0258
298	72	96	0.1339	0.1339	0.1293	-0.0288	0.1458	-0.0318	0.1336	-0.0298
327	72	95	0.1341	0.1341	0.1293	-0.0308	0.1459	-0.0328	0.1338	-0.0298
363	72	90	0.1343	0.1343	0.1295	-0.0308	0.1459	-0.0348	0.1338	-0.0318
386	74	95	0.1336	0.1335	0.1289	-0.0293	0.1455	-0.0313	0.1333	-0.0293
420	67	93	0.1347	0.1345	0.1293	-0.0358	0.1457	-0.0398	0.1337	-0.0358
448	72	95	0.1343	0.1343	0.1291	-0.0348	0.1455	-0.0388	0.1334	-0.0358
476	70	90	0.1345	0.1345	0.1289	-0.0388	0.1454	-0.0418	0.1333	-0.0388
508	70	89	0.1346	0.1346	0.1288	-0.0408	0.1453	-0.0438	0.1332	-0.0408
537	72	86	0.1336	0.1335	0.1283	-0.0353	0.1448	-0.0383	0.1327	-0.0353
564	70	92	0.1342	0.1342	0.1286	-0.0388	0.1452	-0.0408	0.1331	-0.0378
598	72	86	0.1337	0.1338	0.1281	-0.0393	0.1448	-0.0403	0.1326	-0.0383
636	72	80	0.1337	0.1337	0.1279	-0.0408	0.1445	-0.0428	0.1324	-0.0398
										Average Length Change (%)
										-0.0006
										-0.0267
										-0.0328
										-0.0396
										-0.0409
										-0.0525
										-0.0598
										-0.0421
										-0.0480
										-0.0381
										-0.0316
										-0.0308
										-0.0281
										-0.0275
										-0.0301
										-0.0311
										-0.0325
										-0.0300
										-0.0371
										-0.0365
										-0.0398
										-0.0418
										-0.0363
										-0.0391
										-0.0393
										-0.0411

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: EUCLID SR - 93

Batch id.: Material No. 6

Mixture Data: Dry Repair Material: 45,400.0 (g)

Aggregate: 0.0 (g)

Water: 4,400.0 (g)

W/M: 0.097

No aggregate added.

Specimen Age (days)	Storage Conditions			Reference Bar Reading		Room Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Final (inches)	Initial (inches)	Length Change (%)	Specimen 1		Specimen 2		Specimen 3	
						Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	70	50	0.1262	0.1262	---	0.1315	---	0.1250	---	0.1345	---
8	73	50	0.1246	0.1246	-0.0005	0.1298	-0.0011	0.1233	-0.0011	0.1329	-0.0001
28	78	42	0.1247	0.1248	-0.0292	0.1271	-0.0314	0.1204	-0.0314	0.1301	-0.0298
35	74	46	0.1256	0.1257	-0.0410	0.1268	-0.0438	0.1201	-0.0438	0.1296	-0.0439
50	70	46	0.1261	0.1262	-0.0490	0.1265	-0.0523	0.1197	-0.0523	0.1293	-0.0511
57	70	44	0.1264	0.1264	-0.0498	0.1267	-0.0535	0.1198	-0.0535	0.1295	-0.0520
64	71	50	0.1272	0.1271	-0.0603	0.1264	-0.0655	0.1194	-0.0655	0.1290	-0.0646
83	73	50	0.1261	0.1289	-0.0721	0.1256	-0.0770	0.1186	-0.0770	0.1283	-0.0754
92	73	48	0.1257	0.1257	-0.0567	0.1253	-0.0607	0.1184	-0.0607	0.1279	-0.0605
111	70	37	0.1262	0.1262	-0.0596	0.1255	-0.0645	0.1186	-0.0645	0.1282	-0.0624
141	74	45	0.1255	0.1255	-0.0616	0.1246	-0.0651	0.1178	-0.0651	0.1274	-0.0636
174	73	50	0.1342	0.1342	-0.0643	0.1331	-0.0699	0.1260	-0.0699	0.1357	-0.0683
207	73	50	0.1342	0.1342	-0.0666	0.1328	-0.0718	0.1258	-0.0718	0.1355	-0.0700
235	70	45	0.1339	0.1339	-0.0686	0.1323	-0.0738	0.1253	-0.0738	0.1351	-0.0710
270	70	52	0.1338	0.1338	-0.0736	0.1322	-0.0748	0.1251	-0.0748	0.1349	-0.0720
298	68	54	0.1339	0.1339	-0.0726	0.1318	-0.0768	0.1248	-0.0768	0.1345	-0.0770
327	68	55	0.1341	0.1341	-0.0751	0.1321	-0.0808	0.1252	-0.0808	0.1349	-0.0750
363	68	55	0.1343	0.1343	-0.0751	0.1319	-0.0793	0.1250	-0.0793	0.1347	-0.0790
386	68	51	0.1336	0.1335	-0.0806	0.1313	-0.0848	0.1244	-0.0848	0.1341	-0.0775
420	66	41	0.1347	0.1345	-0.0806	0.1318	-0.0830	0.1249	-0.0830	0.1346	-0.0828
448	69	47	0.1343	0.1343	-0.0806	0.1315	-0.0850	0.1246	-0.0850	0.1343	-0.0828
476	68	42	0.1345	0.1345	-0.0846	0.1315	-0.0861	0.1245	-0.0861	0.1343	-0.0850
508	69	25	0.1346	0.1346	-0.0801	0.1314	-0.0883	0.1246	-0.0883	0.1343	-0.0861
537	67	40	0.1336	0.1335	-0.0856	0.1308	-0.0880	0.1237	-0.0880	0.1334	-0.0836
564	65	49	0.1342	0.1342	-0.0841	0.1309	-0.0868	0.1240	-0.0868	0.1337	-0.0878
598	71	60	0.1337	0.1338	-0.0826	0.1306	-0.0883	0.1237	-0.0883	0.1334	-0.0863
636	70	53	0.1337	0.1337	-0.0826	0.1307	-0.0850	0.1238	-0.0850	0.1335	-0.0848

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: EUCLID SR - 93
Batch id.: Material No. 6

Mixture Data: Dry Repair Material: 45,400.0 (g)
Aggregate: 0.0 (g) No aggregate added.
Water: 4,400.0 (g)
W/M: 0.097

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data			
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2	
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	20	0.1262	0.1262	0.1188	---	0.1043	---
8	73	20	0.1246	0.1246	0.1167	-0.0048	0.1027	-0.0003
28	73	20	0.1247	0.1248	0.1131	-0.0420	0.0987	-0.0416
35	73	20	0.1256	0.1257	0.1140	-0.0421	0.0983	-0.0443
50	73	20	0.1261	0.1262	0.1134	-0.0531	0.0991	-0.0513
57	73	20	0.1264	0.1264	0.1139	-0.0512	0.0995	-0.0499
64	73	20	0.1272	0.1271	0.1130	-0.0672	0.0986	-0.0664
83	73	20	0.1261	0.1289	0.1125	-0.0761	0.0980	-0.0758
92	73	20	0.1257	0.1257	0.1122	-0.0610	0.0976	-0.0615
111	73	20	0.1262	0.1262	0.1124	-0.0641	0.0979	-0.0638
141	73	20	0.1255	0.1255	0.1115	-0.0659	0.0970	-0.0659
174	73	20	0.1342	0.1342	0.1196	-0.0719	0.1054	-0.0691
207	73	20	0.1342	0.1342	0.1194	-0.0738	0.1052	-0.0708
235	73	20	0.1339	0.1339	0.1190	-0.0748	0.1046	-0.0738
270	72	20	0.1338	0.1338	0.1186	-0.0778	0.1044	-0.0748
298	73	20	0.1339	0.1339	0.1184	-0.0808	0.1042	-0.0778
327	72	20	0.1341	0.1341	0.1185	-0.0818	0.1042	-0.0798
363	72	22	0.1343	0.1343	0.1180	-0.0888	0.1039	-0.0848
386	73	20	0.1336	0.1335	0.1175	-0.0863	0.1032	-0.0843
420	72	22	0.1347	0.1345	0.1181	-0.0908	0.1040	-0.0868
448	72	25	0.1343	0.1343	0.1181	-0.0878	0.1038	-0.0858
476	73	20	0.1345	0.1345	0.1177	-0.0938	0.1037	-0.0888
508	73	21	0.1346	0.1346	0.1038	-0.2338	0.1178	0.0512
537	72	24	0.1336	0.1335	0.1168	-0.0933	0.1027	-0.0893
564	72	30	0.1342	0.1342	0.1175	-0.0928	0.1035	-0.0878
598	72	36	0.1337	0.1336	0.1170	-0.0933	0.1030	-0.0883
636	72	33	0.1337	0.1337	0.1169	-0.0938	0.1029	-0.0888
								-0.0810

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: CONPROCO - CONPRO-SET
Batch Id.: Material No. 7

Mixture Data: Dry Repair Material: 45,400.0 (g)
Aggregate: 22,700.0 (g)
Water: 10,882.0 (g)
W/M: 0.240

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	95	0.1271	0.1270	0.1343	---	0.1454	---	0.1610	---
4	73	95	0.1264	0.1264	0.1263	-0.0736	0.1374	-0.0733	0.1533	-0.0708
11	73	95	0.1271	0.1260	0.1243	-0.0953	0.1354	-0.0944	0.1513	-0.0924
30	73	95	0.1289	0.1260	0.1228	-0.1186	0.1342	-0.1155	0.1498	-0.1157
39	73	95	0.1257	0.1256	0.1222	-0.1066	0.1334	-0.1053	0.1493	-0.1027
58	73	95	0.1262	0.1262	0.1214	-0.1208	0.1326	-0.1187	0.1485	-0.1165
88	73	100	0.1255	0.1255	0.1225	-0.1030	0.1336	-0.1021	0.1496	-0.0987
121	73	95	0.1342	0.1342	0.1325	-0.0896	0.1438	-0.0873	0.1597	-0.0872
154	73	95	0.1342	0.1342	0.1326	-0.0884	0.1440	-0.0851	0.1601	-0.0847
182	73	95	0.1339	0.1339	0.1325	-0.0864	0.1439	-0.0831	0.1596	-0.0825
217	73	95	0.1338	0.1338	0.1323	-0.0874	0.1439	-0.0821	0.1596	-0.0815
245	72	96	0.1339	0.1339	0.1324	-0.0874	0.1439	-0.0831	0.1597	-0.0815
274	72	95	0.1341	0.1341	0.1322	-0.0914	0.1438	-0.0861	0.1595	-0.0855
310	72	90	0.1343	0.1343	0.1322	-0.0934	0.1437	-0.0891	0.1595	-0.0875
333	74	95	0.1336	0.1335	0.1317	-0.0909	0.1432	-0.0866	0.1589	-0.0860
367	67	93	0.1347	0.1346	0.1332	-0.0869	0.1437	-0.0926	0.1595	-0.0910
395	72	95	0.1343	0.1343	0.1315	-0.1004	0.1429	-0.0971	0.1586	-0.0965
423	70	90	0.1345	0.1345	0.1315	-0.1024	0.1429	-0.0991	0.1586	-0.0985
455	70	89	0.1346	0.1346	0.1318	-0.1004	0.1432	-0.0971	0.1588	-0.0975
484	72	86	0.1336	0.1335	0.1314	-0.0939	0.1424	-0.0946	0.1580	-0.0950
511	70	92	0.1342	0.1342	0.1315	-0.0994	0.1427	-0.0981	0.1583	-0.0985
545	72	86	0.1337	0.1338	0.1309	-0.1009	0.1421	-0.0996	0.1577	-0.1000
583	72	80	0.1337	0.1337	0.1305	-0.1044	0.1418	-0.1021	0.1574	-0.1025
										-0.1030

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: CONPROCO - CONPRO-SET
 Batch Id.: Material No. 7

Mixture Data: Dry Repair Material: 45,400.0 (g)
 Aggregate: 22,700.0 (g)
 Water: 10,882.0 (g)
 W/M: 0.240

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	50	0.1271	0.1270	0.1422	---	0.1384	---	0.1763	---
4	70	44	0.1264	0.1264	0.1324	-0.0913	0.1292	-0.0853	0.1664	-0.0923
11	71	50	0.1271	0.1260	0.1280	-0.1374	0.1247	-0.1324	0.1619	-0.1388
30	73	50	0.1289	0.1260	0.1244	-0.1818	0.1209	-0.1787	0.1579	-0.1881
39	73	48	0.1257	0.1256	0.1230	-0.1771	0.1197	-0.1726	0.1564	-0.1845
58	70	37	0.1262	0.1262	0.1214	-0.1993	0.1181	-0.1945	0.1545	-0.2091
88	74	45	0.1255	0.1255	0.1193	-0.2134	0.1162	-0.2063	0.1525	-0.2228
121	73	50	0.1342	0.1342	0.1266	-0.2274	0.1236	-0.2196	0.1600	-0.2342
154	73	50	0.1342	0.1342	0.1255	-0.2382	0.1228	-0.2273	0.1590	-0.2442
182	70	45	0.1339	0.1339	0.1250	-0.2402	0.1223	-0.2293	0.1585	-0.2462
217	70	52	0.1338	0.1338	0.1254	-0.2352	0.1225	-0.2263	0.1587	-0.2432
245	68	54	0.1339	0.1339	0.1252	-0.2382	0.1225	-0.2273	0.1588	-0.2432
274	68	55	0.1341	0.1341	0.1252	-0.2402	0.1226	-0.2283	0.1588	-0.2452
310	68	55	0.1343	0.1343	0.1249	-0.2452	0.1223	-0.2333	0.1583	-0.2522
333	68	51	0.1336	0.1335	0.1241	-0.2457	0.1215	-0.2338	0.1575	-0.2527
367	66	41	0.1347	0.1346	0.1240	-0.2577	0.1215	-0.2448	0.1574	-0.2647
395	69	47	0.1343	0.1343	0.1240	-0.2542	0.1215	-0.2413	0.1575	-0.2602
423	68	42	0.1345	0.1345	0.1232	-0.2642	0.1209	-0.2493	0.1568	-0.2692
455	69	25	0.1346	0.1346	0.1226	-0.2712	0.1203	-0.2563	0.1561	-0.2772
484	67	40	0.1336	0.1335	0.1221	-0.2657	0.1198	-0.2508	0.1555	-0.2727
511	65	49	0.1342	0.1342	0.1228	-0.2652	0.1205	-0.2503	0.1563	-0.2712
545	71	60	0.1337	0.1338	0.1231	-0.2577	0.1209	-0.2418	0.1566	-0.2637
583	70	53	0.1337	0.1337	0.1237	-0.2512	0.1208	-0.2423	0.1564	-0.2652
										-0.2529

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested:

CONPROCO - CONPRO - SET

Batch id.: Material No. 7

Mixture Data: Dry Repair Material:

45,400.0 (g)

Aggregate:

22,700.0 (g)

Water:

10,882.0 (g)

W/M:

0.240

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	20	0.1271	0.1270	0.1627	---	0.1327	---	0.1587	---
4	73	20	0.1264	0.1264	0.1528	-0.0917	0.1225	-0.0958	0.1495	-0.0850
11	73	20	0.1271	0.1260	0.1473	-0.1488	0.1181	-0.1413	0.1438	-0.1442
30	73	20	0.1289	0.1260	0.1327	-0.3035	0.1237	-0.0944	0.1395	-0.1957
39	73	20	0.1257	0.1256	0.1308	-0.3040	0.1216	-0.0966	0.1373	-0.1993
58	73	20	0.1262	0.1262	0.1390	-0.2280	0.1197	-0.1215	0.1353	-0.2254
88	73	20	0.1255	0.1255	0.1463	-0.1480	0.1071	-0.2412	0.1326	-0.2456
121	73	20	0.1342	0.1342	0.1436	-0.2619	0.1145	-0.2537	0.1399	-0.2592
154	73	20	0.1342	0.1342	0.1426	-0.2719	0.1135	-0.2635	0.1390	-0.2684
182	73	20	0.1339	0.1339	0.1419	-0.2759	0.1128	-0.2675	0.1381	-0.2744
217	73	20	0.1338	0.1338	0.1415	-0.2789	0.1124	-0.2705	0.1376	-0.2784
245	73	20	0.1339	0.1339	0.1413	-0.2819	0.1123	-0.2725	0.1375	-0.2804
274	72	20	0.1341	0.1341	0.1411	-0.2859	0.1121	-0.2765	0.1373	-0.2844
310	72	22	0.1343	0.1343	0.1408	-0.2909	0.1117	-0.2825	0.1370	-0.2894
333	73	20	0.1336	0.1335	0.1301	-0.3904	0.1110	-0.2820	0.1362	-0.2899
367	72	22	0.1347	0.1346	0.1313	-0.3894	0.1121	-0.2820	0.1372	-0.2909
395	72	25	0.1343	0.1343	0.1312	-0.3869	0.1121	-0.2785	0.1373	-0.2864
423	73	20	0.1345	0.1345	0.1408	-0.2929	0.1118	-0.2835	0.1367	-0.2944
455	73	21	0.1346	0.1346	0.1409	-0.2929	0.1117	-0.2855	0.1368	-0.2944
484	72	24	0.1336	0.1335	0.1400	-0.2914	0.1109	-0.2830	0.1360	-0.2919
511	72	30	0.1342	0.1342	0.1407	-0.2909	0.1116	-0.2825	0.1367	-0.2914
545	72	36	0.1337	0.1338	0.1408	-0.2854	0.1117	-0.2770	0.1368	-0.2859
583	72	33	0.1337	0.1337	0.1407	-0.2859	0.1116	-0.2775	0.1368	-0.2854

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: FOSROC DN
Batch id.: Material No. 8

Mixture Data: Dry Repair Material: 40.860.0 (g)
Aggregate: 0.0 (g)
Water: 6.175.0 (g)
W/M: 0.151
No aggregate added.

Specimen Age (days)	Storage Conditions		Reference		Wet Storage Specimen Comparator Data						Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Bar Reading		Specimen 1		Specimen 2		Specimen 3		
			Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	73	95	0.1280	0.1280	0.1914	---	0.1424	---	0.1614	---	---
3	73	95	0.1253	0.1254	0.1886	-0.0013	0.1398	0.0007	0.1588	0.0011	0.0002
7	73	95	0.1260	0.1259	0.1886	-0.0072	0.1396	-0.0070	0.1588	-0.0052	-0.0065
12	73	95	0.1246	0.1246	0.1872	-0.0074	0.1382	-0.0074	0.1573	-0.0060	-0.0069
32	73	95	0.1246	0.1245	0.1861	-0.0185	0.1369	-0.0201	0.1559	-0.0201	-0.0196
39	73	95	0.1256	0.1257	0.1862	-0.0282	0.1372	-0.0280	0.1562	-0.0279	-0.0280
54	73	95	0.1262	0.1261	0.1858	-0.0370	0.1365	-0.0398	0.1556	-0.0393	-0.0386
61	73	95	0.1264	0.1265	0.1860	-0.0385	0.1367	-0.0415	0.1558	-0.0404	-0.0402
68	73	95	0.1260	0.1259	0.1854	-0.0400	0.1362	-0.0413	0.1552	-0.0415	-0.0409
87	73	95	0.1260	0.1259	0.1847	-0.0459	0.1354	-0.0489	0.1544	-0.0490	-0.0479
96	73	95	0.1256	0.1257	0.1847	-0.0439	0.1353	-0.0471	0.1543	-0.0467	-0.0459
115	73	95	0.1262	0.1262	0.1845	-0.0507	0.1351	-0.0543	0.1542	-0.0532	-0.0527
145	73	100	0.1255	0.1255	0.1852	-0.0370	0.1358	-0.0404	0.1549	-0.0396	-0.0390
178	73	100	0.1342	0.1342	0.1949	-0.0265	0.1455	-0.0305	0.1650	-0.0255	-0.0275
209	70	100	0.1341	0.1342	0.1952	-0.0234	0.1459	-0.0260	0.1655	-0.0200	-0.0231
237	70	100	0.1339	0.1339	0.1952	-0.0209	0.1458	-0.0245	0.1651	-0.0215	-0.0223
272	70	95	0.1338	0.1338	0.1952	-0.0199	0.1457	-0.0245	0.1651	-0.0205	-0.0216
300	72	96	0.1339	0.1338	0.1952	-0.0204	0.1457	-0.0250	0.1651	-0.0210	-0.0221
329	72	95	0.1341	0.1341	0.1951	-0.0239	0.1456	-0.0285	0.1662	-0.0125	-0.0216
365	72	90	0.1343	0.1343	0.1951	-0.0259	0.1455	-0.0315	0.1659	-0.0175	-0.0250
388	74	95	0.1336	0.1335	0.1945	-0.0244	0.1450	-0.0290	0.1644	-0.0250	-0.0261
422	67	93	0.1347	0.1346	0.1950	-0.0304	0.1453	-0.0370	0.1647	-0.0330	-0.0335
450	72	95	0.1343	0.1342	0.1944	-0.0324	0.1446	-0.0400	0.1640	-0.0360	-0.0361
478	70	90	0.1345	0.1345	0.1942	-0.0369	0.1446	-0.0425	0.1640	-0.0385	-0.0393
510	70	89	0.1346	0.1347	0.1943	-0.0374	0.1447	-0.0430	0.1641	-0.0390	-0.0398
539	72	86	0.1336	0.1335	0.1936	-0.0334	0.1439	-0.0400	0.1632	-0.0370	-0.0368
566	70	92	0.1342	0.1342	0.1940	-0.0359	0.1442	-0.0435	0.1636	-0.0395	-0.0396
600	72	86	0.1337	0.1338	0.1934	-0.0374	0.1438	-0.0430	0.1631	-0.0400	-0.0401
638	72	80	0.1337	0.1337	0.1931	-0.0399	0.1436	-0.0445	0.1629	-0.0415	-0.0420

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: FOSROC DN
 Batch id.: Material No. 8

Mixture Data: Dry Repair Material: 40.860.0 (g)
 Aggregate: 0.0 (g) No aggregate added.
 Water: 6.175.0 (g)
 W/M: 0.151

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data						Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Bar Reading		Specimen 1		Specimen 2		Specimen 3		
			Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	73	50	0.1280	0.1280	0.1600	---	0.1694	---	0.1488	---	---
3	73	50	0.1253	0.1254	0.1575	0.0021	0.1687	0.0003	0.1462	0.0009	0.0011
7	73	50	0.1260	0.1259	0.1571	-0.0084	0.1664	-0.0094	0.1458	-0.0098	-0.0092
12	73	50	0.1246	0.1246	0.1553	-0.0124	0.1646	-0.0132	0.1440	-0.0142	-0.0133
32	80	41	0.1246	0.1245	0.1529	-0.0357	0.1624	-0.0349	0.1420	-0.0338	-0.0348
39	71	46	0.1256	0.1257	0.1525	-0.0511	0.1622	-0.0483	0.1419	-0.0456	-0.0483
54	70	46	0.1262	0.1261	0.1520	-0.0615	0.1617	-0.0584	0.1414	-0.0559	-0.0586
61	70	44	0.1264	0.1265	0.1520	-0.0641	0.1617	-0.0614	0.1414	-0.0586	-0.0614
68	71	50	0.1260	0.1259	0.1515	-0.0641	0.1610	-0.0634	0.1407	-0.0608	-0.0628
87	73	50	0.1260	0.1259	0.1505	-0.0739	0.1600	-0.0732	0.1398	-0.0697	-0.0722
96	73	48	0.1256	0.1257	0.1504	-0.0721	0.1597	-0.0729	0.1396	-0.0688	-0.0713
115	70	37	0.1262	0.1262	0.1504	-0.0774	0.1599	-0.0768	0.1397	-0.0731	-0.0758
145	74	45	0.1255	0.1255	0.1498	-0.0766	0.1591	-0.0777	0.1399	-0.0740	-0.0761
178	73	50	0.1342	0.1342	0.1578	-0.0835	0.1671	-0.0852	0.1469	-0.0809	-0.0832
209	73	45	0.1341	0.1342	0.1572	-0.0890	0.1665	-0.0902	0.1464	-0.0856	-0.0883
237	70	45	0.1339	0.1339	0.1568	-0.0905	0.1662	-0.0907	0.1460	-0.0871	-0.0894
272	70	52	0.1338	0.1338	0.1566	-0.0915	0.1660	-0.0917	0.1459	-0.0871	-0.0901
300	68	54	0.1339	0.1338	0.1567	-0.0910	0.1660	-0.0922	0.1459	-0.0876	-0.0903
329	68	55	0.1341	0.1341	0.1569	-0.0915	0.1662	-0.0927	0.1461	-0.0881	-0.0908
365	68	55	0.1343	0.1343	0.1566	-0.0965	0.1660	-0.0967	0.1458	-0.0931	-0.0954
388	68	51	0.1336	0.1335	0.1560	-0.0950	0.1652	-0.0972	0.1452	-0.0916	-0.0946
422	66	41	0.1347	0.1346	0.1562	-0.1040	0.1655	-0.1052	0.1454	-0.1006	-0.1033
450	69	47	0.1343	0.1342	0.1560	-0.1020	0.1654	-0.1022	0.1453	-0.0976	-0.1006
478	68	42	0.1345	0.1345	0.1557	-0.1075	0.1651	-0.1077	0.1450	-0.1031	-0.1061
510	69	25	0.1346	0.1347	0.1554	-0.1120	0.1648	-0.1122	0.1446	-0.1086	-0.1109
539	67	40	0.1336	0.1335	0.1545	-0.1100	0.1640	-0.1092	0.1440	-0.1036	-0.1076
566	65	49	0.1342	0.1342	0.1550	-0.1115	0.1643	-0.1127	0.1444	-0.1061	-0.1101
600	71	60	0.1337	0.1338	0.1550	-0.1070	0.1644	-0.1072	0.1443	-0.1026	-0.1056
638	70	53	0.1337	0.1337	0.1551	-0.1055	0.1644	-0.1067	0.1443	-0.1021	-0.1048

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: FOSROC DN
Batch id.: Material No. 8

Mixture Data: Dry Repair Material: 40,860.0 (g)
Aggregate: 0.0 (g) No aggregate added.
Water: 6,175.0 (g)
W/M: 0.151

Specimen Age (days)	Storage Conditions		Reference		Dry Storage Specimen Comparator Data						Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Bar Reading		Specimen 1		Specimen 2		Specimen 3		
			Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	73	20	0.1280	0.1280	0.1372	---	0.1552	---	0.1330	---	---
3	73	20	0.1253	0.1254	0.1346	0.0009	0.1527	0.0021	0.1306	0.0031	0.0020
7	73	20	0.1260	0.1259	0.1341	-0.0104	0.1521	-0.0098	0.1301	-0.0088	-0.0097
12	73	20	0.1246	0.1246	0.1316	-0.0222	0.1497	-0.0204	0.1274	-0.0216	-0.0214
32	73	20	0.1246	0.1245	0.1290	-0.0475	0.1471	-0.0461	0.1251	-0.0441	-0.0459
39	73	20	0.1256	0.1257	0.1294	-0.0543	0.1474	-0.0543	0.1258	-0.0488	-0.0525
54	73	20	0.1262	0.1261	0.1288	-0.0658	0.1469	-0.0645	0.1248	-0.0634	-0.0646
61	73	20	0.1264	0.1265	0.1293	-0.0636	0.1473	-0.0630	0.1254	-0.0604	-0.0624
68	73	20	0.1260	0.1259	0.1280	-0.0717	0.1461	-0.0700	0.1241	-0.0683	-0.0700
87	73	20	0.1260	0.1259	0.1273	-0.0781	0.1454	-0.0767	0.1233	-0.0760	-0.0769
96	73	20	0.1256	0.1257	0.1269	-0.0793	0.1449	-0.0789	0.1230	-0.0767	-0.0783
115	73	20	0.1262	0.1262	0.1271	-0.0829	0.1450	-0.0830	0.1231	-0.0810	-0.0823
145	73	20	0.1255	0.1255	0.1257	-0.0905	0.1440	-0.0868	0.1221	-0.0840	-0.0871
178	73	20	0.1342	0.1342	0.1338	-0.0957	0.1518	-0.0951	0.1303	-0.0892	-0.0933
209	73	20	0.1341	0.1342	0.1334	-0.0994	0.1514	-0.0990	0.1298	-0.0932	-0.0972
237	73	20	0.1339	0.1339	0.1327	-0.1039	0.1508	-0.1025	0.1292	-0.0967	-0.1010
272	73	20	0.1338	0.1338	0.1324	-0.1059	0.1504	-0.1055	0.1290	-0.0977	-0.1030
300	73	20	0.1339	0.1338	0.1324	-0.1064	0.1504	-0.1060	0.1290	-0.0982	-0.1035
329	73	20	0.1342	0.1342	0.1321	-0.1129	0.1502	-0.1115	0.1286	-0.1057	-0.1100
365	72	22	0.1343	0.1343	0.1319	-0.1159	0.1499	-0.1155	0.1288	-0.1047	-0.1120
388	73	20	0.1336	0.1335	0.1311	-0.1164	0.1491	-0.1160	0.1276	-0.1092	-0.1139
422	72	22	0.1347	0.1346	0.1320	-0.1184	0.1502	-0.1160	0.1284	-0.1122	-0.1155
450	72	25	0.1343	0.1342	0.1318	-0.1164	0.1498	-0.1160	0.1283	-0.1092	-0.1139
478	73	20	0.1345	0.1345	0.1316	-0.1209	0.1496	-0.1205	0.1278	-0.1167	-0.1194
510	73	21	0.1346	0.1347	0.1316	-0.1224	0.1498	-0.1200	0.1281	-0.1152	-0.1192
539	72	24	0.1336	0.1335	0.1306	-0.1214	0.1487	-0.1200	0.1270	-0.1152	-0.1189
566	72	30	0.1342	0.1342	0.1313	-0.1209	0.1493	-0.1205	0.1277	-0.1147	-0.1187
600	72	36	0.1337	0.1338	0.1311	-0.1184	0.1492	-0.1170	0.1275	-0.1122	-0.1159
638	72	33	0.1337	0.1337	0.1311	-0.1179	0.1491	-0.1175	0.1276	-0.1107	-0.1154

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 1" Prismatic Specimens)

Product being tested:

American Stone-Mix Inc., MIX #6
Batch Id.: Material No. 9

Mixture Data: Dry Repair Material:

72,640.0 (g)

Aggregate:

0.0 (g)

Water:

7,570.0 (g)

W/M:

0.104

No aggregate added.

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data						Average Length Change (%)
					Specimen 1		Specimen 2		Specimen 3		
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	73	95	0.1258	0.1258	0.1683	---	0.1523	---	0.1504	---	---
7	73	95	0.1258	0.1260	0.1685	0.0018	0.1524	-0.0002	0.1505	0.0012	0.0009
14	78	95	0.1249	0.1248	0.1664	-0.0092	0.1501	-0.0127	0.1483	-0.0108	-0.0109
21	73	95	0.1258	0.1258	0.1664	-0.0185	0.1500	-0.0233	0.1483	-0.0203	-0.0207
36	73	95	0.1261	0.1262	0.1655	-0.0309	0.1493	-0.0335	0.1474	-0.0326	-0.0323
43	73	95	0.1265	0.1264	0.1655	-0.0339	0.1493	-0.0361	0.1475	-0.0349	-0.0349
50	73	95	0.1259	0.1258	0.1649	-0.0342	0.1485	-0.0385	0.1467	-0.0366	-0.0364
69	73	95	0.1259	0.1258	0.1645	-0.0381	0.1482	-0.0418	0.1464	-0.0405	-0.0401
78	73	95	0.1257	0.1257	0.1642	-0.0393	0.1476	-0.0459	0.1459	-0.0437	-0.0430
97	73	95	0.1262	0.1262	0.1638	-0.0479	0.1473	-0.0535	0.1457	-0.0503	-0.0506
127	73	100	0.1255	0.1255	0.1643	-0.0370	0.1477	-0.0431	0.1461	-0.0393	-0.0398
170	73	100	0.1342	0.1342	0.1736	-0.0303	0.1575	-0.0318	0.1558	-0.0293	-0.0305
203	73	100	0.1342	0.1342	0.1736	-0.0303	0.1576	-0.0308	0.1559	-0.0283	-0.0298
231	70	100	0.1339	0.1340	0.1733	-0.0308	0.1573	-0.0313	0.1556	-0.0288	-0.0303
266	70	95	0.1338	0.1338	0.1728	-0.0343	0.1571	-0.0318	0.1552	-0.0313	-0.0325
294	72	96	0.1338	0.1338	0.1730	-0.0323	0.1570	-0.0328	0.1552	-0.0313	-0.0321
323	72	95	0.1341	0.1341	0.1730	-0.0353	0.1569	-0.0368	0.1553	-0.0333	-0.0351
359	72	90	0.1343	0.1343	0.1728	-0.0393	0.1568	-0.0398	0.1552	-0.0363	-0.0385
382	74	95	0.1336	0.1335	0.1723	-0.0368	0.1563	-0.0373	0.1546	-0.0348	-0.0363
416	67	93	0.1346	0.1346	0.1729	-0.0413	0.1569	-0.0418	0.1553	-0.0383	-0.0405
444	72	95	0.1342	0.1343	0.1724	-0.0428	0.1563	-0.0443	0.1547	-0.0408	-0.0426
472	70	90	0.1345	0.1345	0.1726	-0.0433	0.1564	-0.0458	0.1548	-0.0423	-0.0438
504	70	89	0.1346	0.1347	0.1727	-0.0438	0.1565	-0.0463	0.1548	-0.0438	-0.0446
533	72	86	0.1336	0.1335	0.1721	-0.0388	0.1558	-0.0423	0.1541	-0.0398	-0.0403
560	70	92	0.1342	0.1342	0.1725	-0.0413	0.1561	-0.0458	0.1546	-0.0413	-0.0428
594	72	86	0.1337	0.1338	0.1721	-0.0408	0.1557	-0.0453	0.1542	-0.0408	-0.0423
632	72	80	0.1337	0.1337	0.1720	-0.0413	0.1555	-0.0468	0.1540	-0.0423	-0.0435

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: American Stone-Mix Inc., MIX #6
Batch id.: Material No. 9

Mixture Data: Dry Repair Material: 72,640.0 (g)
 Aggregate: 0.0 (g)
 Water: 7,570.0 (g)
 W/M: 0.104
 No aggregate added.

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	50	0.1258	0.1258	0.1745	---	0.1475	---	0.1590	---
7	70	44	0.1258	0.1260	0.1705	-0.0406	0.1478	0.0023	0.1591	0.0001
14	79	42	0.1249	0.1248	0.1718	-0.0177	0.1450	-0.0154	0.1564	-0.0169
21	73	48	0.1258	0.1258	0.1710	-0.0352	0.1439	-0.0356	0.1553	-0.0358
36	70	46	0.1261	0.1262	0.1697	-0.0512	0.1429	-0.0492	0.1540	-0.0533
43	70	44	0.1265	0.1264	0.1695	-0.0564	0.1425	-0.0564	0.1537	-0.0590
50	71	50	0.1259	0.1258	0.1687	-0.0584	0.1419	-0.0570	0.1532	-0.0587
69	72	55	0.1259	0.1258	0.1678	-0.0677	0.1411	-0.0643	0.1523	-0.0676
78	73	48	0.1257	0.1257	0.1677	-0.0666	0.1410	-0.0636	0.1523	-0.0653
97	73	50	0.1262	0.1262	0.1678	-0.0711	0.1411	-0.0678	0.1524	-0.0698
127	74	45	0.1255	0.1255	0.1673	-0.0693	0.1405	-0.0669	0.1517	-0.0701
170	73	50	0.1342	0.1342	0.1755	-0.0741	0.1485	-0.0738	0.1602	-0.0718
203	73	50	0.1342	0.1342	0.1758	-0.0711	0.1488	-0.0708	0.1603	-0.0708
231	70	45	0.1339	0.1340	0.1753	-0.0736	0.1482	-0.0743	0.1600	-0.0713
266	70	52	0.1338	0.1338	0.1753	-0.0721	0.1482	-0.0728	0.1598	-0.0718
294	68	54	0.1338	0.1338	0.1753	-0.0721	0.1482	-0.0728	0.1599	-0.0719
323	68	55	0.1341	0.1341	0.1755	-0.0731	0.1484	-0.0738	0.1601	-0.0718
359	68	55	0.1343	0.1343	0.1753	-0.0771	0.1482	-0.0778	0.1599	-0.0758
382	68	51	0.1336	0.1335	0.1748	-0.0746	0.1477	-0.0753	0.1595	-0.0723
416	66	41	0.1346	0.1346	0.1751	-0.0821	0.1481	-0.0818	0.1598	-0.0798
444	69	47	0.1342	0.1343	0.1751	-0.0786	0.1481	-0.0783	0.1598	-0.0763
472	68	42	0.1345	0.1345	0.1749	-0.0831	0.1478	-0.0838	0.1595	-0.0818
504	69	25	0.1346	0.1347	0.1746	-0.0876	0.1475	-0.0883	0.1591	-0.0873
533	67	40	0.1336	0.1335	0.1741	-0.0816	0.1471	-0.0813	0.1587	-0.0803
560	65	49	0.1342	0.1342	0.1747	-0.0821	0.1476	-0.0828	0.1593	-0.0808
594	71	60	0.1337	0.1338	0.1746	-0.0786	0.1475	-0.0793	0.1593	-0.0763
632	70	53	0.1337	0.1337	0.1745	-0.0791	0.1474	-0.0798	0.1592	-0.0786

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested:

American Stone-Mix Inc., MIX #6
Batch Id.: Material No. 9

Mixture Data: Dry Repair Material: 72.640.0 (g)

Aggregate: 0.0 (g)

Water: 7.570.0 (g)

W/M: 0.104

No aggregate added.

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	20	0.1258	0.1258	0.1624	---	0.1351	---	0.1581	---
7	73	20	0.1258	0.1260	0.1626	0.0022	0.1352	0.0002	0.1582	-0.0000
14	73	20	0.1249	0.1248	0.1594	-0.0202	0.1319	-0.0231	0.1547	-0.0244
21	73	20	0.1258	0.1258	0.1590	-0.0335	0.1315	-0.0362	0.1546	-0.0357
36	73	20	0.1261	0.1262	0.1576	-0.0510	0.1301	-0.0537	0.1530	-0.0546
43	73	20	0.1265	0.1264	0.1580	-0.0498	0.1304	-0.0538	0.1533	-0.0546
50	73	20	0.1259	0.1258	0.1564	-0.0601	0.1290	-0.0619	0.1519	-0.0628
69	73	20	0.1259	0.1258	0.1556	-0.0682	0.1281	-0.0710	0.1513	-0.0693
78	73	20	0.1257	0.1257	0.1553	-0.0694	0.1277	-0.0735	0.1509	-0.0708
97	73	20	0.1262	0.1262	0.1555	-0.0718	0.1280	-0.0757	0.1511	-0.0740
127	73	20	0.1255	0.1255	0.1546	-0.0742	0.1271	-0.0776	0.1503	-0.0753
170	73	20	0.1342	0.1342	0.1633	-0.0743	0.1355	-0.0802	0.1587	-0.0781
203	73	20	0.1342	0.1342	0.1635	-0.0723	0.1358	-0.0772	0.1591	-0.0741
231	73	20	0.1339	0.1340	0.1631	-0.0738	0.1353	-0.0797	0.1585	-0.0776
266	72	20	0.1338	0.1338	0.1629	-0.0743	0.1350	-0.0812	0.1581	-0.0801
294	73	20	0.1338	0.1338	0.1628	-0.0753	0.1350	-0.0812	0.1582	-0.0791
323	72	20	0.1341	0.1341	0.1629	-0.0773	0.1351	-0.0832	0.1583	-0.0811
359	72	22	0.1343	0.1343	0.1628	-0.0803	0.1348	-0.0882	0.1581	-0.0851
382	73	20	0.1336	0.1335	0.1622	-0.0788	0.1343	-0.0857	0.1574	-0.0846
416	72	22	0.1346	0.1346	0.1632	-0.0793	0.1352	-0.0872	0.1585	-0.0841
444	72	25	0.1342	0.1343	0.1630	-0.0778	0.1350	-0.0857	0.1584	-0.0816
472	73	20	0.1345	0.1345	0.1629	-0.0813	0.1350	-0.0882	0.1582	-0.0861
504	73	21	0.1346	0.1347	0.1631	-0.0808	0.1351	-0.0887	0.1585	-0.0846
533	72	24	0.1336	0.1335	0.1621	-0.0798	0.1342	-0.0867	0.1574	-0.0846
560	72	30	0.1342	0.1342	0.1628	-0.0793	0.1349	-0.0862	0.1582	-0.0831
594	72	36	0.1337	0.1338	0.1625	-0.0778	0.1346	-0.0847	0.1579	-0.0816
632	72	33	0.1337	0.1337	0.1627	-0.0753	0.1344	-0.0862	0.1577	-0.0831

Batch id.: Material No. 10

Mixture Data: Dry Repair Material:

49,940.0 (g)

Aggregate:

22,700.0 (g)

Water:

5,678.0 (g)

W/M:

0.114

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data							
	Temp (Deg. F)	Ref. Hum. (%)	Bar Reading		Specimen 1		Specimen 2		Specimen 3		Average Length Change (%)	
			Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)		
1	73	95	1	0.1263	0.1263	---	0.1346	0.0091	0.1749	---	0.1758	---
4	73	95	4	0.1263	0.1263	0.0091	0.1355	0.0091	0.1757	0.0083	0.1768	0.0101
8	73	95	8	0.1262	0.1261	0.0110	0.1355	0.0110	0.1757	0.0097	0.1766	0.0098
15	73	95	15	0.1264	0.1264	0.0087	0.1356	0.0087	0.1758	0.0076	0.1767	0.0079
22	73	95	22	0.1259	0.1258	0.0098	0.1351	0.0098	0.1753	0.0085	0.1762	0.0090
41	73	95	41	0.1258	0.1258	0.0081	0.1349	0.0081	0.1753	0.0082	0.1762	0.0084
50	73	95	50	0.1257	0.1256	0.0076	0.1347	0.0076	0.1749	0.0060	0.1758	0.0066
69	73	95	69	0.1262	0.1263	0.0004	0.1345	0.0004	0.1747	-0.0010	0.1756	-0.0006
99	73	100	99	0.1255	0.1255	0.0074	0.1345	0.0074	0.1746	0.0052	0.1756	0.0066
132	72	100	132	0.1342	0.1341	0.0145	0.1439	0.0145	0.1843	0.0152	0.1853	0.0167
155	72	100	155	0.1341	0.1341	0.0152	0.1439	0.0152	0.1844	0.0169	0.1853	0.0173
183	70	100	183	0.1340	0.1339	0.0157	0.1438	0.0157	0.1843	0.0173	0.1851	0.0167
218	70	95	218	0.1338	0.1338	0.0102	0.1431	0.0102	0.1841	0.0169	0.1849	0.0163
246	72	96	246	0.1338	0.1338	0.0142	0.1435	0.0142	0.1840	0.0159	0.1848	0.0152
275	72	95	275	0.1341	0.1342	0.0118	0.1436	0.0118	0.1840	0.0124	0.1849	0.0128
311	72	90	311	0.1343	0.1343	0.0092	0.1435	0.0092	0.1839	0.0099	0.1847	0.0093
334	74	95	334	0.1336	0.1335	0.0117	0.1430	0.0117	0.1833	0.0113	0.1842	0.0118
368	67	93	368	0.1346	0.1346	0.0043	0.1433	0.0043	0.1837	0.0049	0.1845	0.0043
396	72	95	396	0.1342	0.1342	0.0062	0.1431	0.0062	0.1834	0.0059	0.1842	0.0052
424	70	90	424	0.1345	0.1345	0.0027	0.1430	0.0027	0.1834	0.0029	0.1842	0.0023
456	70	89	456	0.1345	0.1346	0.0007	0.1429	0.0007	0.1833	0.0013	0.1841	0.0008
485	72	86	485	0.1336	0.1335	0.0048	0.1423	0.0048	0.1826	0.0044	0.1835	0.0048
512	70	92	512	0.1342	0.1342	0.0012	0.1426	0.0012	0.1830	0.0018	0.1838	0.0012
546	72	86	546	0.1337	0.1338	0.0017	0.1422	0.0017	0.1826	0.0024	0.1834	0.0018
584	72	80	584	0.1337	0.1337	0.0032	0.1423	0.0032	0.1826	0.0029	0.1834	0.0023

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested:

MASTER BUILDERS - EMACOR 310

Batch id.: Material No. 10

Mixture Data: Dry Repair Material:

49,940.0 (g)

Aggregate:

22,700.0 (g)

Water:

5,678.0 (g)

W/M:

0.114

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data						Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Bar Reading		Specimen 1		Specimen 2		Specimen 3		
			Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	69	43	0.1263	0.1263	0.1635	---	0.1572	---	0.1603	---	---
4	70	46	0.1263	0.1263	0.1644	0.0084	0.1580	0.0073	0.1609	0.0066	0.0074
8	70	46	0.1262	0.1261	0.1645	0.0119	0.1582	0.0115	0.1612	0.0106	0.0113
15	70	44	0.1264	0.1264	0.1642	0.0055	0.1579	0.0053	0.1608	0.0036	0.0048
22	71	50	0.1259	0.1258	0.1633	0.0027	0.1571	0.0029	0.1598	-0.0000	0.0018
41	72	55	0.1258	0.1258	0.1623	-0.0081	0.1560	-0.0076	0.1587	-0.0110	-0.0089
50	73	50	0.1257	0.1256	0.1622	-0.0071	0.1558	-0.0087	0.1587	-0.0101	-0.0086
69	73	48	0.1262	0.1263	0.1620	-0.0143	0.1556	-0.0154	0.1586	-0.0165	-0.0154
99	74	45	0.1255	0.1255	0.1610	-0.0170	0.1545	-0.0192	0.1574	-0.0206	-0.0189
132	72	50	0.1342	0.1341	0.1688	-0.0256	0.1625	-0.0258	0.1655	-0.0265	-0.0260
155	72	50	0.1341	0.1341	0.1682	-0.0312	0.1619	-0.0313	0.1648	-0.0328	-0.0318
183	72	45	0.1340	0.1339	0.1675	-0.0367	0.1613	-0.0359	0.1641	-0.0384	-0.0370
218	70	52	0.1338	0.1338	0.1669	-0.0412	0.1607	-0.0403	0.1635	-0.0428	-0.0414
246	68	54	0.1338	0.1338	0.1669	-0.0412	0.1606	-0.0414	0.1635	-0.0428	-0.0418
275	72	55	0.1341	0.1342	0.1669	-0.0446	0.1607	-0.0438	0.1635	-0.0463	-0.0449
311	72	55	0.1343	0.1343	0.1667	-0.0482	0.1607	-0.0453	0.1632	-0.0508	-0.0481
334	68	51	0.1336	0.1335	0.1659	-0.0487	0.1596	-0.0489	0.1624	-0.0514	-0.0496
368	66	41	0.1346	0.1346	0.1662	-0.0562	0.1600	-0.0553	0.1628	-0.0578	-0.0564
396	69	47	0.1342	0.1342	0.1658	-0.0562	0.1596	-0.0554	0.1623	-0.0589	-0.0568
424	68	42	0.1345	0.1345	0.1656	-0.0612	0.1594	-0.0604	0.1623	-0.0618	-0.0611
456	69	25	0.1345	0.1346	0.1655	-0.0626	0.1592	-0.0628	0.1620	-0.0653	-0.0636
485	67	40	0.1336	0.1335	0.1647	-0.0606	0.1583	-0.0618	0.1612	-0.0633	-0.0619
512	65	49	0.1342	0.1342	0.1647	-0.0672	0.1585	-0.0664	0.1612	-0.0698	-0.0678
546	71	60	0.1337	0.1338	0.1645	-0.0647	0.1582	-0.0648	0.1612	-0.0653	-0.0649
584	70	53	0.1337	0.1337	0.1642	-0.0672	0.1579	-0.0673	0.1610	-0.0668	-0.0671

MASTER BUILDERS - EMACOR 310
Batch id.: Material No. 10

Mixture Data: Dry Repair Material:
Aggregate:
Water:
W/M:

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data									
					Specimen 1			Specimen 2			Specimen 3			Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)		
1	73	20	0.1263	0.1263	0.1649	---	0.1624	---	0.1650	---	---	---		
4	73	20	0.1263	0.1263	0.1657	0.0081	0.1633	0.0088	0.1659	0.0088	0.1659	0.0088		
8	78	20	0.1262	0.1261	0.1657	0.0096	0.1634	0.0120	0.1659	0.0102	0.1659	0.0106		
15	73	20	0.1264	0.1264	0.1659	0.0085	0.1634	0.0090	0.1661	0.0096	0.1661	0.0090		
22	73	20	0.1259	0.1258	0.1646	0.0014	0.1623	0.0041	0.1647	0.0019	0.1647	0.0025		
41	73	20	0.1258	0.1258	0.1638	-0.0063	0.1614	-0.0052	0.1640	-0.0051	0.1640	-0.0055		
50	73	20	0.1257	0.1256	0.1633	-0.0096	0.1610	-0.0077	0.1635	-0.0085	0.1635	-0.0086		
69	73	20	0.1262	0.1263	0.1633	-0.0154	0.1609	-0.0145	0.1635	-0.0141	0.1635	-0.0147		
99	73	20	0.1255	0.1255	0.1620	-0.0208	0.1595	-0.0207	0.1622	-0.0198	0.1622	-0.0205		
132	72	20	0.1342	0.1341	0.1699	-0.0285	0.1673	-0.0292	0.1700	-0.0286	0.1700	-0.0288		
155	72	20	0.1341	0.1341	0.1693	-0.0339	0.1667	-0.0348	0.1694	-0.0340	0.1694	-0.0342		
183	72	20	0.1340	0.1339	0.1686	-0.0395	0.1660	-0.0403	0.1687	-0.0396	0.1687	-0.0398		
218	72	20	0.1338	0.1338	0.1679	-0.0450	0.1653	-0.0457	0.1680	-0.0450	0.1680	-0.0452		
246	73	20	0.1338	0.1338	0.1674	-0.0500	0.1652	-0.0467	0.1676	-0.0490	0.1676	-0.0486		
275	73	20	0.1341	0.1342	0.1674	-0.0534	0.1649	-0.0532	0.1675	-0.0535	0.1675	-0.0534		
311	72	22	0.1343	0.1343	0.1670	-0.0589	0.1644	-0.0598	0.1671	-0.0590	0.1671	-0.0592		
334	73	20	0.1336	0.1335	0.1662	-0.0595	0.1637	-0.0592	0.1663	-0.0595	0.1663	-0.0594		
368	72	22	0.1346	0.1346	0.1669	-0.0629	0.1643	-0.0637	0.1670	-0.0630	0.1670	-0.0632		
396	72	25	0.1342	0.1342	0.1665	-0.0629	0.1640	-0.0628	0.1666	-0.0631	0.1666	-0.0629		
424	73	20	0.1345	0.1345	0.1663	-0.0679	0.1637	-0.0687	0.1664	-0.0681	0.1664	-0.0682		
456	73	21	0.1345	0.1346	0.1664	-0.0675	0.1638	-0.0682	0.1665	-0.0675	0.1665	-0.0677		
485	72	24	0.1336	0.1335	0.1652	-0.0694	0.1626	-0.0703	0.1654	-0.0686	0.1654	-0.0694		
512	72	30	0.1342	0.1342	0.1658	-0.0700	0.1633	-0.0698	0.1659	-0.0701	0.1659	-0.0699		
546	72	36	0.1337	0.1338	0.1653	-0.0704	0.1628	-0.0703	0.1655	-0.0695	0.1655	-0.0701		
584	72	33	0.1337	0.1337	0.1651	-0.0720	0.1626	-0.0718	0.1653	-0.0711	0.1653	-0.0716		

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO S66-CR
Batch Id.: Material No. 11

Mixture Data: Dry Repair Material: 49,940.0 (g)
Aggregate: 0.0 (g)
Water: 4,731.3 (g)
W/M: 0.095

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data					
					Specimen 1		Specimen 2		Specimen 3	
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
4	73	95	0.1263	0.1263	0.1660	---	0.1509	---	0.1523	---
14	73	95	0.1261	0.1261	0.1644	-0.0145	0.1492	-0.0148	0.1507	-0.0142
21	73	95	0.1264	0.1264	0.1641	-0.0200	0.1490	-0.0205	0.1504	-0.0199
28	73	95	0.1258	0.1258	0.1633	-0.0217	0.1481	-0.0226	0.1498	-0.0197
47	73	95	0.1259	0.1258	0.1633	-0.0221	0.1481	-0.0226	0.1496	-0.0226
56	73	95	0.1256	0.1256	0.1628	-0.0249	0.1477	-0.0252	0.1492	-0.0234
75	73	95	0.1262	0.1261	0.1626	-0.0322	0.1473	-0.0343	0.1489	-0.0317
105	73	100	0.1255	0.1255	0.1628	-0.0239	0.1475	-0.0258	0.1492	-0.0226
138	72	100	0.1342	0.1342	0.1717	-0.0219	0.1569	-0.0195	0.1584	-0.0174
171	72	100	0.1341	0.1341	0.1716	-0.0218	0.1567	-0.0199	0.1583	-0.0177
199	72	100	0.1339	0.1339	0.1714	-0.0218	0.1566	-0.0189	0.1583	-0.0157
234	72	95	0.1338	0.1338	0.1712	-0.0228	0.1564	-0.0199	0.1580	-0.0177
262	72	96	0.1338	0.1338	0.1711	-0.0238	0.1562	-0.0219	0.1579	-0.0187
291	72	95	0.1341	0.1341	0.1712	-0.0258	0.1563	-0.0239	0.1579	-0.0217
327	72	90	0.1343	0.1343	0.1710	-0.0298	0.1562	-0.0269	0.1577	-0.0257
350	74	95	0.1336	0.1335	0.1704	-0.0283	0.1556	-0.0254	0.1572	-0.0232
384	67	93	0.1346	0.1346	0.1709	-0.0338	0.1561	-0.0309	0.1576	-0.0297
412	72	95	0.1342	0.1343	0.1705	-0.0343	0.1557	-0.0314	0.1573	-0.0292
440	70	90	0.1345	0.1345	0.1705	-0.0368	0.1557	-0.0339	0.1573	-0.0317
472	70	89	0.1345	0.1347	0.1706	-0.0368	0.1559	-0.0329	0.1574	-0.0317
501	72	86	0.1336	0.1335	0.1701	-0.0313	0.1552	-0.0294	0.1567	-0.0282
528	70	92	0.1342	0.1342	0.1705	-0.0338	0.1556	-0.0319	0.1571	-0.0307
562	72	86	0.1337	0.1338	0.1702	-0.0323	0.1553	-0.0304	0.1568	-0.0292
600	72	80	0.1337	0.1337	0.1705	-0.0288	0.1555	-0.0279	0.1570	-0.0267

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO S66-CR

Batch Id.: Material No. 11

Mixture Data: Dry Repair Material: 49,940.0 (g)
Aggregate: 0.0 (g)
Water: 4,731.3 (g)
W/M: 0.095

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Initial (Inches)	Final (Inches)	Specimen 1		Specimen 2		Specimen 3	
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
4	70	47	0.1263	0.1263	0.1688	---	0.1839	---	0.1579	---
14	70	46	0.1261	0.1261	0.1685	-0.0012	0.1814	-0.0228	0.1557	-0.0204
21	70	44	0.1264	0.1264	0.1656	-0.0330	0.1808	-0.0323	0.1545	-0.0351
28	71	50	0.1258	0.1258	0.1649	-0.0335	0.1802	-0.0316	0.1537	-0.0368
47	73	50	0.1259	0.1258	0.1640	-0.0433	0.1791	-0.0427	0.1528	-0.0463
56	73	48	0.1256	0.1256	0.1640	-0.0410	0.1790	-0.0413	0.1527	-0.0450
75	73	50	0.1262	0.1261	0.1641	-0.0451	0.1791	-0.0456	0.1527	-0.0503
105	74	45	0.1255	0.1255	0.1635	-0.0448	0.1785	-0.0455	0.1521	-0.0500
138	72	50	0.1342	0.1342	0.1716	-0.0506	0.1869	-0.0486	0.1603	-0.0548
171	72	50	0.1341	0.1341	0.1714	-0.0519	0.1867	-0.0496	0.1603	-0.0539
199	70	45	0.1339	0.1339	0.1710	-0.0539	0.1863	-0.0516	0.1598	-0.0569
234	70	52	0.1338	0.1338	0.1708	-0.0549	0.1861	-0.0526	0.1595	-0.0589
262	68	54	0.1338	0.1338	0.1709	-0.0539	0.1861	-0.0526	0.1598	-0.0559
291	68	55	0.1341	0.1341	0.1712	-0.0539	0.1863	-0.0536	0.1600	-0.0569
327	68	55	0.1343	0.1343	0.1709	-0.0589	0.1861	-0.0576	0.1597	-0.0619
350	68	51	0.1336	0.1335	0.1704	-0.0564	0.1856	-0.0551	0.1590	-0.0614
384	66	41	0.1346	0.1346	0.1599	-0.1719	0.1861	-0.0606	0.1710	0.0481
412	69	47	0.1342	0.1343	0.1708	-0.0594	0.1859	-0.0591	0.1595	-0.0634
440	68	42	0.1345	0.1345	0.1708	-0.0619	0.1860	-0.0606	0.1597	-0.0639
472	69	25	0.1345	0.1347	0.1708	-0.0629	0.1859	-0.0626	0.1595	-0.0669
501	67	40	0.1336	0.1335	0.1702	-0.0584	0.1853	-0.0581	0.1589	-0.0624
528	65	49	0.1342	0.1342	0.1705	-0.0619	0.1856	-0.0616	0.1592	-0.0659
562	71	60	0.1337	0.1338	0.1704	-0.0584	0.1856	-0.0571	0.1592	-0.0614
600	70	53	0.1337	0.1337	0.1702	-0.0599	0.1854	-0.0586	0.1590	-0.0629
										Average Length Change (%)

										-0.0148
										-0.0335
										-0.0340
										-0.0441
										-0.0424
										-0.0470
										-0.0468
										-0.0513
										-0.0518
										-0.0541
										-0.0555
										-0.0541
										-0.0548
										-0.0595
										-0.0576
										-0.0615
										-0.0606
										-0.0621
										-0.0641
										-0.0596
										-0.0631
										-0.0590
										-0.0605

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO S66-CR
Batch id.: Material No. 11

Mixture Data: Dry Repair Material: 49,940.0 (g)
Aggregate: 0.0 (g)
Water: 4,731.3 (g)
W/M: 0.095

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data						
	Temp (Deg. F)	Rel. Hum. (%)	Bar Reading		Specimen 1		Specimen 2		Specimen 3		Average Length Change (%)
			Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
4	73	20	0.1263	0.1263	0.1742	---	0.1784	---	0.1746	---	---
14	73	20	0.1261	0.1261	0.1717	-0.0226	0.1760	-0.0219	0.1723	-0.0211	-0.0219
21	73	20	0.1264	0.1264	0.1714	-0.0285	0.1759	-0.0258	0.1721	-0.0261	-0.0268
28	73	20	0.1258	0.1258	0.1702	-0.0341	0.1745	-0.0340	0.1708	-0.0331	-0.0337
47	73	20	0.1259	0.1258	0.1694	-0.0428	0.1738	-0.0413	0.1701	-0.0407	-0.0416
56	73	20	0.1256	0.1256	0.1692	-0.0427	0.1735	-0.0419	0.1698	-0.0407	-0.0418
75	73	20	0.1262	0.1261	0.1694	-0.0463	0.1738	-0.0442	0.1700	-0.0449	-0.0451
105	73	20	0.1255	0.1255	0.1685	-0.0483	0.1728	-0.0486	0.1692	-0.0461	-0.0477
138	72	20	0.1342	0.1342	0.1770	-0.0509	0.1813	-0.0501	0.1776	-0.0491	-0.0500
171	72	20	0.1341	0.1341	0.1768	-0.0514	0.1813	-0.0490	0.1774	-0.0500	-0.0501
199	72	20	0.1339	0.1339	0.1764	-0.0534	0.1809	-0.0510	0.1770	-0.0520	-0.0521
234	72	20	0.1338	0.1338	0.1762	-0.0544	0.1806	-0.0530	0.1769	-0.0520	-0.0531
262	73	20	0.1338	0.1338	0.1762	-0.0544	0.1806	-0.0530	0.1768	-0.0530	-0.0535
291	73	20	0.1341	0.1341	0.1763	-0.0564	0.1808	-0.0540	0.1769	-0.0550	-0.0551
327	72	22	0.1343	0.1343	0.1760	-0.0614	0.1804	-0.0600	0.1765	-0.0610	-0.0608
350	73	20	0.1336	0.1335	0.1754	-0.0599	0.1800	-0.0565	0.1762	-0.0565	-0.0576
384	72	22	0.1346	0.1346	0.1763	-0.0614	0.1807	-0.0600	0.1767	-0.0620	-0.0611
412	72	25	0.1342	0.1343	0.1761	-0.0599	0.1807	-0.0565	0.1768	-0.0575	-0.0580
440	73	20	0.1345	0.1345	0.1761	-0.0624	0.1804	-0.0620	0.1764	-0.0640	-0.0628
472	73	21	0.1345	0.1347	0.1763	-0.0614	0.1808	-0.0590	0.1767	-0.0620	-0.0608
501	72	24	0.1336	0.1335	0.1753	-0.0609	0.1798	-0.0585	0.1758	-0.0605	-0.0600
528	72	30	0.1342	0.1342	0.1759	-0.0614	0.1805	-0.0580	0.1766	-0.0590	-0.0595
562	72	36	0.1337	0.1338	0.1756	-0.0599	0.1801	-0.0575	0.1760	-0.0605	-0.0593
600	72	33	0.1337	0.1337	0.1754	-0.0614	0.1801	-0.0570	0.1761	-0.0590	-0.0591

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: Sika - Sika TOP 111

Batch id.: Material No. 12

Mixture Data: Dry Repair Material: 27,921.0 (g)
Aggregate: 19,068.0 (g)
Comp. A: 3,785.0 (g)
W/M: 0.136

Specimen Age (days)	Storage Conditions		Reference		Wet Storage Specimen Comparator Data							
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Specimen 3		Average Length Change (%)	
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)		
1	73	95	0.1262	0.1262	0.1553	---	0.1305	---	0.1398	---	---	
20	73	95	0.1258	0.1259	0.1535	-0.0145	0.1284	-0.0172	0.1380	-0.0153	-0.0157	
29	73	95	0.1256	0.1256	0.1528	-0.0201	0.1276	-0.0226	0.1373	-0.0195	-0.0207	
48	73	95	0.1261	0.1261	0.1524	-0.0287	0.1272	-0.0314	0.1369	-0.0291	-0.0297	
78	73	100	0.1255	0.1254	0.1522	-0.0242	0.1271	-0.0262	0.1367	-0.0245	-0.0250	
111	72	100	0.1342	0.1342	0.1615	-0.0186	0.1363	-0.0215	0.1457	-0.0216	-0.0206	
144	72	100	0.1341	0.1341	0.1615	-0.0175	0.1364	-0.0198	0.1457	-0.0207	-0.0193	
172	72	100	0.1339	0.1339	0.1614	-0.0165	0.1362	-0.0198	0.1455	-0.0207	-0.0190	
207	72	95	0.1338	0.1338	0.1613	-0.0165	0.1360	-0.0208	0.1454	-0.0207	-0.0193	
235	72	96	0.1338	0.1338	0.1611	-0.0185	0.1361	-0.0198	0.1452	-0.0227	-0.0203	
264	72	95	0.1341	0.1341	0.1612	-0.0205	0.1360	-0.0238	0.1453	-0.0247	-0.0230	
300	72	90	0.1343	0.1344	0.1612	-0.0230	0.1359	-0.0273	0.1452	-0.0282	-0.0262	
323	74	95	0.1336	0.1335	0.1605	-0.0220	0.1353	-0.0253	0.1447	-0.0252	-0.0242	
357	67	93	0.1346	0.1346	0.1609	-0.0285	0.1357	-0.0318	0.1451	-0.0317	-0.0307	
385	72	95	0.1343	0.1344	0.1605	-0.0300	0.1354	-0.0323	0.1448	-0.0322	-0.0315	
413	70	90	0.1345	0.1345	0.1606	-0.0305	0.1355	-0.0328	0.1448	-0.0337	-0.0323	
445	70	89	0.1347	0.1344	0.1606	-0.0310	0.1350	-0.0383	0.1445	-0.0372	-0.0355	
474	72	86	0.1336	0.1336	0.1599	-0.0285	0.1343	-0.0358	0.1439	-0.0337	-0.0327	
501	70	92	0.1342	0.1342	0.1603	-0.0305	0.1348	-0.0368	0.1443	-0.0357	-0.0343	
535	72	86	0.1337	0.1338	0.1601	-0.0280	0.1345	-0.0353	0.1440	-0.0342	-0.0325	
573	72	80	0.1337	0.1337	0.1604	-0.0245	0.1348	-0.0318	0.1443	-0.0307	-0.0290	

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: Sika - Sika TOP 111
Batch Id.: Material No. 12

Mixture Data: Dry Repair Material: 27,921.0 (g)
Aggregate: 19,068.0 (g)
Comp. A: 3,785.0 (g)
W/M: 0.136

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Specimen 3	
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	71	50	0.1262	0.1262	0.1592	---	0.1681	---	0.1521	---
20	73	50	0.1258	0.1259	0.1560	-0.0284	0.1650	-0.0277	0.1491	-0.0265
29	73	48	0.1256	0.1256	0.1556	-0.0299	0.1647	-0.0288	0.1486	-0.0299
48	73	50	0.1261	0.1261	0.1554	-0.0368	0.1644	-0.0365	0.1483	-0.0377
78	74	45	0.1255	0.1254	0.1544	-0.0410	0.1632	-0.0415	0.1471	-0.0430
111	72	50	0.1342	0.1342	0.1624	-0.0560	0.1712	-0.0492	0.1553	-0.0486
144	72	50	0.1341	0.1341	0.1622	-0.0492	0.1709	-0.0513	0.1548	-0.0523
172	70	45	0.1339	0.1339	0.1618	-0.0512	0.1705	-0.0533	0.1544	-0.0543
207	70	52	0.1338	0.1338	0.1614	-0.0542	0.1702	-0.0553	0.1543	-0.0543
235	68	54	0.1338	0.1338	0.1616	-0.0522	0.1704	-0.0533	0.1543	-0.0533
264	68	55	0.1341	0.1341	0.1620	-0.0512	0.1706	-0.0543	0.1545	-0.0553
300	68	55	0.1343	0.1343	0.1618	-0.0552	0.1705	-0.0573	0.1544	-0.0583
323	68	51	0.1336	0.1335	0.1611	-0.0547	0.1699	-0.0558	0.1537	-0.0578
357	66	41	0.1346	0.1346	0.1618	-0.0582	0.1705	-0.0603	0.1544	-0.0613
385	69	47	0.1343	0.1344	0.1615	-0.0587	0.1703	-0.0598	0.1542	-0.0608
413	68	42	0.1345	0.1345	0.1616	-0.0592	0.1703	-0.0613	0.1542	-0.0623
445	69	25	0.1347	0.1344	0.1614	-0.0617	0.1701	-0.0638	0.1540	-0.0648
474	67	40	0.1336	0.1336	0.1607	-0.0592	0.1695	-0.0603	0.1534	-0.0613
501	65	49	0.1342	0.1342	0.1610	-0.0622	0.1698	-0.0633	0.1537	-0.0643
535	71	60	0.1337	0.1338	0.1609	-0.0587	0.1697	-0.0598	0.1536	-0.0608
573	70	53	0.1337	0.1337	0.1608	-0.0592	0.1696	-0.0603	0.1534	-0.0623
										Average Length Change (%)

										-0.0275
										-0.0296
										-0.0370
										-0.0418
										-0.0513
										-0.0509
										-0.0529
										-0.0546
										-0.0533
										-0.0536
										-0.0569
										-0.0561
										-0.0599
										-0.0598
										-0.0609
										-0.0634
										-0.0633
										-0.0633
										-0.0598
										-0.0606

LENGTH CHANGE TEST (ASTM C 157, 3" Square by 11" Prismatic Specimens)

Product being tested: Sika - Sika TOP 111
Batch Id.: Material No. 12

Mixture Data: Dry Repair Material: 27,921.0 (g)
Aggregate: 19,068.0 (g)
Comp. A: 3,785.0 (g)
W/M: 0.136

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data						Average Length Change (%)
					Specimen 1		Specimen 2		Specimen 3		
	Temp (Deg.F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	73	20	0.1262	0.1262	0.1600	---	0.1553	---	0.1450	---	---
20	73	20	0.1258	0.1259	0.1567	-0.0293	0.1523	-0.0265	0.1420	-0.0265	-0.0274
29	73	20	0.1256	0.1256	0.1558	-0.0365	0.1516	-0.0310	0.1413	-0.0312	-0.0329
48	73	20	0.1261	0.1261	0.1555	-0.0440	0.1514	-0.0375	0.1410	-0.0393	-0.0403
78	73	20	0.1255	0.1254	0.1543	-0.0497	0.1502	-0.0437	0.1398	-0.0447	-0.0460
111	72	20	0.1342	0.1342	0.1625	-0.0551	0.1585	-0.0478	0.1476	-0.0542	-0.0524
144	72	20	0.1341	0.1341	0.1623	-0.0561	0.1581	-0.0509	0.1473	-0.0561	-0.0544
172	72	20	0.1339	0.1339	0.1618	-0.0591	0.1575	-0.0549	0.1469	-0.0581	-0.0574
207	72	20	0.1338	0.1338	0.1616	-0.0601	0.1575	-0.0539	0.1467	-0.0591	-0.0577
235	73	20	0.1338	0.1338	0.1615	-0.0611	0.1572	-0.0569	0.1466	-0.0594	-0.0594
264	72	20	0.1341	0.1341	0.1616	-0.0631	0.1573	-0.0589	0.1467	-0.0621	-0.0614
300	72	22	0.1343	0.1343	0.1613	-0.0681	0.1570	-0.0639	0.1464	-0.0671	-0.0664
323	73	20	0.1336	0.1335	0.1607	-0.0666	0.1565	-0.0614	0.1459	-0.0646	-0.0642
357	72	22	0.1346	0.1346	0.1615	-0.0691	0.1573	-0.0639	0.1466	-0.0681	-0.0670
385	72	25	0.1343	0.1344	0.1614	-0.0676	0.1571	-0.0634	0.1465	-0.0666	-0.0659
413	73	20	0.1345	0.1345	0.1614	-0.0691	0.1570	-0.0659	0.1464	-0.0691	-0.0680
445	73	21	0.1347	0.1344	0.1615	-0.0686	0.1573	-0.0634	0.1466	-0.0676	-0.0665
474	72	24	0.1336	0.1336	0.1605	-0.0691	0.1563	-0.0639	0.1457	-0.0671	-0.0667
501	72	30	0.1342	0.1342	0.1611	-0.0691	0.1569	-0.0639	0.1463	-0.0671	-0.0667
535	72	36	0.1337	0.1337	0.1608	-0.0676	0.1565	-0.0634	0.1460	-0.0656	-0.0655
573	72	33	0.1337	0.1337	0.1608	-0.0671	0.1565	-0.0629	0.1460	-0.0651	-0.0650

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested:

CONPROCO - ONE SHOT

Batch id.: Material No. 3

Mixture Data:

Dry Repair Material:

72,640.0 (g)

Aggregate:

0.0 (g)

Water:

6,623.8 (g)

W/M:

0.091

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data				Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		
7	73	95	0.1270	0.1271	0.1582	---	0.1462	---	---
10	73	95	0.1265	0.1264	0.1558	-0.0182	0.1436	-0.0195	-0.0189
17	73	95	0.1257	0.1257	0.1524	-0.0451	0.1407	-0.0414	-0.0432
36	73	95	0.1258	0.1258	0.1518	-0.0521	0.1402	-0.0473	-0.0497
45	73	95	0.1267	0.1256	0.1515	-0.0588	0.1399	-0.0539	-0.0563
64	73	95	0.1262	0.1263	0.1509	-0.0655	0.1393	-0.0607	-0.0631
94	73	100	0.1257	0.1257	0.1514	-0.0548	0.1397	-0.0504	-0.0526
137	72	100	0.1342	0.1342	0.1616	-0.0382	0.1495	-0.0381	-0.0382
170	72	100	0.1342	0.1342	0.1613	-0.0410	0.1495	-0.0381	-0.0395
198	72	100	0.1340	0.1340	0.1612	-0.0399	0.1495	-0.0361	-0.0380
233	72	95	0.1340	0.1340	0.1611	-0.0410	0.1492	-0.0391	-0.0400
261	72	96	0.1340	0.1340	0.1612	-0.0399	0.1492	-0.0391	-0.0395
290	72	95	0.1341	0.1341	0.1610	-0.0429	0.1491	-0.0410	-0.0420
326	72	90	0.1343	0.1343	0.1612	-0.0429	0.1493	-0.0411	-0.0420
349	74	95	0.1336	0.1336	0.1606	-0.0420	0.1487	-0.0401	-0.0410
383	67	93	0.1347	0.1347	0.1614	-0.0449	0.1494	-0.0440	-0.0445
411	72	95	0.1343	0.1343	0.1611	-0.0440	0.1491	-0.0431	-0.0435
439	70	90	0.1346	0.1345	0.1610	-0.0474	0.1491	-0.0456	-0.0465
471	70	89	0.1346	0.1346	0.1607	-0.0509	0.1489	-0.0481	-0.0495
500	72	86	0.1336	0.1335	0.1602	-0.0454	0.1482	-0.0446	-0.0450
527	70	92	0.1342	0.1342	0.1605	-0.0490	0.1486	-0.0471	-0.0480
561	72	86	0.1337	0.1338	0.1598	-0.0515	0.1479	-0.0496	-0.0505
599	72	80	0.1337	0.1337	0.1598	-0.0510	0.1478	-0.0501	-0.0505

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch id.: Material No. 3

Mixture Data: Dry Repair Material: 72,640.0 (g)
 Aggregate: 0.0 (g)
 Water: 6,623.8 (g)
 W/M: 0.091

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data		
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Specimen 1 Length Change (%)	Average Length Change (%)
7	73	50	0.1257	0.1257	0.1577	---	---
10	70	44	0.1265	0.1264	0.1530	-0.0540	-0.0540
17	71	50	0.1257	0.1257	0.1551	-0.0258	-0.0258
36	72	55	0.1258	0.1258	0.1568	-0.0103	-0.0103
45	73	48	0.1267	0.1256	0.1565	-0.0166	-0.0166
64	70	37	0.1262	0.1263	0.1567	-0.0155	-0.0155
94	74	45	0.1257	0.1257	0.1562	-0.0148	-0.0148
137	72	50	0.1342	0.1342	0.1650	-0.0115	-0.0115
170	72	50	0.1342	0.1342	0.1649	-0.0127	-0.0127
198	70	45	0.1340	0.1340	0.1645	-0.0146	-0.0146
233	70	52	0.1340	0.1340	0.1648	-0.0116	-0.0116
261	68	54	0.1340	0.1340	0.1647	-0.0126	-0.0126
290	68	55	0.1341	0.1341	0.1648	-0.0126	-0.0126
326	68	55	0.1343	0.1343	0.1647	-0.0156	-0.0156
349	68	51	0.1336	0.1336	0.1642	-0.0136	-0.0136
383	66	41	0.1347	0.1347	0.1648	-0.0186	-0.0186
411	69	47	0.1343	0.1343	0.1646	-0.0167	-0.0167
439	68	42	0.1346	0.1345	0.1645	-0.0201	-0.0201
471	69	25	0.1346	0.1346	0.1643	-0.0226	-0.0226
500	67	40	0.1336	0.1335	0.1639	-0.0162	-0.0162
527	65	49	0.1342	0.1342	0.1644	-0.0177	-0.0177
561	71	60	0.1337	0.1338	0.1643	-0.0141	-0.0141
599	70	53	0.1337	0.1337	0.1642	-0.0146	-0.0146

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested:

CONPROCO - ONE SHOT

Batch id.: Material No. 3

Mixture Data:

Dry Repair Material:

72,640.0 (g)

Aggregate:

0.0 (g)

Water:

6,623.8 (g)

W/M:

0.091

Specimen Age (days)	Storage Conditions			Reference Bar Reading		Dry Storage Specimen Comparator Data		
	Temp (Deg. F)	Rel. Hum. (%)		Initial (Inches)	Final (Inches)	Reading (Inches)	Specimen 1 Length Change (%)	Average Length Change (%)
7	73	20		0.1257	0.1257	0.1415	---	---
10	73	20		0.1265	0.1264	0.1377	-0.0451	-0.0451
17	73	20		0.1257	0.1257	0.1382	-0.0332	-0.0332
36	73	20		0.1258	0.1258	0.1406	-0.0102	-0.0102
45	73	20		0.1267	0.1256	0.1402	-0.0181	-0.0181
64	73	20		0.1262	0.1263	0.1410	-0.0102	-0.0102
94	73	20		0.1257	0.1257	0.1398	-0.0165	-0.0165
137	72	20		0.1342	0.1342	0.1487	-0.0135	-0.0135
170	72	20		0.1342	0.1342	0.1485	-0.0149	-0.0149
198	72	20		0.1340	0.1340	0.1482	-0.0159	-0.0159
233	72	20		0.1340	0.1340	0.1483	-0.0149	-0.0149
261	73	20		0.1340	0.1340	0.1483	-0.0149	-0.0149
290	73	20		0.1341	0.1341	0.1483	-0.0159	-0.0159
326	72	22		0.1343	0.1343	0.1484	-0.0168	-0.0168
349	73	20		0.1336	0.1336	0.1576	0.0822	0.0822
383	72	22		0.1347	0.1347	0.1591	0.0862	0.0862
411	72	25		0.1343	0.1343	0.1586	0.0851	0.0851
439	73	20		0.1346	0.1345	0.1585	0.0817	0.0817
471	73	21		0.1346	0.1346	0.1588	0.0842	0.0842
500	72	24		0.1336	0.1335	0.1587	0.0937	0.0937
527	72	30		0.1342	0.1342	0.1585	0.0851	0.0851
561	72	36		0.1337	0.1338	0.1584	0.0887	0.0887
599	72	33		0.1337	0.1337	0.1581	0.0861	0.0861

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested:

American Stone-Mix Inc., MIX #6
Batch id.: Material No. 9

Mixture Data:

Dry Repair Material: 72,640.0 (g)
Aggregate: 0.0 (g)
Water: 7,570.0 (g)
W/M: 0.104

Specimen Age (days)	Storage Conditions		Reference		Wet Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Bar Reading		Specimen 1		Specimen 2		Average Length Change (%)	
			Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)		
1	73	95	0.1258	0.1259	0.1229	---	0.1184	---	---	---
14	79	95	0.1249	0.1249	0.1188	-0.0321	0.1150	-0.0254	0.0254	-0.0287
21	73	95	0.1255	0.1255	0.1173	-0.0524	0.1129	-0.0518	0.0518	-0.0521
36	73	95	0.1262	0.1262	0.1187	-0.0449	0.1140	-0.0480	0.0480	-0.0464
43	73	95	0.1264	0.1264	0.1192	-0.0428	0.1145	-0.0449	0.0449	-0.0439
50	73	95	0.1258	0.1259	0.1188	-0.0405	0.1142	-0.0426	0.0426	-0.0415
69	73	95	0.1258	0.1258	0.1183	-0.0458	0.1135	-0.0488	0.0488	-0.0473
78	73	95	0.1257	0.1257	0.1181	-0.0458	0.1135	-0.0475	0.0475	-0.0466
97	73	95	0.1262	0.1262	0.1182	-0.0501	0.1136	-0.0515	0.0515	-0.0508
127	73	100	0.1255	0.1255	0.1184	-0.0407	0.1137	-0.0435	0.0435	-0.0421
160	72	100	0.1342	0.1341	0.1278	-0.0338	0.1234	-0.0334	0.0334	-0.0336
196	72	100	0.1342	0.1342	0.1278	-0.0343	0.1233	-0.0348	0.0348	-0.0345
224	72	100	0.1339	0.1340	0.1277	-0.0328	0.1233	-0.0323	0.0323	-0.0325
259	72	95	0.1340	0.1340	0.1273	-0.0373	0.1230	-0.0358	0.0358	-0.0365
287	72	96	0.1338	0.1338	0.1274	-0.0342	0.1230	-0.0338	0.0338	-0.0340
316	72	95	0.1341	0.1341	0.1275	-0.0363	0.1230	-0.0368	0.0368	-0.0365
352	72	90	0.1343	0.1343	0.1275	-0.0383	0.1230	-0.0388	0.0388	-0.0385
382	74	95	0.1336	0.1335	0.1270	-0.0358	0.1224	-0.0373	0.0373	-0.0365
416	67	93	0.1346	0.1346	0.1277	-0.0392	0.1232	-0.0398	0.0398	-0.0395
444	72	95	0.1342	0.1343	0.1274	-0.0388	0.1229	-0.0393	0.0393	-0.0390
472	70	90	0.1345	0.1345	0.1274	-0.0413	0.1229	-0.0418	0.0418	-0.0415
504	70	89	0.1346	0.1347	0.1228	-0.0887	0.1275	-0.0027	0.0027	-0.0430
533	72	86	0.1336	0.1335	0.1269	-0.0367	0.1223	-0.0383	0.0383	-0.0375
560	70	92	0.1342	0.1342	0.1228	-0.0843	0.1274	0.0062	0.0062	-0.0390
594	72	86	0.1337	0.1338	0.1269	-0.0388	0.1223	-0.0403	0.0403	-0.0395
632	72	80	0.1337	0.1337	0.1269	-0.0383	0.1221	-0.0418	0.0418	-0.0400

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested: American Stone-Mix Inc., MIX #6
 Batch id.: Material No. 9

Mixture Data: Dry Repair Material: 72,640.0 (g)
 Aggregate: 0.0 (g)
 Water: 7,570.0 (g)
 W/M: 0.104

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data					
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Average Length Change (%)	
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)		
1	73	50	0.1258	0.1259	0.1563	---	0.1492	---	---	
14	79	42	0.1249	0.1249	0.1524	-0.0304	0.1351	-0.1323	0.1323	
21	73	48	0.1255	0.1255	0.1507	-0.0535	0.1441	-0.0475	0.0475	
36	70	46	0.1262	0.1262	0.1504	-0.0626	0.1436	-0.0596	0.0596	
43	70	44	0.1264	0.1264	0.1504	-0.0650	0.1435	-0.0629	0.0629	
50	71	50	0.1258	0.1259	0.1499	-0.0644	0.1431	-0.0614	0.0614	
69	72	55	0.1258	0.1258	0.1497	-0.0662	0.1428	-0.0642	0.0642	
78	73	48	0.1257	0.1257	0.1497	-0.0647	0.1427	-0.0636	0.0636	
97	73	50	0.1262	0.1262	0.1497	-0.0697	0.1430	-0.0658	0.0658	
127	74	45	0.1255	0.1255	0.1492	-0.0683	0.1424	-0.0648	0.0648	
160	72	50	0.1342	0.1341	0.1575	-0.0714	0.1506	-0.0692	0.0692	
196	72	50	0.1342	0.1342	0.1578	-0.0690	0.1510	-0.0658	0.0658	
224	70	45	0.1339	0.1340	0.1572	-0.0725	0.1503	-0.0703	0.0703	
259	70	52	0.1340	0.1340	0.1571	-0.0740	0.1502	-0.0718	0.0718	
287	68	54	0.1338	0.1338	0.1569	-0.0739	0.1500	-0.0718	0.0718	
316	68	55	0.1341	0.1341	0.1569	-0.0769	0.1500	-0.0748	0.0748	
352	68	55	0.1343	0.1343	0.1567	-0.0809	0.1499	-0.0778	0.0778	
382	68	51	0.1336	0.1335	0.1561	-0.0795	0.1493	-0.0763	0.0763	
416	66	41	0.1346	0.1346	0.1565	-0.0859	0.1497	-0.0828	0.0828	
444	69	47	0.1342	0.1343	0.1564	-0.0834	0.1496	-0.0803	0.0803	
472	68	42	0.1345	0.1345	0.1563	-0.0870	0.1495	-0.0838	0.0838	
504	69	25	0.1346	0.1347	0.1557	-0.0944	0.1490	-0.0903	0.0903	
533	67	40	0.1336	0.1335	0.1555	-0.0854	0.1488	-0.0813	0.0813	
560	65	49	0.1342	0.1342	0.1562	-0.0850	0.1494	-0.0818	0.0818	
594	71	60	0.1337	0.1338	0.1560	-0.0825	0.1492	-0.0793	0.0793	
632	70	53	0.1337	0.1337	0.1557	-0.0850	0.1490	-0.0808	0.0808	

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested: American Stone-Mix Inc., MIX #6
Batch id.: Material No. 9

Mixture Data: Dry Repair Material: 72,640.0 (g)
Aggregate: 0.0 (g)
Water: 7,570.0 (g)
W/M: 0.104

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Dry Storage Specimen Comparator Data			
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2	
					Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
1	73	20	0.1258	0.1259	0.1131	---	0.1227	---
14	73	20	0.1249	0.1249	0.1099	-0.0228	0.1191	-0.0268
21	73	20	0.1255	0.1255	0.1079	-0.0484	0.1175	-0.0482
36	73	20	0.1262	0.1262	0.1075	-0.0590	0.1172	-0.0581
43	73	20	0.1264	0.1264	0.1082	-0.0545	0.1178	-0.0544
50	73	20	0.1258	0.1259	0.1070	-0.0609	0.1166	-0.0611
69	73	20	0.1258	0.1258	0.1067	-0.0642	0.1165	-0.0618
78	73	20	0.1257	0.1257	0.1065	-0.0642	0.1163	-0.0621
97	73	20	0.1262	0.1262	0.1066	-0.0678	0.1165	-0.0653
127	73	20	0.1255	0.1255	0.1062	-0.0650	0.1160	-0.0632
160	72	20	0.1342	0.1341	0.1151	-0.0628	0.1246	-0.0637
196	72	20	0.1342	0.1342	0.1151	-0.0633	0.1247	-0.0633
224	72	20	0.1339	0.1340	0.1148	-0.0638	0.1244	-0.0638
259	72	20	0.1340	0.1340	0.1147	-0.0653	0.1242	-0.0663
287	73	20	0.1338	0.1338	0.1147	-0.0633	0.1243	-0.0633
316	73	20	0.1341	0.1341	0.1149	-0.0643	0.1246	-0.0632
352	72	22	0.1343	0.1343	0.1150	-0.0653	0.1245	-0.0663
382	73	20	0.1336	0.1335	0.1142	-0.0658	0.1238	-0.0658
416	72	22	0.1346	0.1346	0.1154	-0.0643	0.1250	-0.0643
444	72	25	0.1342	0.1343	0.1150	-0.0648	0.1245	-0.0658
472	73	20	0.1345	0.1345	0.1151	-0.0663	0.1246	-0.0673
504	73	21	0.1346	0.1347	0.1153	-0.0657	0.1249	-0.0657
533	72	24	0.1336	0.1335	0.1142	-0.0658	0.1238	-0.0658
560	72	30	0.1342	0.1342	0.1149	-0.0653	0.1244	-0.0663
594	72	36	0.1337	0.1338	0.1147	-0.0628	0.1243	-0.0628
632	72	33	0.1337	0.1337	0.1148	-0.0613	0.1243	-0.0623

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested:

MASTER BUILDERS - EMACO R 310

Batch id.: Material No. 10

Mixture Data:

Dry Repair Material:

49,940.0 (g)

Aggregate:

22,700.0 (g)

Water:

5,678.0 (g)

W/M:

0.114

Specimen Age (days)	Storage Conditions			Reference Bar Reading		Dry Storage Specimen Comparator Data				
	Temp (Deg. F)	Rel. Hum. (%)	Final (inches)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Average Length Change (%)
						Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	73	20	0.1263	0.1263	0.1263	0.2173	---	0.2893	---	---
4	73	20	0.1263	0.1263	0.1263	0.2190	0.0173	0.2910	0.0170	0.0171
8	78	20	0.1261	0.1261	0.1261	0.2174	0.0022	0.2893	0.0021	0.0021
15	73	20	0.1264	0.1264	0.1264	0.2163	-0.0114	0.2883	-0.0115	-0.0115
22	73	20	0.1258	0.1258	0.1258	0.2138	-0.0296	0.2857	-0.0308	-0.0302
41	73	20	0.1258	0.1258	0.1259	0.2120	-0.0484	0.2838	-0.0503	-0.0493
50	73	20	0.1256	0.1256	0.1256	0.2112	-0.0546	0.2830	-0.0561	-0.0554
69	73	20	0.1263	0.1263	0.1262	0.2109	-0.0637	0.2827	-0.0656	-0.0646
99	73	20	0.1255	0.1255	0.1255	0.2097	-0.0679	0.2815	-0.0699	-0.0689
132	72	20	0.1341	0.1341	0.1342	0.2180	-0.0720	0.2900	-0.0711	-0.0715
165	72	20	0.1341	0.1341	0.1341	0.2177	-0.0741	0.2898	-0.0730	-0.0736
193	70	20	0.1340	0.1340	0.1339	0.2174	-0.0756	0.2895	-0.0745	-0.0751
228	70	20	0.1338	0.1338	0.1338	0.2171	-0.0771	0.2892	-0.0760	-0.0766
256	73	20	0.1338	0.1338	0.1338	0.2171	-0.0771	0.2893	-0.0750	-0.0761
285	73	20	0.1341	0.1341	0.1342	0.2173	-0.0786	0.2894	-0.0775	-0.0781
321	72	22	0.1343	0.1343	0.1343	0.2173	-0.0801	0.2895	-0.0780	-0.0791
334	73	20	0.1336	0.1336	0.1335	0.2166	-0.0796	0.2887	-0.0785	-0.0791
368	72	22	0.1346	0.1346	0.1346	0.2178	-0.0781	0.2900	-0.0760	-0.0771
396	72	25	0.1342	0.1342	0.1342	0.2174	-0.0781	0.2995	0.0230	-0.0276
424	73	20	0.1345	0.1345	0.1345	0.2174	-0.0811	0.2896	-0.0790	-0.0800
456	73	21	0.1345	0.1345	0.1346	0.2177	-0.0786	0.2898	-0.0775	-0.0781
485	72	24	0.1336	0.1336	0.1335	0.2168	-0.0776	0.2888	-0.0775	-0.0776
512	72	30	0.1342	0.1342	0.1342	0.2173	-0.0791	0.2893	-0.0790	-0.0791
546	72	36	0.1337	0.1337	0.1338	0.2172	-0.0756	0.2892	-0.0755	-0.0756
584	72	33	0.1337	0.1337	0.1337	0.2170	-0.0771	0.2891	-0.0760	-0.0766

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested:

MASTER BUILDERS - EMACO R 310
Batch Id.: Material No. 10

Mixture Data:

Dry Repair Material: 49,940.0 (g)
Aggregate: 22,700.0 (g)
Water: 5,678.0 (g)
W/M: 0.114

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Room Storage Specimen Comparator Data			
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Specimen 1		Specimen 2	
1	69	43	0.1263	0.1263	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)
4	70	46	0.1263	0.1263	0.2471	---	0.2704	---
8	70	46	0.1261	0.1261	0.2490	0.0189	0.2722	0.0179
15	70	44	0.1264	0.1264	0.2474	0.0047	0.2706	0.0045
22	71	50	0.1258	0.1258	0.2457	-0.0151	0.2691	-0.0141
41	72	55	0.1258	0.1259	0.2439	-0.0268	0.2671	-0.0271
50	73	50	0.1256	0.1256	0.2319	-0.1478	0.2653	-0.0465
69	73	48	0.1263	0.1262	0.2314	-0.1501	0.2647	-0.0497
99	74	45	0.1255	0.1255	0.2310	-0.1606	0.2643	-0.0598
132	72	50	0.1341	0.1342	0.2399	-0.0640	0.2633	-0.0629
165	72	50	0.1341	0.1341	0.2480	-0.0697	0.2714	-0.0677
193	70	45	0.1340	0.1339	0.2475	-0.0742	0.2710	-0.0716
228	70	52	0.1338	0.1338	0.2473	-0.0747	0.2709	-0.0711
256	68	54	0.1338	0.1338	0.2472	-0.0742	0.2706	-0.0726
285	68	55	0.1341	0.1342	0.2474	-0.0722	0.2710	-0.0686
321	68	55	0.1343	0.1342	0.2477	-0.0727	0.2712	-0.0701
334	68	51	0.1336	0.1343	0.2475	-0.0762	0.2710	-0.0736
368	66	41	0.1346	0.1335	0.2470	-0.0737	0.2706	-0.0701
396	69	47	0.1342	0.1346	0.2474	-0.0802	0.2710	-0.0766
424	68	42	0.1345	0.1342	0.2472	-0.0782	0.2708	-0.0746
456	69	25	0.1345	0.1345	0.2473	-0.0802	0.2709	-0.0766
485	67	40	0.1345	0.1346	0.2469	-0.0847	0.2703	-0.0831
512	65	49	0.1342	0.1335	0.2463	-0.0807	0.2700	-0.0761
546	71	60	0.1337	0.1342	0.2466	-0.0842	0.2703	-0.0796
584	70	53	0.1337	0.1338	0.2469	-0.0767	0.2705	-0.0731

LENGTH CHANGE TEST (ASTM C 157, 1" Square by 11" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO R 310
Batch id.: Material No. 10

Mixture Data: Dry Repair Material: 49,940.0 (g)
Aggregate: 22,700.0 (g)
Water: 5,678.0 (g)
W/M: 0.114

Specimen Age (days)	Storage Conditions		Reference Bar Reading		Wet Storage Specimen Comparator Data				
					Specimen 1		Specimen 2		Average Length Change (%)
	Temp (Deg. F)	Rel. Hum. (%)	Initial (inches)	Final (inches)	Reading (inches)	Length Change (%)	Reading (inches)	Length Change (%)	
1	73	95	0.1263	0.1263	0.2847	---	0.2767	---	---
4	73	95	0.1263	0.1263	0.2866	0.0190	0.2786	0.0192	0.0191
8	73	95	0.1261	0.1261	0.2855	0.0101	0.2775	0.0100	0.0101
15	73	95	0.1264	0.1264	0.2851	0.0029	0.2772	0.0037	0.0033
22	73	95	0.1258	0.1258	0.2842	0.0005	0.2762	0.0004	0.0005
41	73	95	0.1258	0.1259	0.2826	-0.0162	0.2745	-0.0170	-0.0166
50	73	95	0.1256	0.1256	0.2821	-0.0190	0.2740	-0.0199	-0.0194
69	73	95	0.1263	0.1262	0.2815	-0.0313	0.2733	-0.0334	-0.0323
99	73	100	0.1255	0.1255	0.2821	-0.0181	0.2741	-0.0180	-0.0180
132	72	100	0.1341	0.1342	0.2922	-0.0036	0.2845	-0.0003	-0.0020
165	72	100	0.1341	0.1341	0.2926	0.0011	0.2846	0.0012	0.0012
193	72	100	0.1340	0.1339	0.2926	0.0026	0.2846	0.0027	0.0027
228	72	95	0.1338	0.1338	0.2927	0.0051	0.2844	0.0022	0.0037
256	72	96	0.1338	0.1338	0.2925	0.0031	0.2844	0.0022	0.0026
285	72	95	0.1341	0.1342	0.2925	-0.0004	0.2845	-0.0003	-0.0004
321	72	90	0.1343	0.1343	0.2925	-0.0019	0.2845	-0.0018	-0.0019
334	74	95	0.1336	0.1335	0.2919	-0.0004	0.2839	-0.0003	-0.0004
368	67	93	0.1346	0.1346	0.2923	-0.0069	0.2844	-0.0058	-0.0063
396	72	95	0.1342	0.1342	0.2918	-0.0079	0.2837	-0.0088	-0.0084
424	70	90	0.1345	0.1345	0.2919	-0.0099	0.2840	-0.0088	-0.0094
456	70	89	0.1345	0.1346	0.2919	-0.0104	0.2839	-0.0103	-0.0104
485	72	86	0.1336	0.1335	0.2913	-0.0064	0.2832	-0.0073	-0.0068
512	70	92	0.1342	0.1342	0.2917	-0.0089	0.2836	-0.0098	-0.0093
546	72	86	0.1337	0.1338	0.2913	-0.0084	0.2832	-0.0093	-0.0088
584	72	80	0.1337	0.1337	0.2912	-0.0089	0.2838	-0.0028	-0.0059

Appendix F

Ring Test Data

CONCRETE RING TEST

Product being tested: FOSROC - PATCHROC 10-60

Batch id. Material No. 1

Specimen Age (days)	Storage Conditions		Crack Width			Average Width (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
6	72	55	0.0005	0.0010	0.0005	0.0007
16	73	48	0.0005	0.0125	0.0170	0.0100
34	72	44	0.0045	0.0170	0.0205	0.0140
65	74	45	0.0065	0.0165	0.0195	0.0142
98	72	55	0.0100	0.0175	0.0200	0.0158
131	68	46	0.0100	0.0175	0.0210	0.0162
159	70	45	0.0115	0.0190	0.0205	0.0170
194	70	52	0.0075	0.0200	0.0190	0.0155
222	68	54	0.0105	0.0210	0.0190	0.0168
251	68	55	0.0100	0.0200	0.0195	0.0165
287	68	55	0.0110	0.0220	0.0190	0.0173
310	68	51	0.0115	0.0205	0.0195	0.0172
344	66	41	0.0115	0.0225	0.0210	0.0183
372	69	47	0.0185	0.0225	0.0215	0.0208
400	68	42	0.0185	0.0240	0.0235	0.0220
432	69	25	0.0215	0.0265	0.0285	0.0255
461	67	40	0.0200	0.0245	0.0285	0.0243
488	65	49	0.0150	0.0260	0.0290	0.0233
523	71	60	0.0150	0.0270	0.0310	0.0243
561	70	53	0.0190	0.0275	0.0320	0.0262

CONCRETE RING TEST

Product being tested: AMERICAN STONE - METROMIX 240
Batch id. Material No. 2

Specimen Age (days)	Storage Conditions (deg. F) (Rel. Hum.)		Crack #1 Width			Average Width (in.)			Crack #2 Width			Average Width (in.)			Crack #3 Width			Average Width (in.)		Cumulative Average (in.)
			A (in.)	B (in.)	C (in.)	A (in.)	B (in.)	C (in.)	A (in.)	B (in.)	C (in.)	A (in.)	B (in.)	C (in.)	A (in.)	B (in.)	C (in.)	A (in.)	Width (in.)	
22	78	42	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
29	73	48	0.0001	0.0001	0.0030	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0011
44	70	46	0.0020	0.0005	0.0040	0.0022	0.0005	0.0030	0.0095	0.0075	0.0030	0.0067	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0089
51	70	44	0.0030	0.0055	0.0090	0.0058	0.0015	0.0075	0.0015	0.0075	0.0030	0.0040	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0099
58	71	50	0.0020	0.0025	0.0045	0.0030	0.0045	0.0030	0.0045	0.0080	0.0020	0.0048	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0079
76	72	55	0.0015	0.0020	0.0050	0.0028	0.0080	0.0015	0.0080	0.0015	0.0060	0.0052	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0081
86	73	48	0.0050	0.0085	0.0090	0.0075	0.0120	0.0095	0.0120	0.0095	0.0050	0.0088	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0164
104	72	44	0.0055	0.0100	0.0075	0.0077	0.0225	0.0090	0.0225	0.0090	0.0075	0.0130	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0207
135	74	45	0.0060	0.0105	0.0035	0.0067	0.0220	0.0100	0.0220	0.0100	0.0070	0.0130	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0197
168	72	55	0.0070	0.0120	0.0045	0.0078	0.0160	0.0040	0.0160	0.0040	0.0070	0.0090	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0169
201	68	46	0.0055	0.0115	0.0105	0.0092	0.0230	0.0115	0.0230	0.0115	0.0090	0.0145	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0237
229	70	45	0.0080	0.0020	0.0075	0.0058	0.0250	0.0090	0.0250	0.0090	0.0090	0.0143	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0202
262	70	52	0.0070	0.0015	0.0080	0.0055	0.0240	0.0105	0.0240	0.0105	0.0080	0.0142	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0197
290	68	54	0.0085	0.0125	0.0085	0.0098	0.0270	0.0105	0.0270	0.0105	0.0085	0.0153	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0252
319	68	55	0.0085	0.0110	0.0135	0.0110	0.0250	0.0095	0.0250	0.0095	0.0090	0.0145	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0256
355	68	55	0.0085	0.0125	0.0090	0.0100	0.0280	0.0140	0.0280	0.0140	0.0095	0.0172	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0272
378	68	51	0.0080	0.0140	0.0095	0.0105	0.0265	0.0065	0.0265	0.0065	0.0105	0.0145	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0251
412	66	41	0.0085	0.0145	0.0140	0.0123	0.0250	0.0100	0.0250	0.0100	0.0100	0.0150	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0274
440	69	47	0.0085	0.0055	0.0125	0.0088	0.0265	0.0080	0.0265	0.0080	0.0100	0.0148	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0237
468	68	42	0.0120	0.0165	0.0140	0.0142	0.0295	0.0090	0.0295	0.0090	0.0110	0.0165	0.0170	0.0000	0.0170	0.0001	0.0000	0.0057	0.0000	0.0364
500	69	25	0.0125	0.0170	0.0155	0.0150	0.0315	0.0105	0.0315	0.0105	0.0200	0.0207	0.0180	0.0000	0.0180	0.0001	0.0000	0.0060	0.0000	0.0417
529	67	40	0.0100	0.0155	0.0080	0.0112	0.0295	0.0075	0.0295	0.0075	0.0195	0.0188	0.0195	0.0000	0.0195	0.0001	0.0000	0.0065	0.0000	0.0365
556	65	49	0.0115	0.0145	0.0155	0.0138	0.0305	0.0100	0.0305	0.0100	0.0205	0.0203	0.0195	0.0000	0.0195	0.0001	0.0000	0.0065	0.0000	0.0407
591	71	60	0.0130	0.0160	0.0110	0.0133	0.0310	0.0105	0.0310	0.0105	0.0215	0.0210	0.0220	0.0000	0.0220	0.0001	0.0000	0.0074	0.0000	0.0417
629	70	53	0.0135	0.0180	0.0120	0.0145	0.0315	0.0110	0.0315	0.0110	0.0205	0.0210	0.0225	0.0000	0.0225	0.0001	0.0000	0.0075	0.0000	0.0430

CONCRETE RING TEST

Product being tested: CONPROCO - ONE SHOT
Batch id. Material No. 3

Specimen Age (days)	Storage Conditions		Crack #1 Width			Average Width (in.)	Crack #2 Width			Average Width (in.)	Cumulative Average (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)		A (in.)	B (in.)	C (in.)		
17	71	50	0.0001	0.0005	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000	0.0002
35	72	55	0.0180	0.0060	0.0045	0.0095	0.0000	0.0000	0.0000	0.0000	0.0095
45	73	48	0.0200	0.0085	0.0135	0.0140	0.0070	0.0001	0.0001	0.0024	0.0164
63	72	44	0.0235	0.0100	0.0275	0.0203	0.0085	0.0030	0.0001	0.0039	0.0242
94	74	45	0.0250	0.0195	0.0285	0.0243	0.0085	0.0025	0.0001	0.0037	0.0280
127	72	55	0.0310	0.0205	0.0230	0.0248	0.0090	0.0055	0.0001	0.0049	0.0297
160	68	46	0.0315	0.0150	0.0175	0.0213	0.0110	0.0045	0.0001	0.0052	0.0265
198	70	45	0.0320	0.0180	0.0215	0.0238	0.0120	0.0075	0.0001	0.0065	0.0304
233	70	52	0.0330	0.0195	0.0220	0.0248	0.0115	0.0080	0.0001	0.0065	0.0314
261	68	54	0.0340	0.0215	0.0375	0.0310	0.0125	0.0130	0.0001	0.0085	0.0395
290	68	55	0.0340	0.0215	0.0245	0.0267	0.0120	0.0085	0.0001	0.0069	0.0335
325	68	55	0.0365	0.0260	0.0390	0.0338	0.0120	0.0105	0.0001	0.0075	0.0414
348	68	51	0.0420	0.0230	0.0385	0.0345	0.0130	0.0105	0.0001	0.0079	0.0424
382	66	41	0.0395	0.0240	0.0400	0.0345	0.0135	0.0095	0.0001	0.0077	0.0422
410	69	47	0.0390	0.0250	0.0280	0.0307	0.0140	0.0090	0.0001	0.0077	0.0384
438	68	42	0.0450	0.0255	0.0415	0.0373	0.0150	0.0105	0.0001	0.0085	0.0459
470	69	25	0.0485	0.0285	0.0430	0.0400	0.0195	0.0150	0.0001	0.0115	0.0515
499	67	40	0.0470	0.0270	0.0430	0.0390	0.0200	0.0140	0.0001	0.0114	0.0504
526	65	49	0.0490	0.0280	0.0440	0.0403	0.0200	0.0130	0.0001	0.0110	0.0514
561	71	60	0.0485	0.0290	0.0440	0.0405	0.0210	0.0160	0.0001	0.0124	0.0529
599	70	53	0.0485	0.0295	0.0460	0.0413	0.0210	0.0160	0.0001	0.0124	0.0537

CONCRETE RING TEST

Product being tested: FIVE STAR

Batch id. Material No. 4

Specimen Age (days)	Storage Conditions		Crack Width			Average Width (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
42	72	44	0.0000	0.0000	0.0000	0.0000
73	74	45	0.0000	0.0000	0.0000	0.0000
106	72	55	0.0000	0.0000	0.0000	0.0000
140	68	46	0.0080	0.0050	0.0025	0.0052
168	70	45	0.0150	0.0160	0.0135	0.0148
203	70	35	0.0125	0.0195	0.0120	0.0147
231	68	54	0.0120	0.0205	0.0135	0.0153
260	68	55	0.0140	0.0150	0.0160	0.0150
296	68	55	0.0140	0.0150	0.0165	0.0152
319	68	51	0.0145	0.0210	0.0180	0.0178
353	66	41	0.0145	0.0130	0.0180	0.0152
381	69	47	0.0145	0.0190	0.0180	0.0172
409	68	42	0.0185	0.0190	0.0215	0.0197
441	69	25	0.0175	0.0240	0.0225	0.0213
470	67	40	0.0175	0.0255	0.0230	0.0220
497	65	49	0.0170	0.0165	0.0235	0.0190
532	71	60	0.0205	0.0220	0.0235	0.0220
570	70	53	0.0205	0.0205	0.0250	0.0220

CONCRETE RING TEST

Product being tested: W. GRACE - FASTRACK PATCH

Batch id. Material No. 5

Specimen Age (days)	Storage Conditions		Crack Width			Average Width (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
10	73	50	0.0001	0.0001	0.0001	0.0001
11	70	47	0.0150	0.0060	0.0001	0.0070
24	71	46	0.0035	0.0035	0.0001	0.0024
39	70	46	0.0045	0.0060	0.0040	0.0048
46	70	44	0.0045	0.0025	0.0030	0.0033
43	71	50	0.0080	0.0045	0.0090	0.0072
61	72	55	0.0070	0.0100	0.0105	0.0092
71	73	48	0.0075	0.0100	0.0100	0.0092
89	72	44	0.0230	0.0135	0.0175	0.0180
120	74	45	0.0200	0.0135	0.0205	0.0180
153	72	55	0.0220	0.0175	0.0205	0.0200
186	68	46	0.0215	0.0175	0.0135	0.0175
214	70	45	0.0240	0.0195	0.0140	0.0192
249	70	52	0.0225	0.0195	0.0220	0.0213
277	68	54	0.0250	0.0210	0.0235	0.0232
306	68	55	0.0240	0.0215	0.0230	0.0228
342	68	55	0.0240	0.0225	0.0195	0.0220
365	68	51	0.0250	0.0230	0.0245	0.0242
399	66	41	0.0270	0.0245	0.0170	0.0228
427	69	47	0.0260	0.0240	0.0270	0.0257
455	68	42	0.0285	0.0246	0.0300	0.0277
487	69	25	0.0315	0.0270	0.0350	0.0312
516	67	40	0.0280	0.0285	0.0290	0.0285
543	65	49	0.0275	0.0310	0.0340	0.0308
578	71	60	0.0290	0.0335	0.0315	0.0313
616	70	53	0.0305	0.0335	0.0350	0.0330

CONCRETE RING TEST

Product being tested: EUCLID - EUCO SR-93

Batch id. Material No. 6

Specimen Age (days)	Storage Conditions		Crack Width			Average Width (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
7	73	50	0.0001	0.0001	0.0001	0.0001
8	82	48	0.0210	0.0185	0.0430	0.0275
12	73	50	0.0520	0.0560	0.0645	0.0575
22	70	47	0.0560	0.0560	0.0635	0.0585
28	80	42	0.0525	0.0565	0.0640	0.0577
35	74	46	0.0530	0.0600	0.0590	0.0573
50	70	46	0.0540	0.0610	0.0570	0.0573
57	70	44	0.0530	0.0610	0.0605	0.0582
64	71	50	0.0515	0.0600	0.0595	0.0570
82	72	55	0.0550	0.0615	0.0610	0.0592
92	73	48	0.0540	0.0615	0.0650	0.0602
110	72	44	0.0555	0.0655	0.0675	0.0628
141	74	45	0.0555	0.0670	0.0715	0.0647
174	72	55	0.0525	0.0695	0.0650	0.0623
207	68	46	0.0540	0.0660	0.0740	0.0647
235	70	45	0.0580	0.0640	0.0695	0.0638
270	70	52	0.0570	0.0655	0.0730	0.0652
298	68	54	0.0600	0.0715	0.0745	0.0687
327	68	55	0.0600	0.0665	0.0790	0.0685
363	68	55	0.0605	0.0685	0.0715	0.0668
386	68	51	0.0565	0.0705	0.0810	0.0693
420	66	41	0.0600	0.0750	0.0780	0.0710
448	69	47	0.0635	0.0690	0.0720	0.0682

Product being tested: CONPROCO - CONPRO SET

Batch id. Material No. 7

Specimen Age (days)	Storage Conditions		Crack Width			Average Width (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
4	70	44	0.0410	0.0400	0.0585	0.0465
11	71	50	0.0425	0.0455	0.0580	0.0487
29	72	55	0.0505	0.0585	0.0695	0.0595
39	73	48	0.0570	0.0565	0.0765	0.0633
57	72	44	0.0645	0.0625	0.0820	0.0697
88	74	45	0.0715	0.0725	0.0830	0.0757
121	72	55	0.0770	0.0790	0.0930	0.0830
154	68	46	0.0755	0.0760	0.0955	0.0823
182	70	45	0.0790	0.0685	0.0945	0.0807
217	70	52	0.0815	0.0910	0.0930	0.0885
235	68	54	0.0860	0.0810	0.0925	0.0865
264	68	55	0.0880	0.0930	0.0905	0.0905
300	68	55	0.0880	0.0775	0.0950	0.0868
323	68	51	0.1790	0.0995	0.1060	0.1353
357	66	41	0.1830	0.1220	0.1050	0.1292
385	69	47	0.1890	0.1345	0.1035	0.1423
413	68	42	0.1895	0.1400	0.1065	0.1453
445	69	25	0.1935	0.1435	0.1085	0.1485
474	67	40	0.1945	0.1405	0.0995	0.1448
501	65	49	0.1965	0.1095	0.1085	0.1382
536	71	60	0.1835	0.1245	0.1115	0.1398
574	70	53	0.1785	0.1140	0.1095	0.1340

CONCRETE RING TEST

Product being tested: FOSROC DN
Batch id. Material No. 8

Specimen Age (days)	Storage Conditions		Crack Width			Average Width (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
8	72	50	0.0205	0.0205	0.0190	0.0200
10	75	45	0.0225	0.0225	0.0255	0.0235
13	82	48	0.0250	0.0210	0.0295	0.0252
17	72	50	0.0265	0.0230	0.0330	0.0275
33	80	42	0.0325	0.0310	0.0380	0.0338
40	71	46	0.0315	0.0320	0.0400	0.0345
55	70	46	0.0295	0.0300	0.0380	0.0325
62	70	44	0.0320	0.0320	0.0365	0.0335
69	71	50	0.0305	0.0255	0.0160	0.0240
87	72	55	0.0245	0.0325	0.0405	0.0325
97	73	48	0.0310	0.0345	0.0435	0.0363
115	72	44	0.0320	0.0355	0.0425	0.0367
146	74	45	0.0315	0.0370	0.0250	0.0312
179	72	55	0.0355	0.0375	0.0435	0.0388
212	68	46	0.0365	0.0395	0.0405	0.0388
240	70	45	0.0405	0.0390	0.0320	0.0372
275	70	52	0.0395	0.0380	0.0410	0.0395
298	68	54	0.0395	0.0405	0.0345	0.0382
327	68	55	0.0405	0.0405	0.0335	0.0382
363	68	55	0.0405	0.0405	0.0330	0.0380
386	68	51	0.0425	0.0410	0.0440	0.0425
420	66	41	0.0420	0.0425	0.0445	0.0430
448	69	47	0.0420	0.0440	0.0455	0.0438
476	68	42	0.0430	0.0410	0.0370	0.0403
508	69	25	0.0470	0.0475	0.0495	0.0480
537	67	40	0.0450	0.0470	0.0490	0.0470
564	65	49	0.0460	0.0465	0.0390	0.0438
599	71	60	0.0480	0.0440	0.0490	0.0470
637	70	53	0.0470	0.0470	0.0395	0.0445

CONCRETE RING TEST

Product being tested: AMERICAN STONE - MIX #6Batch id. Material No. 9

Specimen Age (days)	Storage Conditions		Crack #1 Width			Average Width (in.)	Crack #2 Width			Average Width (in.)	Cumulative Average (in.)
	(deg. F)	(Rel. Hum.)	A (in.)	B (in.)	C (in.)		A (in.)	B (in.)	C (in.)		
23	73	48	0.0001	0.0040	0.0001	0.0014	0.0000	0.0000	0.0000	0.0000	0.0014
38	70	46	0.0001	0.0005	0.0005	0.0004	0.0000	0.0000	0.0000	0.0000	0.0004
45	70	44	0.0020	0.0080	0.0005	0.0035	0.0000	0.0000	0.0000	0.0000	0.0035
52	71	50	0.0015	0.0015	0.0005	0.0012	0.0005	0.0010	0.0005	0.0007	0.0018
70	72	55	0.0085	0.0110	0.0040	0.0078	0.0100	0.0063	0.0005	0.0056	0.0134
80	73	48	0.0090	0.0125	0.0215	0.0143	0.0195	0.0115	0.0005	0.0105	0.0248
98	72	44	0.0125	0.0125	0.0125	0.0125	0.0250	0.0125	0.0005	0.0127	0.0252
129	74	45	0.0130	0.0130	0.0085	0.0115	0.0175	0.0135	0.0020	0.0110	0.0225
162	72	55	0.0135	0.0175	0.0095	0.0135	0.0160	0.0150	0.0020	0.0110	0.0245
195	68	46	0.0135	0.0175	0.0095	0.0135	0.0160	0.0150	0.0020	0.0110	0.0245
223	70	45	0.0140	0.0200	0.0115	0.0152	0.0270	0.0125	0.0175	0.0190	0.0342
258	70	52	0.0170	0.0140	0.0105	0.0138	0.0315	0.0145	0.0120	0.0193	0.0332
286	68	54	0.0200	0.0150	0.0125	0.0158	0.0295	0.0100	0.0110	0.0168	0.0327
315	68	55	0.0210	0.0200	0.0130	0.0180	0.0210	0.0215	0.0250	0.0225	0.0405
351	68	55	0.0205	0.0200	0.0130	0.0178	0.0335	0.0150	0.0105	0.0197	0.0375
374	68	51	0.0245	0.0200	0.0170	0.0205	0.0320	0.0140	0.0100	0.0187	0.0392
408	66	41	0.0250	0.0195	0.0205	0.0217	0.0345	0.0160	0.0135	0.0213	0.0430
436	69	47	0.0245	0.0190	0.0160	0.0198	0.0350	0.0165	0.0175	0.0230	0.0428
464	68	42	0.0235	0.0210	0.0220	0.0222	0.0290	0.0135	0.0205	0.0210	0.0432
496	69	25	0.0255	0.0220	0.0185	0.0220	0.0365	0.0225	0.0165	0.0252	0.0472
525	67	40	0.0250	0.0205	0.0170	0.0208	0.0370	0.0425	0.0125	0.0307	0.0515
552	65	49	0.0280	0.0280	0.0200	0.0253	0.0380	0.0325	0.0180	0.0295	0.0548
587	71	60	0.0280	0.0310	0.0205	0.0265	0.0185	0.0175	0.0490	0.0283	0.0548
625	70	53	0.0285	0.0330	0.0225	0.0280	0.0425	0.0435	0.0550	0.0470	0.0750

CONCRETE RING TEST

Product being tested: EMACO R310

Batch id. Material No. 10

No cracks detected.

CONCRETE RING TEST

Product being tested: MASTER BUILDERS - EMACO S66-CR

Batch id. Material No. 11

Specimen Age (days)	Storage Conditions		Crack Width			Average Width (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
15	70	46	0.0005	0.0085	0.0080	0.0057
22	70	44	0.0020	0.0100	0.0040	0.0053
29	71	50	0.0090	0.0110	0.0125	0.0108
47	72	55	0.0085	0.0160	0.0165	0.0137
57	73	48	0.0105	0.0145	0.0195	0.0148
75	72	44	0.0145	0.0145	0.0145	0.0145
106	74	45	0.0155	0.0150	0.0220	0.0175
139	72	55	0.0160	0.0165	0.0150	0.0158
172	68	46	0.0150	0.0165	0.0135	0.0150
200	70	45	0.0125	0.0170	0.0140	0.0145
235	70	52	0.0125	0.0165	0.0150	0.0147
263	68	54	0.0135	0.0135	0.0225	0.0165
292	68	55	0.0135	0.0180	0.0155	0.0157
328	68	55	0.0150	0.0205	0.0155	0.0170
351	68	51	0.0225	0.0210	0.0160	0.0198
385	66	41	0.0140	0.0205	0.0165	0.0170
413	69	47	0.0155	0.0160	0.0180	0.0165
441	68	42	0.0180	0.0270	0.0175	0.0208
473	69	25	0.0185	0.0280	0.0325	0.0263
502	67	40	0.0190	0.0235	0.0345	0.0257
529	65	49	0.0190	0.0235	0.0310	0.0245
564	71	60	0.0190	0.0190	0.0360	0.0247
602	70	53	0.0195	0.0225	0.0535	0.0318

CONCRETE RING TEST

Product being tested: SIKA - SIKA TOP III

Batch id. Material No. 12

No cracks detected.

Appendix G

SPS Plate Test Data

SPS BEAM TEST

Product being tested: FOSROC - PATCHROC 10-60
Batch id. Material No. 1

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel. Hum.)	A (in.)	B (in.)	C (in.)	
1	73	50	2.1820	2.1770	2.2085	2.1892
1	73	50	2.1785	2.1785	2.2080	2.1883
6	72	55	2.1860	2.1845	2.2165	2.1957
16	73	48	2.1985	2.1970	2.2270	2.2075
34	72	44	2.2335	2.2310	2.2595	2.2413
65	74	45	2.2550	2.2525	2.2795	2.2623
98	72	55	2.2555	2.2525	2.2785	2.2622
131	68	46	2.2715	2.2695	2.2965	2.2792
159	70	45	2.2760	2.2690	2.2970	2.2807
194	70	52	2.2570	2.2555	2.2870	2.2665
222	68	54	2.2390	2.2365	2.2670	2.2475
251	68	55	2.2345	2.2350	2.2590	2.2428
287	68	55	2.2310	2.2310	2.2565	2.2395
310	68	51	2.2365	2.2330	2.2580	2.2425
344	66	41	2.2480	2.2465	2.2770	2.2572
372	69	47	2.2420	2.2410	2.2675	2.2502
400	68	42	2.2515	2.2480	2.2745	2.2580
432	69	25	2.2840	2.2765	2.3015	2.2873
461	67	40	2.2535	2.2525	2.2790	2.2617
488	65	49	2.2375	2.2385	2.2605	2.2455
523	71	60	2.2340	2.2305	2.2550	2.2398
561	70	53	2.2375	2.2370	2.2650	2.2465

SPS BEAM TEST

Product being tested: AMERICAN STONE - METROMIX 240

Batch id. Material No. 2

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
2	82	46	2.1260	2.1595	2.2575	2.1810
2	82	46	2.1300	2.1555	2.2560	2.1805
6	72	49	2.1275	2.1560	2.2525	2.1787
15	70	47	2.1845	2.2170	2.3320	2.2445
21	78	42	2.1975	2.2355	2.3400	2.2577
28	73	48	2.2435	2.2770	2.3845	2.3017
43	70	46	2.2805	2.3095	2.4340	2.3413
50	70	44	2.2895	2.3195	2.4410	2.3500
57	71	50	2.2975	2.3330	2.4335	2.3547
75	72	55	2.3185	2.3580	2.4570	2.3778
85	73	48	2.3300	2.3695	2.4800	2.3932
103	72	44	2.3465	2.3870	2.4990	2.4108
134	74	45	2.3710	2.4020	2.5000	2.4243
167	72	55	2.3825	2.4205	2.5265	2.4432
200	68	46	2.4075	2.4440	2.5505	2.4673
228	70	45	2.4165	2.4540	2.5540	2.4748
263	70	52	2.4085	2.4505	2.5400	2.4663
295	68	54	2.3880	2.4300	2.5375	2.4518
324	68	55	2.3880	2.4300	2.5350	2.4510
360	68	55	2.3960	2.4380	2.5480	2.4607
383	68	51	2.4030	2.4440	2.5570	2.4680
417	66	41	2.4190	2.4640	2.5675	2.4835
445	69	47	2.4170	2.4540	2.5680	2.4797
473	68	42	2.4330	2.4725	2.5775	2.4943
505	69	25	2.4505	2.4915	2.5960	2.5127
534	67	40	2.4490	2.4875	2.5910	2.5092
561	65	49	2.4350	2.4775	2.5795	2.4973
596	71	60	2.4305	2.4755	2.5725	2.4928
634	70	53	2.4400	2.4765	2.5785	2.4983

SPS BEAM TEST

Product being tested: CONPROCO - ONE SHOT

Batch id. Material No. 3

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
3	70	46	2.2005	2.1745	2.1880	2.1877
3	70	46	2.2030	2.1720	2.2045	2.1932
10	70	44	2.2685	2.2355	2.2615	2.2552
17	71	50	2.3440	2.3110	2.3380	2.3310
35	72	55	2.4290	2.4310	2.4235	2.4278
45	73	48	2.4530	2.4495	2.4490	2.4505
63	72	44	2.4810	2.4750	2.4750	2.4770
94	74	45	2.5095	2.5040	2.5225	2.5120
127	72	55	2.5270	2.5255	2.5345	2.5290
160	68	46	2.5450	2.5420	2.5580	2.5483
188	70	45	2.5520	2.5455	2.5590	2.5522
223	70	52	2.5490	2.5470	2.5525	2.5495
251	68	54	2.5210	2.5080	2.5100	2.5130
280	68	55	2.5220	2.4940	2.5100	2.5087
316	68	55	2.5250	2.5095	2.5175	2.5173
339	68	51	2.5315	2.5140	2.5190	2.5215
373	66	41	2.5350	2.5115	2.5300	2.5255
401	69	47	2.5205	2.5235	2.5325	2.5255
429	68	42	2.5480	2.5240	2.5475	2.5398
461	69	25	2.5740	2.5370	2.5555	2.5555
490	67	40	2.5610	2.5380	2.5555	2.5515
517	65	49	2.5525	2.5310	2.5505	2.5447
552	71	60	2.5440	2.5215	2.5395	2.5350
590	70	53	2.5460	2.5225	2.5490	2.5392

SPS BEAM TEST

Product being tested: FIVE STAR

Batch id. Material No. 4

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
6	74	43	2.2000	2.1880	2.2300	2.2060
14	72	55	2.1940	2.1845	2.2240	2.2008
24	73	48	2.2070	2.1955	2.2300	2.2108
42	72	44	2.2170	2.2030	2.2475	2.2225
73	74	45	2.2270	2.2110	2.2620	2.2333
106	72	55	2.2325	2.2185	2.2560	2.2357
139	68	46	2.2360	2.2195	2.2660	2.2405
167	70	45	2.2410	2.2225	2.2645	2.2427
202	70	52	2.2320	2.2175	2.2560	2.2352
230	68	54	2.2465	2.2315	2.2785	2.2522
259	68	55	2.2430	2.2345	2.2760	2.2512
295	68	55	2.2415	2.2650	2.2660	2.2575
318	68	51	2.2440	2.2270	2.2695	2.2468
352	66	41	2.2530	2.2365	2.2825	2.2573
380	69	47	2.2525	2.2320	2.2810	2.2552
408	68	42	2.2610	2.2480	2.2880	2.2657
440	69	25	2.2785	2.2640	2.3130	2.2852
469	67	40	2.2680	2.2525	2.2930	2.2712
496	65	49	2.2460	2.2370	2.2770	2.2533
531	71	60	2.2445	2.2245	2.2690	2.2460
569	70	53	2.2415	2.2285	2.2725	2.2475

SPS BEAM TEST

Product being tested: W. GRACE - FASTRACK PATCH
Batch id. Material No. 5

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
1	72	50	2.1690	2.1540	2.1770	2.1667
11	70	47	2.1665	2.1510	2.1775	2.1650
17	79	42	2.1650	2.1500	2.1760	2.1637
24	71	46	2.1675	2.1520	2.1765	2.1653
39	70	46	2.1665	2.1495	2.1760	2.1640
46	70	44	2.1655	2.1535	2.1775	2.1655
53	71	50	2.1690	2.1515	2.1810	2.1672
71	72	55	2.1705	2.1525	2.1815	2.1682
81	73	48	2.1695	2.1525	2.1785	2.1668
99	72	44	2.1680	2.1520	2.1810	2.1670
130	74	45	2.1725	2.1535	2.1830	2.1697
163	72	55	2.1700	2.1530	2.1785	2.1672
196	68	46	2.1760	2.1525	2.1805	2.1697
224	70	45	2.1965	2.1530	2.1795	2.1763
259	70	52	2.1665	2.1525	2.1790	2.1660
287	68	54	2.1705	2.1520	2.1785	2.1670
316	68	55	2.1695	2.1525	2.1800	2.1673
352	68	55	2.1700	2.1520	2.1775	2.1665
375	68	51	2.1670	2.1530	2.1775	2.1658
409	66	41	2.1685	2.1520	2.1775	2.1660
437	69	47	2.1695	2.1520	2.1810	2.1675
465	68	42	2.1710	2.1530	2.1775	2.1672
497	69	25	2.1720	2.1555	2.1790	2.1688
526	67	40	2.1740	2.1535	2.1800	2.1692
553	65	49	2.1685	2.1525	2.1785	2.1665
588	71	60	2.1715	2.1525	2.1810	2.1683
626	70	53	2.1760	2.1525	2.1790	2.1692

SPS BEAM TEST

Product being tested: EUCLID - EUCO SR-93
Batch id. Material No. 6

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
1	70	50	2.2095	2.1655	2.1970	2.1907
1	70	50	2.2095	2.2167	2.1955	2.2072
3	71	49	2.2100	2.1640	2.1950	2.1897
5	75	45	2.2105	2.1660	2.1975	2.1913
8	82	48	2.2170	2.1750	2.2055	2.1992
12	73	50	2.2330	2.1940	2.2270	2.2180
22	70	47	2.2375	2.1980	2.2260	2.2205
28	80	42	2.2445	2.2085	2.2375	2.2302
35	74	46	2.2455	2.2105	2.2555	2.2372
50	70	46	2.2485	2.2090	2.2435	2.2337
57	70	44	2.2530	2.2155	2.2535	2.2407
64	71	50	2.2580	2.2315	2.2515	2.2470
82	72	55	2.2540	2.2240	2.2510	2.2430
92	73	48	2.2545	2.2325	2.2570	2.2480
110	72	44	2.2565	2.2275	2.2565	2.2468
141	74	45	2.2560	2.2330	2.2560	2.2483
174	72	55	2.2580	2.2375	2.2560	2.2505
207	68	46	2.2610	2.2275	2.2605	2.2497
235	70	45	2.2600	2.2290	2.2610	2.2500
270	70	52	2.2580	2.2290	2.2610	2.2493
298	68	54	2.2750	2.2275	2.2800	2.2608
327	68	55	2.2695	2.2260	2.2595	2.2517
363	68	55	2.2630	2.2275	2.2570	2.2492
386	68	51	2.2580	2.2200	2.2525	2.2435
420	66	41	2.2645	2.2295	2.2605	2.2515
448	69	47	2.2595	2.2265	2.2600	2.2487
476	68	42	2.2550	2.2290	2.2590	2.2477
508	69	25	2.2600	2.2260	2.2625	2.2495
537	67	40	2.2590	2.2260	2.2600	2.2483
564	65	49	2.2555	2.2300	2.2595	2.2483
599	71	60	2.2655	2.2255	2.2595	2.2502
637	70	53	2.2615	2.2260	2.2605	2.2493

SPS BEAM TEST

Product being teste CONPROCO - CONPRO SET

Batch id. Material No. 7

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
1	73	50	2.2310	2.2070	2.2580	2.2320
1	73	50	2.2310	2.2120	2.2573	2.2334
4	70	44	2.5205	2.5170	2.5670	2.5348
11	71	50	2.7915	2.7475	2.7940	2.7777
29	72	55	3.0070	2.9730	3.0180	2.9993
39	73	48	3.0625	3.0260	3.0865	3.0583
57	72	44	3.1655	3.1345	3.1830	3.1610
88	74	45	3.2925	3.2580	3.3125	3.2877
121	72	55	3.3790	3.3405	3.3955	3.3717
154	68	46	3.4640	3.4195	3.4815	3.4550
182	70	45	3.4815	3.4445	3.5050	3.4770
217	70	52	3.4620	3.4290	3.4765	3.4558
245	68	54	3.4525	3.4400	3.4870	3.4598
274	68	55	3.5145	3.4590	3.5050	3.4928
310	68	55	3.5325	3.4985	3.5580	3.5297
333	68	51	3.5630	3.5070	3.5575	3.5425
367	66	41	3.6040	3.5600	3.6130	3.5923
395	69	47	3.6210	3.5640	3.6040	3.5963
423	68	42	3.6695	3.6180	3.6680	3.6518
455	69	25	3.7400	3.6785	3.7350	3.7178
484	67	40	3.6990	3.6520	3.6865	3.6792
511	65	49	3.6480	3.6185	3.6550	3.6405
546	71	60	3.6395	3.5860	3.6425	3.6227
584	70	53	3.6550	3.6035	3.6455	3.6347

SPS BEAM TEST

Product being tested: FOSROC DN
Batch id. Material No. 8

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
1	73	50	2.2205	2.2140	2.2440	2.2262
2	73	50	2.2175	2.2115	2.2420	2.2237
4	73	50	2.2150	2.2115	2.2430	2.2232
8	72	50	2.2195	2.2105	2.2395	2.2232
10	75	45	2.2145	2.2085	2.2375	2.2202
13	82	48	2.2180	2.2160	2.2380	2.2240
17	72	50	2.2195	2.2165	2.2395	2.2252
33	80	42	2.2730	2.2640	2.2920	2.2763
40	71	46	2.2770	2.2850	2.3015	2.2878
55	70	46	2.3375	2.3305	2.3510	2.3397
62	70	44	2.3470	2.3480	2.3685	2.3545
69	71	50	2.3715	2.3760	2.3890	2.3788
87	72	55	2.3975	2.3935	2.4115	2.4008
97	73	48	2.4055	2.4065	2.4220	2.4113
115	72	44	2.4160	2.4175	2.4360	2.4232
146	74	45	2.4410	2.4365	2.4590	2.4455
179	72	55	2.4570	2.4580	2.4770	2.4640
212	68	46	2.4925	2.4835	2.5085	2.4948
240	70	45	2.5015	2.5065	2.5220	2.5100
273	70	52	2.4900	2.4845	2.5070	2.4938
301	68	54	2.5235	2.5300	2.5530	2.5355
330	68	55	2.5400	2.5335	2.5710	2.5482
366	68	55	2.5505	2.5520	2.5830	2.5618
389	68	51	2.5550	2.5555	2.5845	2.5650
423	66	41	2.5860	2.5925	2.6160	2.5982
451	69	47	2.5855	2.5910	2.6215	2.5993
479	68	42	2.6080	2.6160	2.6415	2.6218
511	69	25	2.6470	2.6460	2.6705	2.6545
540	67	40	2.6415	2.6320	2.6610	2.6448
567	65	49	2.6225	2.6240	2.6535	2.6333
602	71	60	2.6125	2.6100	2.6390	2.6205
640	70	53	2.6125	2.6125	2.6380	2.6210

SPS BEAM TEST

Product being tested: AMERICAN STONE - MIX #6
Batch id. Material No. 9

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
1	73	50	2.1770	2.1565	2.2210	2.1848
1	73	50	2.1785	2.1575	2.2210	2.1857
10	70	47	2.1770	2.1575	2.2230	2.1858
16	78	42	2.1915	2.1680	2.2280	2.1958
23	73	48	2.2555	2.2320	2.3025	2.2633
38	70	46	2.3045	2.2860	2.3385	2.3097
45	70	44	2.3260	2.3080	2.3595	2.3312
52	71	50	2.3305	2.3125	2.3620	2.3350
70	72	55	2.3430	2.3280	2.3770	2.3493
80	73	48	2.3565	2.3385	2.3860	2.3603
98	72	44	2.3725	2.3560	2.4060	2.3782
129	74	45	2.3880	2.3695	2.4360	2.3978
162	72	55	2.3890	2.3725	2.4265	2.3960
195	68	46	2.3890	2.3725	2.4265	2.3960
223	70	45	2.4270	2.4025	2.4585	2.4293
258	70	52	2.4190	2.3975	2.4485	2.4217
286	68	54	2.4175	2.4015	2.4595	2.4262
315	68	55	2.4240	2.4085	2.4610	2.4312
351	68	55	2.4345	2.4125	2.4690	2.4387
374	68	51	2.4425	2.4200	2.4780	2.4468
408	66	41	2.4605	2.4415	2.5015	2.4678
436	69	47	2.4610	2.4410	2.5060	2.4693
464	68	42	2.4695	2.4510	2.5045	2.4750
496	69	25	2.4990	2.4795	2.5330	2.5038
525	67	40	2.4890	2.4655	2.5190	2.4912
552	65	49	2.4770	2.4575	2.5120	2.4822
587	71	60	2.4760	2.4570	2.5115	2.4815
625	70	53	2.4950	2.4750	2.5215	2.4972

SPS BEAM TEST

Product being tested: EMACO R310
Batch id. Material No. 10

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
5	69	43	2.3000	2.2440	2.2725	2.2722
5	69	43	2.3020	2.2460	2.2725	2.2735
12	70	46	2.2995	2.2440	2.2775	2.2737
19	70	44	2.3010	2.2480	2.2810	2.2767
26	71	50	2.3070	2.2635	2.2785	2.2830
44	72	55	2.3255	2.2855	2.3035	2.3048
54	73	48	2.3415	2.3050	2.3135	2.3200
72	72	44	2.3670	2.3175	2.3365	2.3403
103	74	45	2.3885	2.3430	2.3855	2.3723
136	72	55	2.4090	2.3545	2.3880	2.3838
169	68	46	2.4330	2.3795	2.4160	2.4095
197	70	45	2.4445	2.4025	2.4250	2.4240
232	70	52	2.4425	2.3990	2.4335	2.4250
260	68	54	2.4470	2.3945	2.4315	2.4243
299	68	55	2.4490	2.4060	2.4275	2.4275
335	68	55	2.4580	2.4005	2.4320	2.4302
358	68	51	2.4635	2.4065	2.4355	2.4352
392	66	41	2.4710	2.4185	2.4480	2.4458
420	69	47	2.4890	2.4180	2.4515	2.4528
448	68	42	2.4895	2.4430	2.4605	2.4643
480	69	25	2.5035	2.4555	2.4765	2.4785
509	67	40	2.4990	2.4450	2.4700	2.4713
536	65	49	2.4975	2.4485	2.4745	2.4735
571	71	60	2.4890	2.4410	2.4605	2.4635
609	70	53	2.4890	2.4410	2.4585	2.4628

SPS BEAM TEST

Product being tested: MASTER BUILDERS - EMACO S66-CR
Batch id. Material No. 11

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
4	70	47	2.2115	2.1875	2.2235	2.2075
15	70	46	2.3100	2.2970	2.3430	2.3167
22	70	44	2.3415	2.3145	2.3450	2.3337
29	71	50	2.3515	2.3395	2.3595	2.3502
47	72	55	2.3625	2.3525	2.3750	2.3633
57	73	48	2.3765	2.3680	2.3820	2.3755
75	72	44	2.3850	2.3750	2.4170	2.3923
106	74	45	2.3990	2.3885	2.4195	2.4023
139	72	55	2.4150	2.3840	2.4160	2.4050
172	68	46	2.4240	2.4025	2.4275	2.4180
200	70	45	2.4355	2.4095	2.4440	2.4297
233	70	52	2.4260	2.4150	2.4470	2.4293
261	68	54	2.3810	2.3700	2.3820	2.3777
290	68	55	2.4020	2.3780	2.4015	2.3938
325	68	55	2.4080	2.3895	2.4170	2.4048
348	68	51	2.4250	2.3960	2.4225	2.4145
382	66	41	2.4340	2.4085	2.4385	2.4270
410	69	47	2.4220	2.4050	2.4360	2.4210
438	68	42	2.4380	2.4145	2.4480	2.4335
470	69	25	2.4530	2.4315	2.4595	2.4480
499	67	40	2.4600	2.4240	2.4440	2.4427
526	65	49	2.4365	2.4135	2.4460	2.4320
561	71	60	2.4365	2.4100	2.4245	2.4237
599	70	53	2.4375	2.4170	2.4445	2.4330

Product being tested: SIKA - SIKA TOP III
Batch id. Material No. 12

Specimen Age (days)	Storage Conditions		Measurement			Average Measurement (in.)
	(deg. F)	(Rel.Hum.)	A (in.)	B (in.)	C (in.)	
1	73	50	2.2300	2.2355	2.2430	2.2362
1	73	50	2.2345	2.2345	2.2475	2.2388
8	71	50	2.2705	2.2650	2.2925	2.2760
26	72	55	2.3000	2.2970	2.3040	2.3003
36	73	48	2.3065	2.3170	2.3100	2.3112
54	72	44	2.3070	2.3230	2.3305	2.3202
85	74	45	2.3430	2.3410	2.3470	2.3437
118	72	55	2.3545	2.3425	2.3560	2.3510
151	68	46	2.3415	2.3515	2.3545	2.3492
179	70	45	2.3440	2.3550	2.3690	2.3560
214	70	52	2.3580	2.3425	2.3615	2.3540
242	68	54	2.3505	2.3570	2.3670	2.3582
271	68	55	2.3565	2.3635	2.3700	2.3633
307	68	55	2.3665	2.3680	2.3675	2.3673
330	68	51	2.3550	2.3740	2.3755	2.3682
364	66	41	2.3825	2.3735	2.3825	2.3795
392	69	47	2.3880	2.3760	2.3815	2.3818
420	68	42	2.3820	2.3820	2.3830	2.3823
452	69	25	2.3875	2.3910	2.3980	2.3922
481	67	40	2.3895	2.3840	2.3830	2.3855
508	65	49	2.3740	2.3855	2.3810	2.3802
543	71	60	2.3765	2.3760	2.3825	2.3783
581	70	53	2.3810	2.3745	2.3955	2.3837

Appendix H

Compressive Creep Data

(ASTM C 512 (1994k))¹

¹ References listed at end of main text.

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested FOSROC - PATCHROC 10-60

Batch id.: Material No. 1

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)				
	Temp. (deg. F)	Humidity (Rel. Hum.)			Reading 1		Reading 2		Length Change		Reading 1			Reading 2		Length Change	
					(inches)	(inches)	(inches)	(inches)	(millionths)	(millionths)	(inches)	(inches)		(inches)	(inches)	(millionths)	(millionths)
4	72	43	0	0	0.0732	0.0729	0.0688	0	0.0693	0.0720	0	0.0693	0	0			
4	72	43	14,467	2,025	0.0731	0.0730	0.0666	0.0583	0.0690	0.0689	-422	0.0690	0.0689	-556			
6	72	55	14,467	2,025	0.0747	0.0739	0.0690	0.0611	0.0678	0.0698	-769	0.0678	0.0698	-562			
7	73	50	14,467	2,025	0.0733	0.0730	0.0669	0.0580	0.0673	0.0667	-949	0.0673	0.0667	-837			
7	73	50	15,533	2,174	0.0732	0.0730	0.0668	0.0576	0.0700	0.0655	-737	0.0700	0.0655	-753			
16	73	48	15,533	2,174	0.0731	0.0730	0.0663	0.0568	0.0670	0.0646	-1,214	0.0670	0.0646	-1,069			
28	73	50	15,533	2,174	0.0728	0.0726	0.0660	0.0561	0.0661	0.0640	-1,326	0.0661	0.0640	-1,141			
28	73	50	18,733	2,622	0.0734	0.0738	0.0667	0.0542	0.0678	0.0630	-1,442	0.0678	0.0630	-1,382			
35	70	37	18,733	2,622	0.0726	0.0724	0.0652	0.0546	0.0659	0.0625	-1,481	0.0659	0.0625	-1,337			
65	74	45	18,733	2,622	0.0731	0.0728	0.0652	0.0549	0.0651	0.0632	-1,591	0.0651	0.0632	-1,427			
98	72	55	18,733	2,622	0.0723	0.0723	0.0651	0.0538	0.0645	0.0609	-1,793	0.0645	0.0609	-1,523			
134	71	51	18,733	2,622	0.0731	0.0732	0.0644	0.0545	0.0660	0.0610	-1,812	0.0660	0.0610	-1,641			
159	70	45	18,733	2,622	0.0708	0.0707	0.0637	0.0510	0.0631	0.0578	-1,975	0.0631	0.0578	-1,684			
194	70	52	18,733	2,622	0.0689	0.0684	0.0603	0.0486	0.0607	0.0557	-2,013	0.0607	0.0557	-1,803			
222	68	54	18,733	2,622	0.0686	0.0685	0.0605	0.0485	0.0620	0.0551	-1,900	0.0620	0.0551	-1,728			
259	68	55	18,733	2,622	0.0615	0.0613	0.0535	0.0385	0.0519	0.0455	-2,575	0.0519	0.0455	-2,234			
287	68	55	18,733	2,622	0.0615	0.0612	0.0532	0.0379	0.0516	0.0488	-2,188	0.0516	0.0488	-2,091			
313	72	51	18,733	2,622	0.0616	0.0615	0.0539	0.0379	0.0520	0.0449	-2,675	0.0520	0.0449	-2,316			
350	64	48	18,733	2,622	0.0620	0.0619	0.0527	0.0379	0.0539	0.0455	-2,462	0.0539	0.0455	-2,334			
377	68	37	18,733	2,622	0.0621	0.0620	0.0530	0.0378	0.0564	0.0447	-2,275	0.0564	0.0447	-2,241			
400	68	42	18,733	2,622	0.0621	0.0620	0.0529	0.0378	0.0529	0.0451	-2,663	0.0529	0.0451	-2,441			
432	69	25	18,733	2,622	0.0621	0.0619	0.0528	0.0372	0.0509	0.0439	-3,050	0.0509	0.0439	-2,672			
461	67	40	18,733	2,622	0.0619	0.0617	0.0519	0.0370	0.0520	0.0449	-2,737	0.0520	0.0449	-2,559			
488	65	49	18,733	2,622	0.0619	0.0619	0.0530	0.0372	0.0522	0.0454	-2,675	0.0522	0.0454	-2,459			
523	71	60	18,733	2,622	0.0621	0.0621	0.0540	0.0380	0.0542	0.0450	-2,525	0.0542	0.0450	-2,297			
561	70	53	18,733	2,622	0.0622	0.0621	0.0537	0.0375	0.0546	0.0442	-2,587	0.0546	0.0442	-2,384			
609	0	0	0	0	0.0622	0.0622	0.0562	0.0420	0.0560	0.0562	-925	0.0560	0.0562	-1,122			

$$\Delta L = \left(\left(\frac{L_{XT1} + L_{XT2}}{2} - \frac{L_{RT1} + L_{RTI}}{2} \right) - \left(\frac{L_{XO1} + L_{XO2}}{2} - \frac{L_{ROI} + L_{ROI}}{2} \right) \right) \times \frac{1000000}{4}$$

WHERE: ΔL = Length Change (millionths)
 L_{XO1} = Reading of Specimen at Casting, Reading 1.
 L_{XO2} = Reading of Specimen at Casting, Reading 2.
 L_{XT1} = Reading of Specimen at Time T, Reading 1.
 L_{XT2} = Reading of Specimen at Time T, Reading 2.
 L_{ROI} = Reading of Reference Bar at Casting, Initial.
 L_{ROF} = Reading of Reference Bar at Casting, Final.
 L_{RT1} = Reading of Reference Bar at Time T, Initial.
 L_{RTI} = Reading of Reference Bar at Time T, Final.

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested FOSROC - PATCHROC 10-60

Batch Id.: Material No. 1

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)			
	Temp. (deg. F)	Humidity (Rel. Hum.)			Reading 1		Reading 2		Length Change		Reading 1			Reading 2		Length Change (millionths)
					(inches)	(inches)	(inches)	(inches)	(millionths)	(inches)	(inches)	(inches)		(inches)	(millionths)	
4	72	43	0	0	0.0732	0.0729	0.0687	0.0695	0	0.0699	0.0692	0	0			
4	72	43	7,233	1,012	0.0731	0.0730	0.0671	0.0679	-400	0.0682	0.0682	-340	-370			
6	72	55	7,233	1,012	0.0747	0.0739	0.0686	0.0699	-281	0.0684	0.0703	-366	-324			
7	73	50	7,233	1,012	0.0733	0.0730	0.0671	0.0670	-546	0.0681	0.0675	-464	-505			
7	73	50	7,767	1,087	0.0732	0.0730	0.0672	0.0662	-620	0.0681	0.0670	-511	-566			
16	73	48	7,767	1,087	0.0731	0.0730	0.0670	0.0665	-585	0.0691	0.0681	-235	-410			
28	73	50	7,767	1,087	0.0728	0.0726	0.0664	0.0662	-622	0.0668	0.0665	-634	-628			
28	73	50	9,367	1,311	0.0734	0.0738	0.0670	0.0655	-842	0.0681	0.0690	-380	-611			
35	70	37	9,367	1,311	0.0726	0.0724	0.0664	0.0651	-704	0.0681	0.0661	-480	-592			
65	74	45	9,367	1,311	0.0731	0.0728	0.0673	0.0655	-656	0.0665	0.0659	-806	-731			
98	72	55	9,367	1,311	0.0723	0.0723	0.0673	0.0644	-623	0.0649	0.0649	-975	-799			
134	71	50	9,367	1,311	0.0731	0.0732	0.0671	0.0652	-765	0.0661	0.0662	-875	-820			
159	70	45	9,367	1,311	0.0708	0.0707	0.0648	0.0620	-853	0.0644	0.0630	-887	-870			
194	70	52	9,367	1,311	0.0689	0.0684	0.0627	0.0599	-852	0.0620	0.0601	-1,025	-939			
222	72	68	9,367	1,311	0.0686	0.0685	0.0620	0.0596	-953	0.0624	0.0602	-938	-945			
259	68	55	9,367	1,311	0.0615	0.0613	0.0551	0.0513	-1,065	0.0541	0.0521	-1,200	-1,132			
287	68	55	9,367	1,311	0.0615	0.0612	0.0550	0.0507	-1,140	0.0538	0.0515	-1,300	-1,220			
313	72	51	9,367	1,311	0.0616	0.0615	0.0547	0.0508	-1,215	0.0550	0.0528	-1,037	-1,126			
350	64	48	9,367	1,311	0.0620	0.0619	0.0551	0.0508	-1,265	0.0547	0.0512	-1,320	-1,266			
377	68	37	9,367	1,311	0.0621	0.0620	0.0556	0.0509	-1,215	0.0538	0.0517	-1,450	-1,332			
400	68	42	9,367	1,311	0.0621	0.0620	0.0552	0.0510	-1,253	0.0550	0.0528	-1,208	-1,208			
432	69	25	9,367	1,311	0.0621	0.0619	0.0540	0.0508	-1,415	0.0538	0.0511	-1,513	-1,464			
461	67	40	9,367	1,311	0.0619	0.0617	0.0555	0.0499	-1,290	0.0528	0.0519	-1,487	-1,389			
488	65	49	9,367	1,311	0.0619	0.0619	0.0550	0.0502	-1,340	0.0541	0.0509	-1,475	-1,407			
523	71	60	9,367	1,311	0.0621	0.0621	0.0550	0.0505	-1,352	0.0538	0.0520	-1,425	-1,389			
561	70	53	9,367	1,311	0.0622	0.0621	0.0551	0.0509	-1,302	0.0545	0.0522	-1,325	-1,314			
609	0	0	0	0	0.0622	0.0622	0.0549	0.0531	-1,065	0.0620	0.0530	-300	-683			

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested FOSROC - PATCHROC 10-60

Batch id.: Material No. 1

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Zero-Stress Specimens)					
							Specimen 1			Specimen 2		
	Temp. (deg. F)	Humidity (Rel. Hum.)			Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)
4	72	43	no load	0	0.0732	0.0729	0.0735	0.0700	---	0.0730	0.0689	---
4	72	43	no load	0	0.0732	0.0729	0.0735	0.0700	0	0.0730	0.0689	0
6	72	55	no load	0	0.0747	0.0739	0.0743	0.0703	-174	0.0740	0.0703	-13
7	73	50	no load	0	0.0733	0.0730	0.0732	0.0700	-66	0.0729	0.0691	-23
7	73	50	no load	0	0.0733	0.0730	0.0732	0.0700	-66	0.0729	0.0691	-23
16	73	48	no load	0	0.0731	0.0730	0.0731	0.0699	-59	0.0726	0.0688	-68
28	73	50	no load	0	0.0728	0.0726	0.0727	0.0694	-99	0.0721	0.0688	-37
28	73	50	no load	0	0.0728	0.0726	0.0727	0.0694	-99	0.0721	0.0688	-37
35	70	37	no load	0	0.0726	0.0724	0.0723	0.0692	-125	0.0718	0.0685	-62
65	74	45	no load	0	0.0731	0.0728	0.0726	0.0695	-147	0.0726	0.0689	-19
98	72	55	no load	0	0.0723	0.0723	0.0718	0.0685	-211	0.0712	0.0677	-189
134	71	50	no load	0	0.0731	0.0732	0.0720	0.0692	-316	0.0716	0.0682	-289
159	70	45	no load	0	0.0708	0.0707	0.0700	0.0668	-266	0.0691	0.0657	-314
194	70	52	no load	0	0.0699	0.0684	0.0679	0.0643	-316	0.0672	0.0637	-276
222	68	54	no load	0	0.0686	0.0685	0.0676	0.0648	-266	0.0670	0.0636	-289
259	68	55	no load	0	0.0615	0.0613	0.0606	0.0576	-254	0.0599	0.0564	-289
287	68	55	no load	0	0.0615	0.0612	0.0603	0.0573	-316	0.0597	0.0563	-314
313	72	51	no load	0	0.0616	0.0615	0.0605	0.0575	-316	0.0597	0.0563	-364
350	64	48	no load	0	0.0620	0.0619	0.0606	0.0574	-416	0.0599	0.0564	-426
377	68	37	no load	0	0.0621	0.0620	0.0605	0.0574	-454	0.0600	0.0564	-439
400	68	42	no load	0	0.0621	0.0620	0.0606	0.0576	-416	0.0600	0.0564	-439
432	69	25	no load	0	0.0621	0.0619	0.0607	0.0575	-404	0.0599	0.0563	-451
461	67	40	no load	0	0.0619	0.0617	0.0617	0.0574	-241	0.0606	0.0562	-326
488	65	49	no load	0	0.0619	0.0619	0.0608	0.0575	-366	0.0599	0.0563	-426
523	71	60	no load	0	0.0621	0.0621	0.0612	0.0579	-316	0.0601	0.0566	-414
561	70	53	no load	0	0.0622	0.0621	0.0612	0.0581	-304	0.0605	0.0569	-339
609	0	0	no load	0	0.0622	0.0622	0.0605	0.0576	-466	0.0602	0.0566	-426

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested AMERICAN STONE - METROMIX 240

Batch Id.: Material No. 2

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Reading 1		Reading 2		Length Change		Specimen 2		
					(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	
3	71	42	0	0	0.0733	0.0734	0.0720	0.0671	0	0.0719	0.0712	0	0
3	71	42	15,400	2,208	0.0734	0.0734	0.0688	0.0691	-159	0.0689	0.0709	-421	-290
5	72	55	15,400	2,208	0.0739	0.0745	0.0697	0.0690	-270	0.0680	0.0680	-1,104	-687
6	73	50	15,400	2,208	0.0730	0.0730	0.0662	0.0662	-754	0.0667	0.0656	-1,278	-1,016
6	73	50	19,400	2,781	0.0730	0.0730	0.0670	0.0674	-547	0.0674	0.0660	-1,306	-927
15	73	48	19,400	2,781	0.0730	0.0729	0.0642	0.0641	-1,255	0.0649	0.0633	-1,775	-1,515
27	73	50	19,400	2,781	0.0726	0.0726	0.0633	0.0626	-1,468	0.0634	0.0622	-2,013	-1,740
27	73	50	21,933	3,144	0.0738	0.0740	0.0623	0.0654	-1,557	0.0625	0.0618	-2,493	-2,025
34	70	37	21,933	3,144	0.0724	0.0725	0.0606	0.0615	-1,906	0.0607	0.0610	-2,451	-2,179
64	74	45	21,933	3,144	0.0728	0.0727	0.0595	0.0595	-2,361	0.0605	0.0600	-2,676	-2,519
97	72	55	21,933	3,144	0.0723	0.0723	0.0581	0.0591	-2,474	0.0582	0.0586	-3,026	-2,750
134	71	50	21,933	3,144	0.0740	0.0740	0.0590	0.0611	-2,541	0.0591	0.0604	-3,119	-2,830
159	70	45	21,933	3,144	0.0707	0.0708	0.0552	0.0561	-2,829	0.0555	0.0557	-3,344	-3,086
194	70	52	21,933	3,144	0.0684	0.0685	0.0530	0.0541	-2,779	0.0544	0.0540	-3,119	-2,949
222	68	54	21,933	3,144	0.0685	0.0685	0.0531	0.0543	-2,754	0.0537	0.0535	-3,281	-3,018
259	68	55	21,933	3,144	0.0615	0.0613	0.0429	0.0439	-3,554	0.0438	0.0435	-3,994	-3,774
287	68	55	21,933	3,144	0.0612	0.0612	0.0423	0.0435	-3,629	0.0436	0.0431	-4,019	-3,824
313	72	51	21,933	3,144	0.0615	0.0615	0.0424	0.0436	-3,679	0.0438	0.0429	-4,094	-3,866
350	64	48	21,933	3,144	0.0619	0.0619	0.0421	0.0433	-3,854	0.0431	0.0428	-4,294	-4,074
377	68	37	21,933	3,144	0.0620	0.0620	0.0428	0.0439	-3,716	0.0440	0.0429	-4,194	-3,955
400	68	42	21,933	3,144	0.0620	0.0620	0.0426	0.0439	-3,741	0.0432	0.0429	-4,294	-4,017
432	69	25	21,933	3,144	0.0619	0.0619	0.0423	0.0430	-3,866	0.0433	0.0423	-4,331	-4,099
461	67	40	21,933	3,144	0.0619	0.0617	0.0418	0.0432	-3,879	0.0427	0.0423	-4,381	-4,130
488	65	49	21,933	3,144	0.0619	0.0619	0.0429	0.0431	-3,779	0.0430	0.0422	-4,381	-4,080
523	71	60	21,933	3,144	0.0621	0.0621	0.0421	0.0373	-4,654	0.0432	0.0455	-3,994	-4,324
561	70	53	21,933	3,144	0.0622	0.0621	0.0423	0.0438	-3,829	0.0433	0.0428	-4,331	-4,080
0	0	0	0	0	0.0622	0.0622	0.0449	0.0450	-3,367	0.0467	0.0466	-3,445	-3,406

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested AMERICAN STONE - METROMIX 240

Batch Id.: Material No. 2

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Bar Reading		Specimen 1		Specimen 2				
					Initial (inches)	Final (inches)	Reading 1 (inches)	Length Change (millionths)	Reading 1 (inches)	Length Change (millionths)	Reading 2 (inches)	Length Change (millionths)	
3	71	42	0	0	0.0733	0.0734	0.0720	0.0671	0	0.0707	0.0709	0	0
3	71	42	7,700	1,104	0.0734	0.0734	0.0700	0.0671	-257	0.0700	0.0702	-192	-225
5	72	55	7,700	1,104	0.0739	0.0745	0.0709	0.0647	-652	0.0689	0.0687	-717	-685
6	73	50	7,700	1,104	0.0730	0.0730	0.0670	0.0634	-1,010	0.0667	0.0677	-826	-918
6	73	50	9,700	1,391	0.0730	0.0733	0.0677	0.0646	-797	0.0670	0.0688	-682	-740
15	73	48	9,700	1,391	0.0730	0.0729	0.0654	0.0627	-1,277	0.0650	0.0671	-1,097	-1,187
27	73	50	9,700	1,391	0.0726	0.0726	0.0641	0.0616	-1,490	0.0635	0.0652	-1,442	-1,466
27	73	50	10,967	1,572	0.0738	0.0740	0.0651	0.0629	-1,519	0.0641	0.0654	-1,654	-1,586
34	70	37	10,967	1,572	0.0724	0.0725	0.0632	0.0613	-1,600	0.0628	0.0650	-1,513	-1,556
64	74	45	10,967	1,572	0.0728	0.0727	0.0624	0.0604	-1,882	0.0614	0.0647	-1,791	-1,837
97	72	55	10,967	1,572	0.0723	0.0723	0.0618	0.0597	-1,938	0.0611	0.0634	-1,880	-1,909
134	71	50	10,967	1,572	0.0740	0.0740	0.0626	0.0610	-2,105	0.0617	0.0640	-2,160	-2,132
159	70	45	10,967	1,572	0.0707	0.0707	0.0590	0.0571	-2,217	0.0582	0.0615	-2,085	-2,151
194	70	52	10,967	1,572	0.0684	0.0685	0.0566	0.0552	-2,193	0.0559	0.0607	-1,910	-2,051
222	68	54	10,967	1,572	0.0685	0.0685	0.0567	0.0558	-2,117	0.0561	0.0598	-2,010	-2,064
259	68	55	10,967	1,572	0.0615	0.0613	0.0484	0.0462	-2,580	0.0461	0.0500	-2,710	-2,645
287	68	55	10,967	1,572	0.0612	0.0612	0.0469	0.0457	-2,780	0.0459	0.0500	-2,685	-2,732
313	72	51	10,967	1,572	0.0615	0.0615	0.0469	0.0457	-2,855	0.0460	0.0500	-2,747	-2,801
350	64	48	10,967	1,572	0.0619	0.0619	0.0468	0.0459	-2,942	0.0458	0.0498	-2,897	-2,920
377	68	37	10,967	1,572	0.0620	0.0620	0.0471	0.0454	-2,992	0.0461	0.0500	-2,860	-2,926
400	68	42	10,967	1,572	0.0620	0.0620	0.0472	0.0456	-2,955	0.0459	0.0504	-2,835	-2,895
432	69	25	10,967	1,572	0.0619	0.0619	0.0463	0.0450	-3,117	0.0455	0.0500	-2,910	-3,014
461	67	40	10,967	1,572	0.0619	0.0617	0.0465	0.0446	-3,117	0.0457	0.0499	-2,872	-2,995
488	65	49	10,967	1,572	0.0619	0.0619	0.0467	0.0455	-3,005	0.0455	0.0503	-2,872	-2,939
523	71	60	10,967	1,572	0.0621	0.0621	0.0467	0.0459	-3,005	0.0456	0.0508	-2,847	-2,926
561	70	53	10,967	1,572	0.0622	0.0621	0.0458	0.0451	-3,230	0.0458	0.0502	-2,910	-3,070
0	0	0	0	0	0.0622	0.0622	0.0489	0.0442	-2,967	0.0480	0.0513	-2,510	-2,739

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: AMERICAN STONE - METROMIX 240

Batch id.: Material No. 2

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Zero-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Specimen 1				Specimen 2						
					Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)					
3	71	42	no load	0	0.0733	0.0734	0.0708	0.0704	---	0.0742	0.0724	---	---		
3	71	42	no load	0	0.0733	0.0734	0.0708	0.0704	0	0.0742	0.0724	0	0		
5	72	55	no load	0	0.0739	0.0745	0.0701	0.0708	-262	0.0749	0.0717	-217	-240		
6	73	50	no load	0	0.0730	0.0730	0.0685	0.0693	-352	0.0734	0.0700	-330	-341		
6	73	50	no load	0	0.0730	0.0730	0.0685	0.0693	-352	0.0734	0.0700	-330	-341		
15	73	48	no load	0	0.0730	0.0729	0.0654	0.0688	-779	0.0726	0.0687	-570	-674		
27	73	50	no load	0	0.0726	0.0726	0.0640	0.0680	-962	0.0719	0.0684	-610	-786		
27	73	50	no load	0	0.0726	0.0726	0.0640	0.0680	-962	0.0719	0.0684	-610	-786		
34	70	37	no load	0	0.0724	0.0725	0.0635	0.0676	-1,040	0.0714	0.0676	-730	-885		
64	74	45	no load	0	0.0728	0.0727	0.0635	0.0675	-1,120	0.0712	0.0675	-840	-980		
97	72	55	no load	0	0.0723	0.0723	0.0624	0.0668	-1,237	0.0702	0.0665	-976	-1,107		
133	71	50	no load	0	0.0740	0.0740	0.0643	0.0682	-1,255	0.0721	0.0682	-958	-1,106		
158	70	45	no load	0	0.0707	0.0707	0.0604	0.0645	-1,380	0.0680	0.0646	-1,095	-1,237		
194	70	52	no load	0	0.0684	0.0685	0.0582	0.0624	-1,355	0.0658	0.0624	-1,083	-1,219		
222	68	54	no load	0	0.0685	0.0685	0.0581	0.0624	-1,380	0.0660	0.0624	-1,070	-1,225		
259	68	55	no load	0	0.0615	0.0613	0.0497	0.0553	-1,542	0.0586	0.0552	-1,120	-1,331		
287	68	55	no load	0	0.0612	0.0612	0.0487	0.0542	-1,755	0.0580	0.0543	-1,257	-1,506		
313	72	51	no load	0	0.0615	0.0615	0.0495	0.0549	-1,642	0.0583	0.0550	-1,207	-1,425		
350	64	48	no load	0	0.0619	0.0619	0.0491	0.0551	-1,767	0.0584	0.0551	-1,282	-1,525		
377	68	37	no load	0	0.0620	0.0620	0.0491	0.0551	-1,792	0.0583	0.0550	-1,332	-1,562		
400	68	42	no load	0	0.0620	0.0620	0.0495	0.0553	-1,717	0.0585	0.0550	-1,307	-1,512		
432	69	25	no load	0	0.0619	0.0619	0.0489	0.0549	-1,817	0.0581	0.0549	-1,345	-1,581		
461	67	40	no load	0	0.0619	0.0617	0.0491	0.0550	-1,755	0.0583	0.0549	-1,295	-1,525		
488	65	49	no load	0	0.0619	0.0619	0.0491	0.0548	-1,805	0.0585	0.0549	-1,295	-1,550		
523	71	60	no load	0	0.0621	0.0621	0.0492	0.0551	-1,805	0.0586	0.0551	-1,307	-1,556		
561	70	53	no load	0	0.0622	0.0621	0.0498	0.0555	-1,692	0.0590	0.0557	-1,195	-1,444		
0	0	0	no load	0	0.0622	0.0622	0.0489	0.0573	-1,592	0.0586	0.0563	-1,182	-1,387		

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch Id.: Material No. 3

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Reading 1		Reading 2		Length Change		Specimen 2		
					(inches)	(inches)	(inches)	(inches)	(millionths)	(inches)	(inches)	(millionths)	
3	70	45	0	0	0.0704	0.0704	0.0669	0.0664	0	0.0622	0.0639	0	0
3	70	45	8,600	1,217	0.0707	0.0706	0.0642	0.0623	-915	0.0583	0.0589	-1,176	-1,046
7	72	45	8,600	1,217	0.0710	0.0709	0.0606	0.0578	-1,995	0.0552	0.0551	-2,101	-2,048
7	72	45	12,067	1,708	0.0708	0.0708	0.0605	0.0583	-1,907	0.0545	0.0551	-2,166	-2,037
11	70	45	12,067	1,708	0.0710	0.0710	0.0582	0.0568	-2,431	0.0533	0.0541	-2,494	-2,462
18	71	50	12,067	1,708	0.0713	0.0714	0.0560	0.0551	-3,015	0.0522	0.0533	-2,819	-2,917
28	73	50	12,067	1,708	0.0731	0.0736	0.0615	0.0549	-2,854	0.0601	0.0563	-1,954	-2,404
28	73	50	18,000	2,547	0.0734	0.0733	0.0570	0.0522	-3,745	0.0535	0.0488	-3,706	-3,726
36	72	55	18,000	2,547	0.0745	0.0750	0.0568	0.0501	-4,389	0.0561	0.0428	-4,484	-4,436
46	73	48	18,000	2,547	0.0729	0.0730	0.0551	0.0466	-4,588	0.0536	0.0389	-4,835	-4,711
65	72	44	18,000	2,547	0.0725	0.0725	0.0534	0.0438	-5,019	0.0517	0.0354	-5,390	-5,204
95	74	45	18,000	2,547	0.0727	0.0726	0.0524	0.0432	-5,274	0.0516	0.0349	-5,516	-5,395
128	72	55	18,000	2,547	0.0723	0.0721	0.0512	0.0408	-5,610	0.0500	0.0324	-5,911	-5,761
164	71	50	18,000	2,547	0.0737	0.0737	0.0520	0.0430	-5,610	0.0516	0.0340	-5,884	-5,747
189	70	45	18,000	2,547	0.0706	0.0705	0.0482	0.0367	-6,085	0.0482	0.0266	-6,446	-6,266
224	70	52	18,000	2,547	0.0685	0.0685	0.0450	0.0338	-6,335	0.0457	0.0234	-6,646	-6,491
252	68	54	18,000	2,547	0.0685	0.0684	0.0442	0.0331	-6,510	0.0454	0.0232	-6,696	-6,603
290	68	55	18,000	2,547	0.0615	0.0613	0.0356	0.0231	-7,072	0.0363	0.0126	-7,396	-7,234
318	68	55	18,000	2,547	0.0611	0.0611	0.0339	0.0222	-7,323	0.0351	0.0116	-7,596	-7,459
344	72	51	18,000	2,547	0.0615	0.0615	0.0339	0.0214	-7,523	0.0354	0.0114	-7,684	-7,603
381	64	48	18,000	2,547	0.0619	0.0620	0.0340	0.0229	-7,435	0.0354	0.0112	-7,821	-7,628
408	68	37	18,000	2,547	0.0620	0.0620	0.0345	0.0220	-7,498	0.0352	0.0110	-7,884	-7,691
431	68	42	18,000	2,547	0.0620	0.0620	0.0337	0.0219	-7,610	0.0351	0.0109	-7,909	-7,759
463	69	25	18,000	2,547	0.0619	0.0619	0.0335	0.0217	-7,635	0.0349	0.0102	-7,996	-7,816
492	67	40	18,000	2,547	0.0619	0.0617	0.0329	0.0212	-7,747	0.0347	0.0100	-8,021	-7,884
519	65	49	18,000	2,547	0.0618	0.0617	0.0329	0.0214	-7,710	0.0347	0.0099	-8,021	-7,866
548	71	60	18,000	2,547	0.0621	0.0621	0.0335	0.0211	-7,760	0.0355	0.0103	-7,959	-7,859
575	70	53	18,000	2,547	0.0622	0.0622	0.0341	0.0210	-7,723	0.0358	0.0102	-7,959	-7,841
610	0	0	0	0	0.0622	0.0622	0.0350	0.0251	-7,096	0.0362	0.0138	-7,459	-7,277

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch Id.: Material No. 3

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)				
	Temp. (deg. F)	Humidity (Rel.Hum.)			Reading 1 (inches)		Reading 2 (inches)		Length Change (millionths)		Reading 1 (inches)			Reading 2 (inches)		Length Change (millionths)	
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)		Length Change (millionths)	Length Change (millionths)		
3	70	45	0	0	0.0704	0.0704	0.0663	0.0661	0	0.0602	0.0660	0	0				
3	70	45	4,300	608	0.0707	0.0706	0.0653	0.0643	-421	0.0590	0.0639	-484	-452				
7	72	45	4,300	608	0.0710	0.0709	0.0622	0.0682	-376	0.0563	0.0616	-1,169	-772				
7	72	45	6,033	854	0.0708	0.0708	0.0628	0.0626	-984	0.0562	0.0611	-1,214	-1,099				
11	70	44	6,033	854	0.0710	0.0710	0.0615	0.0610	-1,387	0.0556	0.0593	-1,565	-1,476				
18	71	50	6,033	854	0.0713	0.0714	0.0603	0.0593	-1,846	0.0544	0.0582	-1,933	-1,889				
28	73	50	6,033	854	0.0731	0.0736	0.0554	0.0617	-2,667	0.0619	0.0631	-891	-1,779				
28	73	50	9,000	1,274	0.0734	0.0733	0.0554	0.0613	-2,708	0.0647	0.0626	-600	-1,654				
36	72	55	9,000	1,274	0.0745	0.0750	0.0604	0.0603	-2,546	0.0555	0.0579	-2,690	-2,618				
46	73	48	9,000	1,274	0.0729	0.0730	0.0571	0.0580	-2,802	0.0533	0.0551	-2,859	-2,831				
65	72	44	9,000	1,274	0.0725	0.0725	0.0571	0.0570	-2,807	0.0521	0.0531	-3,137	-2,972				
95	74	45	9,000	1,274	0.0727	0.0726	0.0560	0.0552	-3,217	0.0520	0.0525	-3,275	-3,246				
128	72	55	9,000	1,274	0.0723	0.0721	0.0549	0.0539	-3,401	0.0511	0.0511	-3,454	-3,428				
164	71	50	9,000	1,274	0.0737	0.0737	0.0562	0.0552	-3,451	0.0515	0.0518	-3,686	-3,569				
189	70	45	9,000	1,274	0.0706	0.0705	0.0521	0.0527	-3,489	0.0479	0.0487	-3,736	-3,613				
224	70	52	9,000	1,274	0.0685	0.0685	0.0503	0.0500	-3,539	0.0460	0.0462	-3,774	-3,656				
252	68	54	9,000	1,274	0.0685	0.0684	0.0493	0.0497	-3,689	0.0457	0.0462	-3,744	-3,744				
290	68	55	9,000	1,274	0.0615	0.0613	0.0405	0.0405	-4,176	0.0359	0.0362	-4,511	-4,344				
318	68	55	9,000	1,274	0.0611	0.0611	0.0398	0.0408	-4,151	0.0350	0.0355	-4,636	-4,394				
344	72	51	9,000	1,274	0.0615	0.0615	0.0399	0.0400	-4,339	0.0351	0.0356	-4,711	-4,525				
381	64	48	9,000	1,274	0.0619	0.0620	0.0399	0.0392	-4,551	0.0352	0.0357	-4,799	-4,675				
408	68	37	9,000	1,274	0.0620	0.0620	0.0400	0.0405	-4,389	0.0352	0.0360	-4,774	-4,581				
431	68	42	9,000	1,274	0.0620	0.0620	0.0399	0.0394	-4,539	0.0351	0.0358	-4,811	-4,675				
463	69	25	9,000	1,274	0.0619	0.0619	0.0391	0.0393	-4,626	0.0348	0.0351	-4,911	-4,769				
492	67	40	9,000	1,274	0.0619	0.0617	0.0389	0.0399	-4,551	0.0346	0.0350	-4,924	-4,738				
519	65	49	9,000	1,274	0.0618	0.0617	0.0396	0.0399	-4,451	0.0344	0.0349	-4,949	-4,700				
554	71	60	9,000	1,274	0.0621	0.0621	0.0389	0.0390	-4,739	0.0353	0.0356	-4,836	-4,788				
592	70	53	9,000	1,274	0.0622	0.0622	0.0393	0.0393	-4,676	0.0353	0.0356	-4,861	-4,769				
0	0	0	0	0	0.0622	0.0622	0.0420	0.0418	-4,026	0.0363	0.0380	-4,436	-4,231				

Product being tested: CONPROCO - ONE SHOT
Batch Id.: Material No. 3

H10

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch Id.: Material No. 3

Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
3	70	45	0	0	0.0704	0.0704	0.0680	0.0682	0	0.0683	0.0687	0	0
3	70	45	8,600	1,216	0.0707	0.0706	0.0639	0.0620	-1,346	0.0644	0.0610	-1,267	-1,307
7	72	45	8,600	1,216	0.0710	0.0709	0.0638	0.0579	-1,944	0.0609	0.0562	-2,370	-2,157
7	72	45	12,067	1,707	0.0708	0.0708	0.0600	0.0577	-2,419	0.0613	0.0563	-2,775	-2,347
11	70	45	12,067	1,707	0.0710	0.0710	0.0591	0.0561	-2,766	0.0605	0.0550	-2,590	-2,678
18	71	50	12,067	1,707	0.0713	0.0714	0.0582	0.0550	-3,110	0.0596	0.0537	-3,033	-3,033
28	73	50	12,067	1,707	0.0731	0.0736	0.0531	0.0558	-4,154	0.0579	0.0558	-3,403	-3,778
28	73	50	18,000	2,546	0.0734	0.0733	0.0564	0.0547	-3,873	0.0609	0.0501	-3,735	-3,804
36	72	55	18,000	2,546	0.0745	0.0750	0.0501	0.0511	-5,459	0.0639	0.0436	-4,528	-4,993
46	73	48	18,000	2,546	0.0729	0.0730	0.0506	0.0483	-5,299	0.0589	0.0416	-4,946	-5,123
65	72	44	18,000	2,546	0.0725	0.0725	0.0504	0.0422	-5,955	0.0530	0.0419	-5,526	-5,741
95	74	45	18,000	2,546	0.0727	0.0726	0.0511	0.0406	-6,125	0.0508	0.0420	-5,838	-5,981
128	72	55	18,000	2,546	0.0723	0.0721	0.0490	0.0370	-6,721	0.0476	0.0404	-6,320	-6,521
164	71	50	18,000	2,546	0.0737	0.0737	0.0509	0.0372	-6,834	0.0460	0.0415	-6,760	-6,797
189	70	45	18,000	2,546	0.0706	0.0705	0.0465	0.0301	-7,484	0.0404	0.0380	-7,110	-7,297
224	70	52	18,000	2,546	0.0685	0.0685	0.0447	0.0270	-7,584	0.0367	0.0362	-7,285	-7,434
252	68	54	18,000	2,546	0.0685	0.0684	0.0444	0.0263	-7,696	0.0355	0.0360	-7,448	-7,572
290	68	55	18,000	2,546	0.0615	0.0613	0.0353	0.0156	-8,409	0.0246	0.0266	-8,223	-8,316
318	68	55	18,000	2,546	0.0611	0.0611	0.0340	0.0143	-8,659	0.0235	0.0256	-8,410	-8,534
344	72	51	18,000	2,546	0.0615	0.0615	0.0340	0.0139	-8,809	0.0231	0.0263	-8,473	-8,641
381	64	48	18,000	2,546	0.0619	0.0620	0.0339	0.0136	-8,971	0.0228	0.0255	-8,723	-8,847
408	68	37	18,000	2,546	0.0620	0.0620	0.0340	0.0134	-8,996	0.0225	0.0256	-8,760	-8,878
431	68	42	18,000	2,546	0.0620	0.0620	0.0339	0.0131	-9,046	0.0221	0.0251	-8,873	-8,959
463	69	25	18,000	2,546	0.0619	0.0619	0.0334	0.0120	-9,221	0.0214	0.0255	-8,885	-9,053
492	67	40	18,000	2,546	0.0619	0.0617	0.0332	0.0119	-9,234	0.0210	0.0247	-9,010	-9,122
519	65	49	18,000	2,546	0.0618	0.0617	0.0333	0.0123	-9,159	0.0207	0.0247	-9,035	-9,097
548	71	60	18,000	2,546	0.0621	0.0621	0.0341	0.0121	-9,171	0.0211	0.0255	-8,973	-9,072
575	70	53	18,000	2,546	0.0622	0.0622	0.0341	0.0120	-9,209	0.0210	0.0253	-9,035	-9,122
610	0	0	0	0	0.0622	0.0622	0.0352	0.0161	-8,559	0.0265	0.0260	-8,260	-8,409

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch Id.: Material No. 3

Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
3	70	45	0	0	0.0704	0.0704	0.0662	0.0677	0	0.0607	0.0663	0	0
3	70	45	4,300	608	0.0707	0.0706	0.0639	0.0659	-581	0.0580	0.0639	-695	-638
7	72	45	4,300	608	0.0710	0.0709	0.0645	0.0636	-859	0.0559	0.0622	-1,230	-1,044
7	72	45	6,033	853	0.0708	0.0708	0.0497	0.0633	-2,716	0.0560	0.0617	-1,260	-1,988
11	70	44	6,033	853	0.0710	0.0710	0.0616	0.0627	-1,352	0.0551	0.0610	-1,508	-1,430
18	71	50	6,033	853	0.0713	0.0714	0.0611	0.0622	-1,570	0.0545	0.0629	-1,435	-1,503
28	73	50	6,033	853	0.0731	0.0736	0.0554	0.0585	-3,251	0.0610	0.0626	-1,163	-2,207
28	73	50	9,000	1,273	0.0734	0.0733	0.0557	0.0586	-3,181	0.0603	0.0614	-1,390	-2,286
36	72	55	9,000	1,273	0.0745	0.0750	0.0622	0.0620	-2,301	0.0536	0.0609	-2,641	-2,471
46	73	48	9,000	1,273	0.0729	0.0730	0.0592	0.0605	-2,415	0.0524	0.0586	-2,631	-2,523
65	72	44	9,000	1,273	0.0725	0.0725	0.0587	0.0576	-2,715	0.0512	0.0570	-2,860	-2,787
95	74	45	9,000	1,273	0.0727	0.0726	0.0578	0.0567	-2,990	0.0507	0.0557	-3,133	-3,061
128	72	55	9,000	1,273	0.0723	0.0721	0.0572	0.0555	-3,101	0.0490	0.0547	-3,355	-3,228
164	71	50	9,000	1,273	0.0737	0.0737	0.0578	0.0563	-3,301	0.0490	0.0556	-3,618	-3,459
189	70	45	9,000	1,273	0.0706	0.0705	0.0528	0.0526	-3,601	0.0458	0.0519	-3,647	-3,459
224	70	52	9,000	1,273	0.0685	0.0685	0.0510	0.0502	-3,614	0.0435	0.0494	-3,780	-3,697
252	68	54	9,000	1,273	0.0685	0.0684	0.0509	0.0501	-3,626	0.0435	0.0492	-3,793	-3,709
290	68	55	9,000	1,273	0.0615	0.0613	0.0410	0.0405	-4,301	0.0336	0.0396	-4,468	-4,384
318	68	55	9,000	1,273	0.0611	0.0611	0.0400	0.0395	-4,476	0.0326	0.0383	-4,680	-4,578
344	72	51	9,000	1,273	0.0615	0.0615	0.0401	0.0399	-4,514	0.0336	0.0383	-4,655	-4,584
381	64	48	9,000	1,273	0.0619	0.0620	0.0400	0.0397	-4,664	0.0326	0.0384	-4,880	-4,772
408	68	37	9,000	1,273	0.0620	0.0620	0.0400	0.0398	-4,664	0.0324	0.0390	-4,843	-4,753
431	68	42	9,000	1,273	0.0620	0.0620	0.0409	0.0396	-4,576	0.0329	0.0387	-4,818	-4,697
463	69	25	9,000	1,273	0.0619	0.0619	0.0394	0.0388	-4,839	0.0322	0.0378	-4,993	-4,916
492	67	40	9,000	1,273	0.0619	0.0617	0.0492	0.0387	-3,601	0.0320	0.0377	-5,005	-4,903
519	65	49	9,000	1,273	0.0618	0.0617	0.0400	0.0309	-5,714	0.0323	0.0379	-4,930	-5,322
554	71	60	9,000	1,273	0.0621	0.0621	0.0399	0.0392	-4,776	0.0329	0.0380	-4,930	-4,853
592	70	53	9,000	1,273	0.0622	0.0622	0.0400	0.0393	-4,776	0.0326	0.0381	-4,980	-4,878
0	0	0	0	0	0.0622	0.0622	0.0431	0.0421	-4,039	0.0348	0.0408	-4,368	-4,203

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch id.: Material No. 3

Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Zero-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Specimen 1		Specimen 2						
					Reading 1 (inches)	Final (inches)	Reading 1 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)		
3	70	45	no load	0	0.0704	0.0704	0.0662	0.0665	---	0.0712	0.0669	---	---
3	70	45	no load	0	0.0704	0.0704	0.0662	0.0665	0	0.0712	0.0669	0	0
7	72	45	no load	0	0.0710	0.0709	0.0652	0.0649	-446	0.0649	0.0646	-1,194	-820
7	72	45	no load	0	0.0710	0.0709	0.0652	0.0649	-446	0.0649	0.0646	-1,194	-820
11	70	45	no load	0	0.0710	0.0710	0.0650	0.0650	-487	0.0660	0.0583	-1,877	-1,182
18	71	50	no load	0	0.0713	0.0714	0.0648	0.0645	-670	0.0649	0.0641	-1,375	-1,022
28	73	50	no load	0	0.0731	0.0736	0.0663	0.0705	-234	0.0663	0.0657	-1,509	-871
28	73	50	no load	0	0.0731	0.0736	0.0663	0.0705	-234	0.0663	0.0657	-1,509	-871
36	72	55	no load	0	0.0745	0.0750	0.0672	0.0670	-899	0.0672	0.0669	-1,585	-1,242
46	73	55	no load	0	0.0729	0.0730	0.0656	0.0650	-910	0.0653	0.0647	-1,645	-1,277
65	72	44	no load	0	0.0725	0.0725	0.0644	0.0636	-1,097	0.0644	0.0638	-1,750	-1,424
95	74	45	no load	0	0.0727	0.0726	0.0641	0.0634	-1,212	0.0645	0.0634	-1,836	-1,524
128	72	55	no load	0	0.0723	0.0721	0.0630	0.0623	-1,374	0.0633	0.0626	-1,971	-1,672
164	71	50	no load	0	0.0737	0.0737	0.0644	0.0640	-1,361	0.0645	0.0641	-2,009	-1,685
189	70	45	no load	0	0.0706	0.0705	0.0610	0.0607	-1,411	0.0612	0.0604	-2,096	-1,754
224	70	52	no load	0	0.0685	0.0685	0.0585	0.0583	-1,511	0.0590	0.0582	-2,134	-1,823
252	68	54	no load	0	0.0685	0.0684	0.0586	0.0582	-1,499	0.0590	0.0582	-2,121	-1,810
290	68	55	no load	0	0.0615	0.0613	0.0501	0.0500	-1,824	0.0504	0.0499	-2,471	-2,147
318	68	55	no load	0	0.0611	0.0611	0.0490	0.0486	-2,061	0.0497	0.0449	-3,115	-2,588
344	72	51	no load	0	0.0615	0.0615	0.0499	0.0493	-1,961	0.0500	0.0489	-2,671	-2,316
381	64	48	no load	0	0.0619	0.0620	0.0496	0.0493	-2,111	0.0501	0.0492	-2,734	-2,422
408	68	37	no load	0	0.0620	0.0620	0.0495	0.0493	-2,136	0.0501	0.0490	-2,771	-2,454
431	68	42	no load	0	0.0620	0.0620	0.0497	0.0496	-2,074	0.0500	0.0489	-2,796	-2,435
463	69	25	no load	0	0.0619	0.0619	0.0497	0.0492	-2,099	0.0499	0.0488	-2,796	-2,447
492	67	40	no load	0	0.0619	0.0617	0.0498	0.0495	-2,024	0.0499	0.0488	-2,759	-2,391
519	65	49	no load	0	0.0618	0.0617	0.0492	0.0489	-2,161	0.0498	0.0486	-2,796	-2,479
554	71	60	no load	0	0.0621	0.0621	0.0499	0.0499	-2,036	0.0502	0.0493	-2,746	-2,391
592	70	53	no load	0	0.0622	0.0622	0.0500	0.0498	-2,061	0.0503	0.0491	-2,784	-2,422
0	0	0	no load	0	0.0622	0.0622	0.0498	0.0492	-2,161	0.0496	0.0482	-2,984	-2,572

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: STRUCTURAL CONCRETE - FIVE STAR

Batch id.: Material No. 4

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1				Specimen 2				
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)			
3	71	42	0	0	0.0733	0.0733	0.0725	0.0716	0	0.0718	0.0714	0	0		
3	71	42	21,300	3,032	0.0730	0.0729	0.0678	0.0670	-1,076	0.0669	0.0561	-2,430	-1,753		
5	72	55	21,300	3,032	0.0750	0.0745	0.0686	0.0651	-1,665	0.0660	0.0656	-1,736	-1,736		
7	70	48	21,300	3,032	0.0746	0.0750	0.0683	0.0660	-1,605	0.0676	0.0653	-1,660	-1,633		
7	70	48	26,600	3,787	0.0741	0.0747	0.0672	0.0672	-1,497	0.0646	0.0651	-1,965	-1,731		
15	73	48	26,600	3,787	0.0730	0.0729	0.0642	0.0613	-2,245	0.0630	0.0620	-2,178	-2,211		
34	70	37	26,600	3,787	0.0725	0.0726	0.0633	0.0603	-2,371	0.0616	0.0602	-2,470	-2,421		
64	74	45	26,600	3,787	0.0726	0.0730	0.0636	0.0610	-2,317	0.0629	0.0611	-2,276	-2,297		
97	72	55	26,600	3,787	0.0721	0.0722	0.0639	0.0590	-2,365	0.0609	0.0599	-2,506	-2,436		
134	71	50	26,600	3,787	0.0738	0.0737	0.0637	0.0607	-2,578	0.0621	0.0589	-2,881	-2,729		
159	70	45	26,600	3,787	0.0705	0.0705	0.0594	0.0569	-2,777	0.0578	0.0563	-2,931	-2,854		
196	68	52	26,600	3,787	0.0690	0.0690	0.0572	0.0548	-2,940	0.0563	0.0543	-2,994	-2,967		
222	68	54	26,600	3,787	0.0686	0.0687	0.0581	0.0551	-2,702	0.0561	0.0541	-2,956	-2,829		
260	68	54	26,600	3,787	0.0613	0.0612	0.0503	0.0452	-3,065	0.0460	0.0454	-3,456	-3,261		
288	68	54	26,600	3,787	0.0613	0.0612	0.0480	0.0446	-3,427	0.0458	0.0442	-3,629	-3,528		
314	72	51	26,600	3,787	0.0615	0.0616	0.0482	0.0447	-3,465	0.0463	0.0443	-3,631	-3,548		
351	64	48	26,600	3,787	0.0620	0.0619	0.0472	0.0445	-3,715	0.0462	0.0442	-3,756	-3,736		
378	68	37	26,600	3,787	0.0620	0.0621	0.0487	0.0451	-3,477	0.0479	0.0441	-3,581	-3,529		
401	68	42	26,600	3,787	0.0620	0.0620	0.0476	0.0448	-3,640	0.0479	0.0439	-3,594	-3,617		
433	69	25	26,600	3,787	0.0619	0.0619	0.0470	0.0442	-3,765	0.0459	0.0444	-3,756	-3,761		
462	67	40	26,600	3,787	0.0617	0.0617	0.0472	0.0441	-3,702	0.0451	0.0433	-3,944	-3,823		
489	65	49	26,600	3,787	0.0617	0.0617	0.0479	0.0441	-3,615	0.0452	0.0432	-3,944	-3,779		
524	71	60	26,600	3,787	0.0621	0.0621	0.0479	0.0446	-3,652	0.0459	0.0438	-3,881	-3,767		
562	70	53	26,600	3,787	0.0622	0.0622	0.0479	0.0449	-3,640	0.0468	0.0441	-3,756	-3,698		
0	0	0	0	0	0.0622	0.0622	0.0548	0.0473	-2,477	0.0471	0.0466	-3,406	-2,942		

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: STRUCTURAL CONCRETE - FIVE STAR

Batch id.: Material No. 4

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1			Specimen 2			
							Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
3	71	42	0	0	0.0733	0.0733	0.0715	0.0715	0	0.0729	0.0712	0	0
3	71	42	10,650	1,516	0.0733	0.0733	0.0710	0.0714	-79	0.0723	0.0718	-8	-43
5	72	55	10,650	1,516	0.0750	0.0745	0.0709	0.0711	-481	0.0707	0.0715	-608	-544
7	70	48	10,650	1,516	0.0746	0.0750	0.0708	0.0697	-686	0.0700	0.0714	-714	-700
7	70	48	13,300	1,893	0.0741	0.0747	0.0750	0.0690	-155	0.0711	0.0702	-640	-398
15	73	48	13,300	1,893	0.0730	0.0729	0.0661	0.0665	-1,210	0.0674	0.0675	-1,058	-1,134
34	70	37	13,300	1,893	0.0725	0.0726	0.0653	0.0654	-1,343	0.0656	0.0669	-1,258	-1,300
64	74	45	13,300	1,893	0.0726	0.0730	0.0660	0.0665	-1,191	0.0659	0.0675	-1,216	-1,204
97	72	55	13,300	1,893	0.0721	0.0722	0.0642	0.0650	-1,441	0.0662	0.0663	-1,165	-1,303
134	71	50	13,300	1,893	0.0738	0.0737	0.0656	0.0660	-1,536	0.0651	0.0661	-1,725	-1,631
159	70	45	13,300	1,893	0.0705	0.0705	0.0614	0.0627	-1,661	0.0623	0.0638	-1,550	-1,606
196	68	52	13,300	1,893	0.0690	0.0690	0.0605	0.0608	-1,636	0.0604	0.0613	-1,725	-1,681
222	68	54	13,300	1,893	0.0686	0.0687	0.0604	0.0603	-1,624	0.0601	0.0609	-1,674	-1,674
260	68	55	13,300	1,893	0.0613	0.0612	0.0525	0.0529	-1,686	0.0543	0.0535	-1,525	-1,606
288	68	55	13,300	1,893	0.0613	0.0612	0.0515	0.0520	-1,924	0.0520	0.0536	-1,800	-1,862
314	72	51	13,300	1,893	0.0615	0.0616	0.0520	0.0524	-1,886	0.0519	0.0530	-1,963	-1,924
351	64	48	13,300	1,893	0.0620	0.0619	0.0515	0.0523	-2,061	0.0532	0.0532	-1,875	-1,968
378	68	37	13,300	1,893	0.0620	0.0621	0.0519	0.0524	-2,024	0.0529	0.0535	-1,900	-1,962
401	68	42	13,300	1,893	0.0620	0.0620	0.0510	0.0532	-2,024	0.0529	0.0540	-1,825	-1,924
433	69	25	13,300	1,893	0.0619	0.0619	0.0513	0.0518	-2,136	0.0514	0.0534	-2,063	-2,099
462	67	40	13,300	1,893	0.0617	0.0617	0.0513	0.0515	-2,124	0.0530	0.0531	-1,850	-1,987
489	65	49	13,300	1,893	0.0617	0.0617	0.0512	0.0517	-2,111	0.0519	0.0529	-2,013	-2,062
524	71	60	13,300	1,893	0.0621	0.0621	0.0521	0.0526	-1,986	0.0522	0.0539	-1,950	-1,968
562	70	53	13,300	1,893	0.0622	0.0622	0.0528	0.0525	-1,936	0.0542	0.0548	-1,613	-1,774
0	0	0	0	0	0.0622	0.0622	0.0542	0.0550	-1,449	0.0543	0.0554	-1,525	-1,487

Product being tested: STRUCTURAL CONCRETE - FIVE STAR
Batch Id.: Material No. 4

Appendix H Compressive Creep Data (ASTM C 512 (1994k))

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: W. GRACE - FASTRAK PATCH

Batch id.: Material No. 5

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Specimen 1				Specimen 2						
					Reading 1 (inches)	Final (inches)	Length Change (millionths)	Reading 2 (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)				
12	79	42	0	0	0.0719	0.0719	0.0723	0.0749	0	0.0729	0.0727	0	0		
12	79	42	19,594	2,768	0.0719	0.0719	0.0702	0.0705	-817	0.0710	0.0724	-280	-549		
20	78	41	19,594	2,768	0.0711	0.0711	0.0689	0.0685	-1,030	0.0693	0.0669	-973	-1,001		
27	71	46	19,594	2,768	0.0712	0.0710	0.0682	0.0675	-1,249	0.0678	0.0663	-1,244	-1,246		
31	70	47	19,594	2,768	0.0710	0.0711	0.0679	0.0680	-1,208	0.0677	0.0660	-1,275	-1,241		
31	70	47	27,388	3,869	0.0716	0.0712	0.0674	0.0659	-1,630	0.0674	0.0650	-1,533	-1,581		
42	70	46	27,388	3,869	0.0706	0.0704	0.0666	0.0646	-1,652	0.0661	0.0640	-1,579	-1,616		
49	70	44	27,388	3,869	0.0710	0.0710	0.0668	0.0649	-1,727	0.0669	0.0633	-1,705	-1,716		
56	71	50	27,388	3,869	0.0714	0.0715	0.0672	0.0655	-1,709	0.0670	0.0639	-1,714	-1,711		
74	72	55	27,388	3,869	0.0745	0.0733	0.0691	0.0668	-1,919	0.0696	0.0663	-1,711	-1,815		
84	73	48	27,388	3,869	0.0729	0.0729	0.0681	0.0664	-1,845	0.0682	0.0649	-1,809	-1,827		
103	70	37	27,388	3,869	0.0726	0.0725	0.0681	0.0658	-1,841	0.0682	0.0642	-1,820	-1,831		
133	74	45	27,388	3,869	0.0730	0.0728	0.0680	0.0657	-1,951	0.0683	0.0642	-1,889	-1,920		
166	72	55	27,388	3,869	0.0722	0.0724	0.0677	0.0647	-1,968	0.0679	0.0627	-2,200	-1,916		
202	71	50	27,388	3,869	0.0738	0.0738	0.0690	0.0639	-2,272	0.0691	0.0627	-2,236	-2,261		
227	70	45	27,388	3,869	0.0705	0.0705	0.0647	0.0617	-2,260	0.0644	0.0603	-2,263	-2,261		
262	68	52	27,388	3,869	0.0688	0.0688	0.0626	0.0593	-2,397	0.0623	0.0579	-2,400	-2,399		
288	68	54	27,388	3,869	0.0688	0.0689	0.0633	0.0594	-2,310	0.0631	0.0580	-2,300	-2,305		
325	68	55	27,388	3,869	0.0614	0.0612	0.0549	0.0505	-2,585	0.0546	0.0476	-2,775	-2,680		
353	68	55	27,388	3,869	0.0612	0.0611	0.0539	0.0491	-2,847	0.0533	0.0465	-3,038	-2,942		
379	72	51	27,388	3,869	0.0616	0.0615	0.0540	0.0492	-2,922	0.0538	0.0469	-3,025	-2,974		
416	64	48	27,388	3,869	0.0620	0.0619	0.0537	0.0479	-3,222	0.0536	0.0460	-3,263	-3,243		
443	68	37	27,388	3,869	0.0620	0.0620	0.0535	0.0488	-3,147	0.0532	0.0460	-3,325	-3,236		
466	68	42	27,388	3,869	0.0620	0.0620	0.0538	0.0479	-3,222	0.0536	0.0460	-3,275	-3,249		
498	69	25	27,388	3,869	0.0619	0.0619	0.0529	0.0469	-3,435	0.0528	0.0452	-3,450	-3,442		
527	67	40	27,388	3,869	0.0617	0.0617	0.0529	0.0469	-3,385	0.0527	0.0451	-3,425	-3,405		
554	65	49	27,388	3,869	0.0617	0.0616	0.0528	0.0469	-3,385	0.0522	0.0450	-3,488	-3,436		
589	71	60	27,388	3,869	0.0621	0.0621	0.0534	0.0471	-3,397	0.0529	0.0454	-3,463	-3,430		
627	70	53	27,388	3,869	0.0622	0.0621	0.0533	0.0469	-3,447	0.0530	0.0451	-3,500	-3,474		
0	0	0	0	0	0.0622	0.0622	0.0561	0.0518	-2,497	0.0561	0.0492	-2,613	-2,555		

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: W. GRACE - FASTRAK PATCH

Batch id.: Material No. 5

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Low-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1				Specimen 2				
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)			
12	79	42	0	0	0.0719	0.0719	0.0725	0.0720	0	0.0728	0.0739	0	0.0728	0.0739	0
12	79	42	9,797	1,384	0.0719	0.0719	0.0712	0.0711	-263	0.0705	0.0712	-607	0.0705	0.0712	-435
20	78	41	9,797	1,384	0.0711	0.0711	0.0700	0.0690	-485	0.0685	0.0681	-1,058	0.0685	0.0681	-771
27	71	46	9,797	1,384	0.0712	0.0710	0.0695	0.0682	-649	0.0683	0.0676	-1,146	0.0683	0.0676	-897
31	70	47	9,797	1,384	0.0710	0.0711	0.0691	0.0683	-674	0.0680	0.0674	-1,201	0.0680	0.0674	-938
31	70	47	13,694	1,934	0.0716	0.0712	0.0687	0.0679	-870	0.0681	0.0679	-1,223	0.0681	0.0679	-1,046
42	70	46	13,694	1,934	0.0706	0.0704	0.0680	0.0670	-834	0.0670	0.0669	-1,253	0.0670	0.0669	-1,043
49	70	44	13,694	1,934	0.0710	0.0710	0.0685	0.0671	-898	0.0675	0.0670	-1,305	0.0675	0.0670	-1,101
56	71	50	13,694	1,934	0.0714	0.0715	0.0689	0.0677	-869	0.0679	0.0673	-1,324	0.0679	0.0673	-1,096
74	72	55	13,694	1,934	0.0745	0.0733	0.0693	0.0694	-1,224	0.0688	0.0717	-1,272	0.0688	0.0717	-1,248
84	73	48	13,694	1,934	0.0729	0.0729	0.0701	0.0689	-934	0.0693	0.0690	-1,299	0.0693	0.0690	-1,116
103	70	37	13,694	1,934	0.0726	0.0725	0.0689	0.0683	-1,074	0.0686	0.0691	-1,285	0.0686	0.0691	-1,179
133	74	45	13,694	1,934	0.0730	0.0728	0.0696	0.0689	-999	0.0690	0.0692	-1,309	0.0690	0.0692	-1,154
166	72	55	13,694	1,934	0.0722	0.0724	0.0692	0.0686	-938	0.0689	0.0691	-1,187	0.0689	0.0691	-1,063
202	71	50	13,694	1,934	0.0739	0.0738	0.0689	0.0680	-1,435	0.0687	0.0672	-1,835	0.0687	0.0672	-1,635
227	70	45	13,694	1,934	0.0705	0.0705	0.0660	0.0655	-1,272	0.0651	0.0656	-1,460	0.0651	0.0656	-1,460
262	68	52	13,694	1,934	0.0688	0.0688	0.0637	0.0640	-1,323	0.0625	0.0636	-1,798	0.0625	0.0636	-1,560
288	68	54	13,694	1,934	0.0688	0.0689	0.0643	0.0635	-1,323	0.0634	0.0638	-1,498	0.0634	0.0638	-1,498
325	68	55	13,694	1,934	0.0612	0.0612	0.0565	0.0558	-1,373	0.0555	0.0559	-1,760	0.0555	0.0559	-1,566
353	68	55	13,694	1,934	0.0612	0.0611	0.0563	0.0559	-1,348	0.0551	0.0559	-1,772	0.0551	0.0559	-1,560
379	72	51	13,694	1,934	0.0616	0.0615	0.0564	0.0559	-1,435	0.0557	0.0560	-1,785	0.0557	0.0560	-1,610
416	64	48	13,694	1,934	0.0620	0.0619	0.0561	0.0556	-1,610	0.0549	0.0558	-1,810	0.0549	0.0558	-1,810
443	68	37	13,694	1,934	0.0620	0.0620	0.0565	0.0562	-1,498	0.0550	0.0564	-1,935	0.0550	0.0564	-1,716
466	68	42	13,694	1,934	0.0620	0.0620	0.0561	0.0558	-1,598	0.0550	0.0558	-2,010	0.0550	0.0558	-1,804
498	69	25	13,694	1,934	0.0619	0.0619	0.0559	0.0549	-1,710	0.0546	0.0552	-2,110	0.0546	0.0552	-1,910
527	67	40	13,694	1,934	0.0617	0.0617	0.0559	0.0549	-1,660	0.0548	0.0552	-2,035	0.0548	0.0552	-1,848
554	65	49	13,694	1,934	0.0617	0.0616	0.0559	0.0549	-1,648	0.0550	0.0550	-2,022	0.0550	0.0550	-1,835
589	71	60	13,694	1,934	0.0621	0.0621	0.0561	0.0556	-1,648	0.0550	0.0558	-2,035	0.0550	0.0558	-1,841
627	70	53	13,694	1,934	0.0622	0.0621	0.0554	0.0554	-1,773	0.0541	0.0559	-2,147	0.0541	0.0559	-1,960
675	0	0	0	0	0.0622	0.0622	0.0578	0.0575	-1,223	0.0564	0.0568	-1,760	0.0564	0.0568	-1,491

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: W. GRACE - FASTRAK PATCH

Batch id.: Material No. 5

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Zero-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
							Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)					
12	79	42	no load	0	0.0719	0.0719	0.0717	0.0692	0.0699	0.0863	---	0.0699	0.0863	0	---
12	79	42	no load	0	0.0719	0.0719	0.0720	0.0692	0.0699	0.0863	0	0.0699	0.0863	180	0
20	78	41	no load	0	0.0711	0.0711	0.0720	0.0684	0.0697	0.0863	129	0.0697	0.0863	154	154
27	71	46	no load	0	0.0712	0.0710	0.0708	0.0684	0.0688	0.0856	-22	0.0688	0.0856	-27	-25
31	70	47	no load	0	0.0710	0.0711	0.0702	0.0679	0.0687	0.0842	-151	0.0687	0.0842	-199	-175
31	70	47	no load	0	0.0710	0.0711	0.0702	0.0679	0.0687	0.0842	-151	0.0687	0.0842	-199	-175
42	70	46	no load	0	0.0706	0.0704	0.0697	0.0672	0.0678	0.0837	-161	0.0678	0.0837	-231	-196
49	70	44	no load	0	0.0710	0.0710	0.0694	0.0675	0.0679	0.0839	-282	0.0679	0.0839	-308	-308
56	71	50	no load	0	0.0714	0.0715	0.0701	0.0686	0.0687	0.0845	-164	0.0687	0.0845	-248	-206
74	72	55	no load	0	0.0745	0.0733	0.0721	0.0719	0.0720	0.0873	-115	0.0720	0.0873	-111	-113
84	73	48	no load	0	0.0729	0.0729	0.0717	0.0699	0.0706	0.0857	-165	0.0706	0.0857	-234	-199
103	70	37	no load	0	0.0726	0.0725	0.0715	0.0694	0.0698	0.0856	-172	0.0698	0.0856	-256	-214
133	74	45	no load	0	0.0730	0.0728	0.0720	0.0704	0.0700	0.0859	-72	0.0700	0.0859	-279	-176
166	72	55	no load	0	0.0722	0.0724	0.0710	0.0692	0.0692	0.0850	-195	0.0692	0.0850	-346	-271
202	71	50	no load	0	0.0738	0.0738	0.0725	0.0710	0.0710	0.0866	-158	0.0710	0.0866	-295	-226
227	70	45	no load	0	0.0705	0.0705	0.0689	0.0671	0.0672	0.0831	-270	0.0672	0.0831	-383	-326
262	68	52	no load	0	0.0688	0.0688	0.0670	0.0651	0.0653	0.0813	-332	0.0653	0.0813	-420	-376
288	68	54	no load	0	0.0688	0.0689	0.0669	0.0651	0.0652	0.0813	-357	0.0652	0.0813	-445	-401
325	68	55	no load	0	0.0614	0.0612	0.0597	0.0577	0.0580	0.0744	-295	0.0580	0.0744	-320	-308
353	68	55	no load	0	0.0612	0.0611	0.0593	0.0574	0.0578	0.0741	-345	0.0578	0.0741	-345	-345
379	72	51	no load	0	0.0616	0.0615	0.0596	0.0577	0.0580	0.0745	-370	0.0580	0.0745	-370	-370
416	64	48	no load	0	0.0620	0.0619	0.0599	0.0579	0.0581	0.0746	-407	0.0581	0.0746	-445	-426
443	68	37	no load	0	0.0620	0.0620	0.0598	0.0579	0.0581	0.0747	-432	0.0581	0.0747	-445	-439
466	68	42	no load	0	0.0620	0.0620	0.0599	0.0579	0.0581	0.0745	-420	0.0581	0.0745	-470	-445
498	69	25	no load	0	0.0619	0.0619	0.0594	0.0575	0.0579	0.0742	-507	0.0579	0.0742	-508	-507
527	67	40	no load	0	0.0617	0.0617	0.0593	0.0575	0.0577	0.0740	-470	0.0577	0.0740	-508	-489
554	65	49	no load	0	0.0617	0.0616	0.0592	0.0575	0.0578	0.0742	-470	0.0578	0.0742	-464	-464
589	71	60	no load	0	0.0621	0.0621	0.0599	0.0580	0.0582	0.0749	-432	0.0582	0.0749	-433	-433
627	70	53	no load	0	0.0622	0.0621	0.0601	0.0582	0.0584	0.0750	-395	0.0584	0.0750	-401	-401
0	0	0	no load	0	0.0622	0.0622	0.0599	0.0581	0.0582	0.0749	-445	0.0582	0.0749	-458	-451

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested EUCLID - EUCC SR-93
Batch id.: Material No. 6

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1		Specimen 2				
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
4	69	50	0	0	0.0723	0.0722	0.0719	0.0725	0	0.0714	0.0597	0	0
4	69	50	11,725	1,653	0.0723	0.0721	0.0690	0.0699	-687	0.0689	0.0573	-598	-642
5	73	50	11,725	1,653	0.0720	0.0720	0.0694	0.0693	-662	0.0685	0.0559	-775	-719
6	75	45	11,725	1,653	0.0721	0.0720	0.0693	0.0689	-717	0.0690	0.0557	-738	-727
7	73	50	11,725	1,653	0.0720	0.0720	0.0687	0.0688	-813	0.0700	0.0554	-653	-733
10	73	50	11,725	1,653	0.0718	0.0720	0.0659	0.0670	-1,347	0.0663	0.0540	-1,253	-1,300
19	71	45	11,725	1,653	0.0719	0.0719	0.0650	0.0664	-1,542	0.0652	0.0528	-1,550	-1,546
21	74	45	11,725	1,653	0.0720	0.0720	0.0645	0.0659	-1,690	0.0648	0.0529	-1,608	-1,649
21	74	45	16,809	2,370	0.0717	0.0720	0.0635	0.0659	-1,780	0.0642	0.0524	-1,720	-1,750
28	78	41	16,809	2,370	0.0718	0.0718	0.0625	0.0649	-2,010	0.0638	0.0519	-1,810	-1,910
28	78	41	16,809	2,370	0.0717	0.0715	0.0608	0.0642	-2,270	0.0618	0.0505	-2,183	-2,226
29	77	41	16,809	2,370	0.0710	0.0708	0.0605	0.0598	-2,680	0.0630	0.0494	-1,995	-2,337
36	74	46	16,809	2,370	0.0710	0.0709	0.0579	0.0629	-2,629	0.0590	0.0492	-2,534	-2,581
40	70	47	16,809	2,370	0.0711	0.0718	0.0586	0.0630	-2,657	0.0586	0.0489	-2,753	-2,705
40	70	47	16,809	2,370	0.0715	0.0716	0.0576	0.0633	-2,757	0.0590	0.0493	-2,673	-2,715
51	70	46	16,809	2,370	0.0704	0.0704	0.0566	0.0622	-2,744	0.0572	0.0483	-2,730	-2,737
58	70	44	16,809	2,370	0.0710	0.0708	0.0564	0.0624	-2,865	0.0572	0.0489	-2,788	-2,826
65	71	50	16,809	2,370	0.0715	0.0713	0.0560	0.0629	-2,966	0.0574	0.0490	-2,863	-2,914
83	72	55	16,809	2,370	0.0733	0.0738	0.0599	0.0649	-2,784	0.0604	0.0527	-2,569	-2,676
93	73	48	16,809	2,370	0.0729	0.0727	0.0568	0.0646	-3,016	0.0587	0.0503	-2,906	-2,961
112	70	37	16,809	2,370	0.0725	0.0725	0.0564	0.0634	-3,136	0.0582	0.0498	-2,941	-3,039
142	74	45	16,809	2,370	0.0728	0.0726	0.0559	0.0635	-3,239	0.0580	0.0501	-2,989	-3,114
175	72	55	16,809	2,370	0.0724	0.0722	0.0549	0.0624	-3,406	0.0561	0.0480	-3,394	-3,400
211	71	50	16,809	2,370	0.0739	0.0737	0.0555	0.0638	-3,527	0.0556	0.0492	-3,673	-3,600
236	70	45	16,809	2,370	0.0705	0.0705	0.0522	0.0601	-3,577	0.0538	0.0459	-3,485	-3,531
271	68	52	16,809	2,370	0.0688	0.0688	0.0498	0.0580	-3,715	0.0515	0.0434	-3,660	-3,687
296	68	54	16,809	2,370	0.0689	0.0688	0.0493	0.0586	-3,715	0.0513	0.0434	-3,697	-3,706
333	68	55	16,809	2,370	0.0613	0.0613	0.0391	0.0489	-4,315	0.0415	0.0331	-4,323	-4,319
361	68	55	16,809	2,370	0.0610	0.0611	0.0385	0.0480	-4,440	0.0408	0.0325	-4,423	-4,431
387	72	51	16,809	2,370	0.0616	0.0615	0.0389	0.0482	-4,490	0.0411	0.0329	-4,460	-4,475
424	64	48	16,809	2,370	0.0620	0.0619	0.0381	0.0480	-4,715	0.0406	0.0329	-4,623	-4,669
451	68	37	16,809	2,370	0.0620	0.0620	0.0381	0.0480	-4,727	0.0406	0.0326	-4,673	-4,700
474	68	42	16,809	2,370	0.0619	0.0620	0.0382	0.0478	-4,715	0.0405	0.0329	-4,635	-4,675
506	69	25	16,809	2,370	0.0619	0.0619	0.0376	0.0478	-4,790	0.0399	0.0338	-4,585	-4,687
535	67	40	16,809	2,370	0.0617	0.0617	0.0373	0.0477	-4,790	0.0399	0.0323	-4,723	-4,756
562	65	49	16,809	2,370	0.0616	0.0616	0.0372	0.0473	-4,827	0.0399	0.0321	-4,723	-4,775
597	71	60	16,809	2,370	0.0621	0.0620	0.0372	0.0478	-4,877	0.0400	0.0330	-4,710	-4,794
635	70	53	16,809	2,370	0.0622	0.0621	0.0374	0.0479	-4,865	0.0402	0.0324	-4,785	-4,825
0	0	0	0	0	0.0622	0.0622	0.0428	0.0522	-3,665	0.0450	0.0364	-3,698	-3,681

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested EUCLID - EUCO SR-93

Batch Id.: Material No. 6

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)	
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2				
					Initial (inches)	Final (inches)	Reading 1 (inches)	Length Change (millionths)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Length Change (millionths)		Reading 2 (inches)
4	69	50	0	0	0.0723	0.0722	0.0733	0	0.0730	0.0730	0	0.0730	0	0
4	69	50	5,863	826	0.0723	0.0721	0.0713	-407	0.0723	0.0720	-190	0.0720	-299	-299
5	73	50	5,863	827	0.0720	0.0720	0.0710	-458	0.0712	0.0737	-78	0.0737	-268	-268
6	75	45	5,863	827	0.0721	0.0720	0.0708	-412	0.0700	0.0751	-55	0.0751	-234	-234
7	73	50	5,863	827	0.0720	0.0720	0.0709	-470	0.0711	NA	-410	NA	-440	-440
10	73	50	5,863	827	0.0718	0.0720	0.0691	-870	0.0696	0.0714	-535	0.0714	-703	-703
19	71	45	5,863	827	0.0719	0.0719	0.0683	-1,000	0.0682	0.0704	-835	0.0704	-918	-918
21	74	45	5,863	827	0.0720	0.0720	0.0679	-1,173	0.0682	0.0702	-891	0.0702	-1,032	-1,032
21	74	45	8,404	1,185	0.0717	0.0720	0.0680	-1,118	0.0680	0.0704	-848	0.0704	-983	-983
28	78	41	8,404	1,185	0.0718	0.0718	0.0674	-1,237	0.0676	0.0704	-887	0.0704	-1,062	-1,062
28	78	41	13,694	1,930	0.0717	0.0715	0.0664	-1,375	0.0664	0.0699	-1,055	0.0699	-1,215	-1,215
29	77	41	13,694	1,931	0.0710	0.0708	0.0654	-1,387	0.0653	0.0688	-1,154	0.0688	-1,271	-1,271
36	74	46	13,694	1,931	0.0710	0.0709	0.0653	-1,464	0.0648	0.0681	-1,326	0.0681	-1,395	-1,395
40	70	47	13,694	1,931	0.0711	0.0718	0.0648	-1,655	0.0647	0.0686	-1,390	0.0686	-1,523	-1,523
40	70	47	13,694	1,931	0.0715	0.0716	0.0653	-1,628	0.0651	0.0677	-1,480	0.0677	-1,554	-1,554
51	70	46	13,694	1,931	0.0704	0.0704	0.0642	-1,646	0.0639	0.0668	-1,441	0.0668	-1,544	-1,544
58	70	44	13,694	1,931	0.0710	0.0708	0.0644	-1,699	0.0643	0.0666	-1,550	0.0666	-1,624	-1,624
65	71	50	13,694	1,931	0.0715	0.0713	0.0650	-1,698	0.0647	0.0680	-1,441	0.0680	-1,569	-1,569
83	72	55	13,694	1,931	0.0733	0.0738	0.0679	-1,424	0.0661	0.0705	-1,494	0.0705	-1,459	-1,459
93	73	48	13,694	1,931	0.0729	0.0727	0.0662	-1,760	0.0663	0.0680	-1,606	0.0680	-1,683	-1,683
112	70	37	13,694	1,931	0.0725	0.0725	0.0652	-1,869	0.0650	0.0682	-1,654	0.0682	-1,761	-1,761
142	74	45	13,694	1,931	0.0728	0.0726	0.0657	-1,809	0.0659	0.0680	-1,624	0.0680	-1,716	-1,716
175	72	55	13,694	1,931	0.0724	0.0722	0.0648	-1,970	0.0637	0.0688	-1,952	0.0688	-1,961	-1,961
211	71	50	13,694	1,931	0.0739	0.0737	0.0630	-2,472	0.0653	0.0678	-2,000	0.0678	-2,236	-2,236
236	70	45	13,694	1,931	0.0705	0.0705	0.0614	-2,247	0.0611	0.0646	-2,100	0.0646	-2,174	-2,174
271	68	52	13,694	1,931	0.0688	0.0688	0.0595	-2,323	0.0594	0.0623	-2,175	0.0623	-2,249	-2,249
296	68	54	13,694	1,931	0.0689	0.0688	0.0595	-2,335	0.0592	0.0623	-2,212	0.0623	-2,274	-2,274
333	68	55	13,694	1,931	0.0613	0.0613	0.0508	-2,497	0.0511	0.0549	-2,263	0.0549	-2,380	-2,380
361	68	55	13,694	1,931	0.0611	0.0611	0.0500	-2,685	0.0501	0.0539	-2,462	0.0539	-2,574	-2,574
387	72	51	13,694	1,931	0.0616	0.0615	0.0509	-2,610	0.0509	0.0545	-2,400	0.0545	-2,505	-2,505
424	64	48	13,694	1,931	0.0620	0.0619	0.0499	-2,847	0.0499	0.0544	-2,637	0.0544	-2,742	-2,742
451	68	37	13,694	1,931	0.0620	0.0620	0.0508	-2,748	0.0504	0.0545	-2,575	0.0545	-2,661	-2,661
474	68	42	13,694	1,931	0.0619	0.0620	0.0499	-2,647	0.0500	0.0550	-2,550	0.0550	-2,599	-2,599
506	69	25	13,694	1,931	0.0619	0.0619	0.0495	-2,947	0.0499	0.0539	-2,687	0.0539	-2,817	-2,817
535	67	40	13,694	1,931	0.0617	0.0617	0.0494	-2,922	0.0496	0.0539	-2,675	0.0539	-2,799	-2,799
562	65	49	13,694	1,931	0.0616	0.0616	0.0500	-2,860	0.0499	0.0550	-2,475	0.0550	-2,668	-2,668
597	71	60	13,694	1,931	0.0621	0.0620	0.0502	-2,860	0.0499	0.0547	-2,625	0.0547	-2,743	-2,743
635	70	53	13,694	1,931	0.0622	0.0621	0.0494	-2,985	0.0494	0.0549	-2,687	0.0549	-2,836	-2,836
0	0	0	0	0	0.0622	0.0622	0.0538	-2,110	0.0525	0.0564	-2,125	0.0564	-2,117	-2,117

Product being tested **EUCLID - EUCO SR-93**
Batch id.: Material No. 6

Appendix H Compressive Creep Data (ASTM C 512 (1994k))

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested CONPROCO - CONPRO-SET

Batch id.: Material No. 7

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
3	72	47	0	0	0.0712	0.0712	0.0663	0.0683	0	0.0661	0.0659	0	0
3	72	47	8,013	1,144	0.0709	0.0708	0.0638	0.0624	-960	0.0654	0.0601	-718	-839
7	73	50	8,013	1,144	0.0712	0.0711	0.0582	0.0477	-3,583	0.0565	0.0449	-3,808	-3,695
7	73	50	10,117	1,444	0.0710	0.0711	0.0559	0.0448	-4,210	0.0560	0.0430	-4,084	-4,147
9	70	44	10,117	1,444	0.0708	0.0707	0.0543	0.0404	-4,873	0.0540	0.0379	-4,895	-4,884
16	71	50	10,117	1,444	0.0713	0.0713	0.0512	0.0354	-6,020	0.0500	0.0330	-6,150	-6,085
20	73	50	10,117	1,444	0.0714	0.0713	0.0510	0.0353	-6,083	0.0520	0.0326	-5,963	-6,023
20	73	50	13,800	1,969	0.0719	0.0719	0.0505	0.0346	-6,355	0.0485	0.0320	-6,602	-6,479
28	73	50	13,800	1,969	0.0732	0.0730	0.0487	0.0311	-7,338	0.0454	0.0309	-7,440	-7,389
34	72	55	13,800	1,969	0.0738	0.0749	0.0492	0.0399	-6,476	0.0449	0.0289	-8,063	-7,269
44	73	48	13,800	1,969	0.0727	0.0730	0.0453	0.0271	-8,194	0.0423	0.0267	-8,289	-8,241
63	70	37	13,800	1,969	0.0725	0.0726	0.0434	0.0245	-8,680	0.0498	0.0242	-7,585	-8,133
93	74	45	13,800	1,969	0.0726	0.0728	0.0415	0.0218	-9,288	0.0374	0.0224	-9,396	-9,342
126	72	55	13,800	1,969	0.0722	0.0725	0.0403	0.0200	-9,579	0.0353	0.0199	-9,883	-9,731
162	71	50	13,800	1,969	0.0737	0.0737	0.0418	0.0216	-9,528	0.0371	0.0231	-9,598	-9,563
187	70	45	13,800	1,969	0.0705	0.0705	0.0357	0.0156	-10,240	0.0310	0.0161	-10,435	-10,338
222	68	52	13,800	1,969	0.0690	0.0689	0.0338	0.0136	-10,340	0.0289	0.0141	-10,560	-10,450
248	68	54	13,800	1,969	0.0686	0.0685	0.0332	0.0135	-10,328	0.0281	0.0135	-10,635	-10,481
285	68	55	13,800	1,969	0.0613	0.0612	0.0230	0.0026	-11,140	0.0176	0.0035	-11,373	-11,256
318	68	55	13,800	1,969	0.0611	0.0612	0.0226	0.0017	-11,278	0.0173	0.0027	-11,485	-11,381
344	72	51	13,800	1,969	0.0615	0.0615	0.0224	0.0015	-11,415	0.0168	0.0028	-11,623	-11,519
381	64	48	13,800	1,969	0.0619	0.0620	0.0221	0.0011	-11,615	0.0167	0.0024	-11,798	-11,706
478	68	37	13,800	1,969	0.0620	0.0620	0.0221	0.0010	-11,640	0.0165	0.0023	-11,848	-11,744
501	68	42	13,800	1,969	0.0619	0.0620	0.0221	0.0007	-11,665	0.0161	0.0021	-11,910	-11,788
533	69	25	13,800	1,969	0.0619	0.0620	0.0210	0.0004	-11,840	0.0153	0.0015	-12,085	-11,963
562	67	40	13,800	1,969	0.0617	0.0617	0.0205	0.0000	-11,890	0.0150	0.0011	-12,110	-12,000
589	65	49	13,800	1,969	0.0616	0.0616	0.0211	0.0000	-11,790	0.0154	0.0014	-11,998	-11,894
624	71	60	13,800	1,969	0.0619	0.0620	0.0210	0.0000	-11,890	0.0150	0.0019	-12,073	-11,981
662	70	53	13,800	1,969	0.0621	0.0620	0.0216	-0.0003	-11,878	0.0154	0.0010	-12,160	-12,019
0	0	0	0	0	0.0621	0.0622	0.0233	0.0025	-11,340	0.0185	0.0041	-11,410	-11,375

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested CONPROCO - CONPRO-SET

Batch id.: Material No. 7

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
3	72	47	0	0	0.0712	0.0712	0.0660	0.0650	0	0.0652	0.0663	0	0
3	72	47	4,007	572	0.0709	0.0708	0.0632	0.0632	-488	0.0629	0.0649	-380	-434
7	73	50	4,007	572	0.0712	0.0711	0.0554	0.0604	-1,883	0.0566	0.0603	-1,824	-1,853
7	73	50	5,058	722	0.0710	0.0711	0.0547	0.0602	-1,978	0.0554	0.0600	-1,983	-1,980
9	70	44	5,058	722	0.0708	0.0707	0.0549	0.0599	-1,919	0.0537	0.0589	-2,261	-2,090
16	71	50	5,058	722	0.0713	0.0713	0.0596	0.0587	-1,613	0.0553	0.0574	-2,398	-2,005
20	73	50	5,058	722	0.0714	0.0713	0.0497	0.0580	-2,965	0.0510	0.0569	-3,006	-2,986
20	73	50	6,900	985	0.0719	0.0719	0.0491	0.0580	-3,165	0.0510	0.0567	-3,156	-3,161
28	73	50	6,900	985	0.0732	0.0730	0.0482	0.0585	-3,522	0.0510	0.0563	-3,524	-3,523
34	72	55	6,900	985	0.0738	0.0749	0.0479	0.0589	-4,071	0.0493	0.0543	-4,281	-4,176
44	73	48	6,900	985	0.0727	0.0730	0.0461	0.0570	-3,918	0.0490	0.0535	-4,048	-3,983
63	70	37	6,900	985	0.0725	0.0726	0.0443	0.0558	-4,208	0.0474	0.0528	-4,255	-4,231
93	74	45	6,900	985	0.0726	0.0728	0.0430	0.0551	-4,490	0.0460	0.0517	-4,608	-4,549
126	72	55	6,900	985	0.0722	0.0725	0.0411	0.0541	-4,773	0.0470	0.0504	-4,565	-4,669
162	71	50	6,900	985	0.0737	0.0737	0.0410	0.0553	-4,968	0.0460	0.0518	-4,848	-4,908
187	70	45	6,900	985	0.0705	0.0705	0.0370	0.0507	-5,243	0.0409	0.0471	-5,272	-5,258
222	68	52	6,900	985	0.0690	0.0689	0.0350	0.0490	-5,318	0.0386	0.0450	-5,435	-5,376
248	68	54	6,900	985	0.0686	0.0685	0.0350	0.0490	-5,218	0.0390	0.0448	-5,310	-5,264
285	68	55	6,900	985	0.0613	0.0612	0.0248	0.0388	-5,943	0.0282	0.0344	-6,135	-6,039
318	68	55	6,900	985	0.0611	0.0612	0.0243	0.0382	-6,055	0.0274	0.0337	-6,297	-6,176
344	72	51	6,900	985	0.0615	0.0615	0.0232	0.0387	-6,218	0.0276	0.0344	-6,273	-6,245
381	64	48	6,900	985	0.0619	0.0620	0.0229	0.0383	-6,418	0.0279	0.0337	-6,435	-6,426
478	68	37	6,900	985	0.0620	0.0620	0.0238	0.0382	-6,330	0.0267	0.0334	-6,635	-6,483
501	68	42	6,900	985	0.0619	0.0620	0.0230	0.0382	-6,418	0.0273	0.0335	-6,535	-6,476
533	69	25	6,900	985	0.0619	0.0620	0.0213	0.0375	-6,718	0.0259	0.0327	-6,810	-6,764
562	67	40	6,900	985	0.0617	0.0617	0.0213	0.0374	-6,668	0.0259	0.0326	-6,760	-6,714
589	65	49	6,900	985	0.0616	0.0616	0.0211	0.0374	-6,668	0.0258	0.0325	-6,760	-6,714
624	71	60	6,900	985	0.0619	0.0620	0.0219	0.0379	-6,593	0.0268	0.0330	-6,660	-6,626
662	70	53	6,900	985	0.0621	0.0620	0.0209	0.0379	-6,743	0.0260	0.0330	-6,785	-6,764
0	0	0	0	0	0.0621	0.0622	0.0241	0.0389	-6,243	0.0268	0.0339	-6,597	-6,420

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested CONPROCO - CONPRO-SET

Batch id.: Material No. 7

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Zero-Stress Specimens)					
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2		
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)
3	72	47	no load	0	0.0712	0.0712	0.0663	0.0679	---	0.0689	0.0645	---
3	72	47	no load	0	0.0712	0.0712	0.0663	0.0679	0	0.0689	0.0645	0
7	73	50	no load	0	0.0712	0.0711	0.0647	0.0659	-434	0.0641	0.0633	-744
7	73	50	no load	0	0.0712	0.0711	0.0647	0.0659	-434	0.0641	0.0633	-744
9	70	44	no load	0	0.0708	0.0707	0.0643	0.0653	-458	0.0639	0.0630	-705
16	71	50	no load	0	0.0713	0.0713	0.0627	0.0642	-940	0.0623	0.0614	-1,236
20	73	50	no load	0	0.0714	0.0713	0.0624	0.0639	-1,031	0.0625	0.0613	-1,245
20	73	50	no load	0	0.0714	0.0713	0.0624	0.0639	-1,031	0.0625	0.0613	-1,245
28	73	50	no load	0	0.0732	0.0730	0.0634	0.0649	-1,212	0.0633	0.0623	-1,459
34	72	55	no load	0	0.0738	0.0749	0.0649	0.0659	-1,214	0.0675	0.0632	-1,172
44	73	48	no load	0	0.0727	0.0730	0.0622	0.0634	-1,493	0.0621	0.0610	-1,709
63	70	37	no load	0	0.0725	0.0726	0.0613	0.0626	-1,635	0.0612	0.0601	-1,865
93	74	45	no load	0	0.0726	0.0728	0.0606	0.0620	-1,821	0.0606	0.0596	-2,028
126	72	55	no load	0	0.0722	0.0725	0.0599	0.0611	-1,949	0.0600	0.0587	-2,131
162	71	50	no load	0	0.0737	0.0737	0.0610	0.0620	-2,028	0.0604	0.0593	-2,343
187	70	45	no load	0	0.0705	0.0705	0.0573	0.0587	-2,103	0.0575	0.0561	-2,305
222	68	52	no load	0	0.0690	0.0689	0.0554	0.0569	-2,178	0.0555	0.0544	-2,380
248	68	54	no load	0	0.0686	0.0685	0.0555	0.0570	-2,053	0.0556	0.0544	-2,268
285	68	55	no load	0	0.0613	0.0612	0.0461	0.0481	-2,515	0.0462	0.0451	-2,780
318	68	55	no load	0	0.0611	0.0612	0.0454	0.0471	-2,703	0.0455	0.0443	-2,943
344	72	51	no load	0	0.0615	0.0615	0.0459	0.0475	-2,677	0.0458	0.0446	-2,955
381	64	48	no load	0	0.0619	0.0620	0.0458	0.0474	-2,815	0.0457	0.0443	-3,118
478	68	37	no load	0	0.0620	0.0620	0.0457	0.0472	-2,865	0.0457	0.0443	-3,130
501	68	42	no load	0	0.0619	0.0620	0.0454	0.0471	-2,903	0.0456	0.0441	-3,155
533	69	25	no load	0	0.0619	0.0620	0.0450	0.0467	-3,003	0.0452	0.0437	-3,255
562	67	40	no load	0	0.0617	0.0617	0.0450	0.0467	-2,940	0.0452	0.0436	-3,205
589	65	49	no load	0	0.0616	0.0616	0.0450	0.0452	-3,103	0.0466	0.0437	-2,993
624	71	60	no load	0	0.0619	0.0620	0.0456	0.0471	-2,878	0.0457	0.0441	-3,143
662	70	53	no load	0	0.0621	0.0620	0.0458	0.0474	-2,840	0.0459	0.0444	-3,105
0	0	0	no load	0	0.0621	0.0622	0.0455	0.0497	-2,615	0.0457	0.0441	-3,193

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested FOSROC DN

Batch id.: Material No. 8

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1		Specimen 2				
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
3	74	47	0	0	0.0721	0.0722	0.0731	0.0734	0	0.0722	0.0722	0	0
4	74	47	7,583	1,065	0.0721	0.0721	0.0696	0.0700	-848	0.0699	0.0692	-843	-745
5	73	50	7,583	1,065	0.0723	0.0720	0.0689	0.0688	-1,090	0.0694	0.0680	-870	-980
6	73	50	7,583	1,065	0.0721	0.0720	0.0681	0.0683	-1,223	0.0685	0.0678	-975	-1,099
7	74	46	7,583	1,065	0.0721	0.0720	0.0673	0.0679	-1,378	0.0683	0.0680	-985	-1,181
8	75	45	7,583	1,065	0.0718	0.0717	0.0646	0.0653	-1,966	0.0694	0.0651	-1,119	-1,542
8	75	45	8,904	1,251	0.0717	0.0717	0.0643	0.0648	-2,055	0.0652	0.0654	-1,613	-1,834
10	79	50	8,904	1,251	0.0719	0.0720	0.0715	0.0667	-975	0.0764	0.0666	-100	-538
20	71	45	8,904	1,251	0.0719	0.0719	0.0655	0.0660	-1,810	0.0665	0.0654	-1,495	-1,653
28	78	40	8,904	1,251	0.0719	0.0716	0.0621	0.0634	-2,523	0.0638	0.0643	-1,938	-2,230
28	78	40	11,521	1,619	0.0718	0.0719	0.0614	0.0631	-2,677	0.0637	0.0640	-2,010	-2,344
29	78	41	11,521	1,619	0.0708	0.0711	0.0615	0.0624	-2,524	0.0622	0.0627	-2,135	-2,329
36	71	46	11,521	1,619	0.0715	0.0715	0.0593	0.0612	-3,086	0.0609	0.0616	-2,570	-2,828
41	70	45	11,521	1,619	0.0714	0.0709	0.0579	0.0606	-3,241	0.0596	0.0611	-2,706	-2,974
51	70	46	11,521	1,619	0.0704	0.0703	0.0565	0.0593	-3,383	0.0583	0.0608	-2,705	-3,044
58	70	44	11,521	1,619	0.0707	0.0721	0.0578	0.0603	-3,361	0.0597	0.0613	-2,731	-3,046
65	71	50	11,521	1,619	0.0713	0.0710	0.0564	0.0593	-3,589	0.0584	0.0605	-2,928	-3,258
83	72	55	11,521	1,619	0.0749	0.0740	0.0572	0.0695	-3,051	0.0600	0.0642	-3,092	-3,072
93	73	48	11,521	1,619	0.0730	0.0728	0.0570	0.0500	-5,124	0.0585	0.0623	-3,141	-4,133
112	70	37	11,521	1,619	0.0726	0.0726	0.0563	0.0591	-3,993	0.0588	0.0610	-3,185	-3,589
142	74	45	11,521	1,619	0.0728	0.0729	0.0557	0.0590	-4,148	0.0579	0.0603	-3,443	-3,795
175	72	55	11,521	1,619	0.0725	0.0723	0.0553	0.0580	-4,210	0.0570	0.0592	-3,582	-3,896
211	71	50	11,521	1,619	0.0710	0.0710	0.0529	0.0557	-4,448	0.0551	0.0569	-3,757	-4,102
236	70	45	11,521	1,619	0.0705	0.0705	0.0533	0.0550	-4,360	0.0551	0.0562	-3,720	-4,040
271	68	52	11,521	1,619	0.0687	0.0688	0.0506	0.0527	-4,549	0.0526	0.0535	-3,933	-4,241
297	68	54	11,521	1,619	0.0685	0.0686	0.0506	0.0523	-4,548	0.0523	0.0533	-3,945	-4,246
334	68	55	11,521	1,619	0.0613	0.0613	0.0402	0.0420	-5,323	0.0420	0.0439	-4,595	-4,959
362	68	55	11,521	1,619	0.0612	0.0612	0.0397	0.0421	-5,348	0.0417	0.0437	-4,632	-4,990
388	72	51	11,521	1,619	0.0616	0.0616	0.0400	0.0427	-5,335	0.0418	0.0446	-4,608	-4,971
425	64	48	11,521	1,619	0.0619	0.0621	0.0400	0.0428	-5,423	0.0419	0.0441	-4,758	-5,090
452	68	37	11,521	1,619	0.0620	0.0620	0.0398	0.0420	-5,548	0.0415	0.0433	-4,908	-5,228
475	68	42	11,521	1,619	0.0619	0.0620	0.0494	0.0417	-4,373	0.0414	0.0428	-4,970	-4,671
507	69	25	11,521	1,619	0.0620	0.0620	0.0389	0.0418	-5,685	0.0418	0.0431	-4,895	-5,290
536	67	40	11,521	1,619	0.0618	0.0618	0.0389	0.0411	-5,723	0.0410	0.0428	-4,983	-5,353
563	65	49	11,521	1,619	0.0616	0.0616	0.0386	0.0413	-5,685	0.0405	0.0422	-5,070	-5,378
598	71	60	11,521	1,619	0.0620	0.0620	0.0390	0.0418	-5,673	0.0410	0.0429	-5,020	-5,346
636	70	53	11,521	1,619	0.0620	0.0620	0.0389	0.0413	-5,748	0.0410	0.0433	-4,970	-5,359
0	0	0	0	0	0.0621	0.0621	0.0426	0.0450	-4,848	0.0426	0.0449	-4,595	-4,721

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested FOSROC DN

Batch id.: Material No. 8

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Low-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1		Specimen 2						
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)			
3	74	47	0	0	0.0721	0.0722	0.0731	0.0728	0	0.0736	0.0720	0	0		
4	74	47	3,792	533	0.0721	0.0721	0.0712	0.0719	-342	0.0709	0.0706	-515	-429		
5	73	50	3,792	533	0.0723	0.0720	0.0696	0.0701	-775	0.0710	0.0703	-550	-663		
6	73	50	3,792	533	0.0721	0.0720	0.0699	0.0699	-735	0.0704	0.0699	-645	-690		
7	74	46	3,792	533	0.0721	0.0720	0.0692	0.0694	-885	0.0702	0.0699	-675	-780		
8	75	45	3,792	533	0.0718	0.0717	0.0674	0.0675	-1,269	0.0681	0.0690	-971	-1,120		
8	75	45	4,452	626	0.0717	0.0717	0.0667	0.0676	-1,340	0.0678	0.0703	-843	-1,091		
10	79	50	4,452	626	0.0719	0.0720	0.0682	0.0752	-248	0.0694	0.0689	-870	-559		
20	71	45	4,452	626	0.0719	0.0719	0.0675	0.0675	-1,300	0.0682	0.0672	-1,225	-1,263		
28	78	40	4,452	626	0.0719	0.0716	0.0661	0.0662	-1,595	0.0672	0.0659	-1,478	-1,536		
28	78	40	5,761	809	0.0718	0.0719	0.0664	0.0662	-1,593	0.0668	0.0661	-1,525	-1,559		
29	78	41	5,761	809	0.0708	0.0711	0.0649	0.0649	-1,709	0.0658	0.0649	-1,575	-1,642		
36	71	46	5,761	809	0.0715	0.0715	0.0650	0.0652	-1,808	0.0659	0.0650	-1,685	-1,746		
41	70	45	5,761	809	0.0714	0.0709	0.0640	0.0648	-1,879	0.0649	0.0649	-1,726	-1,803		
51	70	46	5,761	809	0.0704	0.0703	0.0637	0.0631	-1,933	0.0640	0.0634	-1,830	-1,881		
58	70	44	5,761	809	0.0707	0.0721	0.0631	0.0632	-2,264	0.0665	0.0646	-1,644	-1,954		
65	71	50	5,761	809	0.0713	0.0710	0.0639	0.0633	-2,083	0.0643	0.0640	-1,918	-2,000		
83	72	55	5,761	809	0.0749	0.0740	0.0672	0.0669	-2,052	0.0688	0.0664	-1,891	-1,972		
93	73	48	5,761	809	0.0730	0.0728	0.0648	0.0652	-2,175	0.0658	0.0640	-2,164	-2,169		
112	70	37	5,761	809	0.0726	0.0726	0.0639	0.0642	159	0.0648	0.0642	-2,195	-1,018		
142	74	45	5,761	809	0.0728	0.0729	0.0640	0.0642	-2,390	0.0649	0.0690	-1,644	-2,017		
175	72	55	5,761	809	0.0725	0.0723	0.0630	0.0634	-2,500	0.0635	0.0644	-2,285	-2,392		
211	71	50	5,761	809	0.0710	0.0710	0.0611	0.0610	-2,688	0.0620	0.0610	-2,548	-2,618		
236	70	45	5,761	809	0.0705	0.0705	0.0604	0.0609	-2,663	0.0612	0.0611	-2,510	-2,586		
271	68	52	5,761	809	0.0687	0.0688	0.0590	0.0583	-2,725	0.0594	0.0584	-2,635	-2,680		
297	68	54	5,761	809	0.0685	0.0686	0.0586	0.0582	-2,738	0.0590	0.0586	-2,610	-2,674		
334	68	55	5,761	809	0.0613	0.0613	0.0491	0.0496	-3,188	0.0502	0.0502	-2,948	-3,068		
362	68	54	5,761	809	0.0612	0.0612	0.0490	0.0487	-3,288	0.0503	0.0490	-3,060	-3,174		
388	72	51	5,761	809	0.0616	0.0616	0.0489	0.0489	-3,375	0.0500	0.0495	-3,135	-3,255		
425	64	48	5,761	809	0.0619	0.0621	0.0497	0.0497	-3,275	0.0502	0.0498	-3,173	-3,224		
452	68	37	5,761	809	0.0620	0.0620	0.0484	0.0489	-3,538	0.0499	0.0490	-3,310	-3,424		
475	68	42	5,761	809	0.0619	0.0620	0.0488	0.0488	-3,488	0.0499	0.0491	-3,285	-3,386		
507	69	25	5,761	809	0.0620	0.0620	0.0483	0.0479	-3,675	0.0499	0.0489	-3,323	-3,499		
536	67	40	5,761	809	0.0618	0.0618	0.0482	0.0479	-3,638	0.0500	0.0483	-3,335	-3,486		
563	65	49	5,761	809	0.0616	0.0616	0.0477	0.0478	-3,663	0.0498	0.0480	-3,348	-3,505		
598	71	60	5,761	809	0.0620	0.0620	0.0489	0.0481	-3,575	0.0498	0.0495	-3,260	-3,418		
636	70	53	5,761	809	0.0620	0.0620	0.0482	0.0482	-3,650	0.0502	0.0488	-3,298	-3,474		
0	0	0	0	0	0.0621	0.0621	0.0506	0.0504	-3,100	0.0515	0.0502	-2,985	-3,043		

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested FOSROC DN

Batch id.: Material No. 8

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Zero-Stress Specimens)						
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
3	74	47	no load	0	0.0721	0.0722	0.0720	0.0735	0	0.0720	0.0732	0	0
4	74	47	no load	0	0.0721	0.0721	0.0720	0.0730	-43	0.0719	0.0734	17	-13
5	73	50	no load	0	0.0723	0.0720	0.0719	0.0730	-68	0.0714	0.0730	-108	-88
6	73	50	no load	0	0.0721	0.0720	0.0717	0.0729	-82	0.0713	0.0730	-90	-86
7	74	46	no load	0	0.0721	0.0720	0.0714	0.0726	-168	0.0711	0.0728	-153	-160
8	75	45	no load	0	0.0718	0.0717	0.0705	0.0711	-384	0.0699	0.0714	-396	-390
8	75	45	no load	0	0.0718	0.0717	0.0705	0.0711	-384	0.0699	0.0714	-396	-390
10	79	50	no load	0	0.0719	0.0720	0.0709	0.0720	-268	0.0704	0.0722	-273	-270
20	71	45	no load	0	0.0719	0.0719	0.0702	0.0714	-425	0.0699	0.0714	-438	-431
28	78	40	no load	0	0.0719	0.0716	0.0693	0.0711	-540	0.0699	0.0709	-458	-499
28	78	40	no load	0	0.0719	0.0716	0.0693	0.0711	-540	0.0699	0.0709	-458	-499
29	78	41	no load	0	0.0708	0.0711	0.0690	0.0699	-519	0.0681	0.0706	-444	-144
36	71	46	no load	0	0.0715	0.0715	0.0689	0.0702	-635	0.0693	0.0702	-555	-595
41	70	45	no load	0	0.0714	0.0714	0.0689	0.0700	-639	0.0681	0.0700	-711	-675
51	70	46	no load	0	0.0704	0.0703	0.0677	0.0688	-666	0.0669	0.0689	-740	-703
58	70	44	no load	0	0.0707	0.0721	0.0677	0.0690	-919	0.0669	0.0689	-1,000	-959
65	71	50	no load	0	0.0713	0.0710	0.0680	0.0695	-746	0.0674	0.0690	-859	-803
83	72	55	no load	0	0.0749	0.0740	0.0723	0.0736	-528	0.0707	0.0719	-910	-719
93	73	48	no load	0	0.0730	0.0728	0.0698	0.0708	-797	0.0690	0.0710	-848	-823
112	70	37	no load	0	0.0726	0.0726	0.0692	0.0703	-861	0.0684	0.0702	-951	-906
142	74	45	no load	0	0.0728	0.0729	0.0691	0.0701	-964	0.0681	0.0703	-1,030	-997
175	72	55	no load	0	0.0725	0.0723	0.0686	0.0697	-959	0.0676	0.0695	-1,084	-1,021
211	71	50	no load	0	0.0710	0.0710	0.0688	0.0678	-1,073	0.0660	0.0678	-1,148	-1,110
236	70	45	no load	0	0.0705	0.0705	0.0661	0.0670	-1,135	0.0652	0.0671	-1,210	-1,173
271	68	52	no load	0	0.0687	0.0688	0.0640	0.0650	-1,210	0.0631	0.0651	-1,285	-1,248
297	68	54	no load	0	0.0685	0.0686	0.0640	0.0650	-1,160	0.0631	0.0650	-1,248	-1,204
334	68	55	no load	0	0.0613	0.0613	0.0565	0.0576	-1,210	0.0559	0.0557	-1,498	-1,354
362	68	55	no load	0	0.0612	0.0612	0.0564	0.0573	-1,235	0.0554	0.0557	-1,535	-1,385
388	72	51	no load	0	0.0616	0.0616	0.0566	0.0575	-1,285	0.0559	0.0575	-1,348	-1,316
425	64	48	no load	0	0.0619	0.0621	0.0567	0.0575	-1,373	0.0558	0.0576	-1,448	-1,410
452	68	37	no load	0	0.0620	0.0620	0.0569	0.0577	-1,323	0.0559	0.0578	-1,410	-1,366
475	68	42	no load	0	0.0619	0.0620	0.0566	0.0575	-1,373	0.0559	0.0576	-1,423	-1,398
507	69	25	no load	0	0.0620	0.0620	0.0564	0.0573	-1,435	0.0557	0.0573	-1,498	-1,466
536	67	40	no load	0	0.0618	0.0618	0.0564	0.0573	-1,385	0.0555	0.0573	-1,473	-1,429
563	65	49	no load	0	0.0616	0.0616	0.0561	0.0570	-1,410	0.0555	0.0570	-1,460	-1,435
598	71	60	no load	0	0.0620	0.0620	0.0566	0.0575	-1,385	0.0558	0.0576	-1,448	-1,416
636	70	53	no load	0	0.0620	0.0620	0.0568	0.0577	-1,335	0.0560	0.0577	-1,410	-1,373
0	0	0	no load	0	0.0621	0.0621	0.0568	0.0571	0	0.0560	0.0576	-1,448	-724

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested AMERICAN STONE - MIX, INC., MIX #6

Batch id.: Material No. 9

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (High-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1				Specimen 2				
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)			
8	72	44	0	0	0.0719	0.0720	0.0710	0.0726	0	0.0703	0.0722	0	0		
8	72	44	10,631	1,517	0.0720	0.0719	0.0685	0.0720	-391	0.0681	0.0716	-355	-373		
15	78	41	10,631	1,517	0.0711	0.0711	0.0641	0.0700	-983	0.0649	0.0678	-1,011	-997		
22	73	48	10,631	1,517	0.0709	0.0709	0.0618	0.0684	-1,419	0.0624	0.0665	-1,446	-1,433		
27	70	45	10,631	1,517	0.0714	0.0710	0.0615	0.0681	-1,575	0.0616	0.0664	-1,639	-1,607		
28	69	45	10,631	1,517	0.0709	0.0713	0.0643	0.0684	-1,160	0.0609	0.0664	-1,694	-1,427		
28	69	45	13,539	1,932	0.0713	0.0711	0.0605	0.0672	-1,810	0.0608	0.0653	-1,866	-1,838		
37	70	46	13,539	1,932	0.0703	0.0710	0.0593	0.0654	-2,047	0.0598	0.0632	-2,126	-2,087		
44	70	44	13,539	1,932	0.0721	0.0719	0.0586	0.0660	-2,390	0.0603	0.0634	-2,366	-2,378		
51	71	50	13,539	1,932	0.0710	0.0711	0.0569	0.0651	-2,472	0.0582	0.0619	-2,570	-2,521		
69	72	55	13,539	1,932	0.0740	0.0749	0.0589	0.0659	-2,984	0.0629	0.0651	-2,439	-2,711		
79	73	48	13,539	1,932	0.0728	0.0726	0.0565	0.0660	-2,837	0.0588	0.0615	-2,974	-2,906		
98	73	50	13,539	1,932	0.0726	0.0727	0.0560	0.0659	-2,895	0.0581	0.0610	-3,103	-2,999		
128	74	45	13,539	1,932	0.0729	0.0727	0.0556	0.0651	-3,072	0.0580	0.0606	-3,203	-3,137		
161	72	55	13,539	1,932	0.0723	0.0722	0.0557	0.0640	-3,068	0.0568	0.0596	-3,346	-3,207		
197	71	50	13,539	1,932	0.0708	0.0710	0.0520	0.0617	-3,479	0.0548	0.0573	-3,543	-3,511		
222	70	45	13,539	1,932	0.0705	0.0705	0.0516	0.0614	-3,466	0.0543	0.0566	-3,593	-3,529		
257	68	52	13,539	1,932	0.0687	0.0688	0.0490	0.0593	-3,616	0.0518	0.0546	-3,718	-3,667		
283	68	54	13,539	1,932	0.0687	0.0687	0.0488	0.0596	-3,591	0.0515	0.0548	-3,718	-3,654		
320	68	55	13,539	1,932	0.0613	0.0612	0.0387	0.0509	-4,079	0.0415	0.0448	-4,355	-4,217		
358	68	55	13,539	1,932	0.0612	0.0612	0.0381	0.0501	-4,241	0.0411	0.0448	-4,393	-4,317		
384	72	51	13,539	1,932	0.0614	0.0615	0.0384	0.0506	-4,204	0.0423	0.0438	-4,430	-4,317		
421	64	48	13,539	1,932	0.0619	0.0619	0.0388	0.0511	-4,204	0.0419	0.0444	-4,518	-4,361		
448	68	37	13,539	1,932	0.0620	0.0620	0.0388	0.0510	-4,241	0.0414	0.0448	-4,555	-4,398		
471	68	42	13,539	1,932	0.0619	0.0620	0.0383	0.0507	-4,329	0.0414	0.0440	-4,643	-4,486		
503	69	25	13,539	1,932	0.0620	0.0619	0.0380	0.0508	-4,354	0.0418	0.0447	-4,505	-4,429		
532	67	40	13,539	1,932	0.0618	0.0618	0.0384	0.0501	-4,354	0.0419	0.0439	-4,555	-4,454		
559	65	49	13,539	1,932	0.0616	0.0616	0.0372	0.0497	-4,504	0.0413	0.0448	-4,468	-4,486		
594	71	60	13,539	1,932	0.0620	0.0620	0.0379	0.0509	-4,366	0.0418	0.0440	-4,605	-4,486		
632	70	53	13,539	1,932	0.0620	0.0620	0.0376	0.0500	-4,516	0.0422	0.0439	-4,568	-4,542		
670	0	0	0	0	0.0621	0.0621	0.0400	0.0520	-3,991	0.0462	0.0420	-4,330	-4,161		

COMPRESSIVE CREEP TEST (ASTM C 612, 3" by 6" Cylindrical Specimens)

Product being tested AMERICAN STONE - MIX, INC., MIX #6

Batch Id.: Material No. 9

Specimen Age (days)	Storage Conditions			Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)				Bar Reading		Specimen 1			Specimen 2			
							Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	
8	72	44	0	0	0.0719	0.0720	0.0713	0.0733	0	0.0716	0.0717	0	0	
8	72	44	5,316	759	0.0720	0.0719	0.0694	0.0723	-364	0.0701	0.0711	-267	-316	
15	78	41	5,316	759	0.0711	0.0711	0.0664	0.0701	-807	0.0685	0.0683	-608	-707	
22	73	48	5,316	759	0.0709	0.0709	0.0650	0.0689	-1,074	0.0664	0.0675	-916	-995	
27	70	45	5,316	759	0.0714	0.0710	0.0648	0.0691	-1,157	0.0668	0.0672	-988	-1,073	
28	69	45	5,316	759	0.0709	0.0713	0.0643	0.0693	-1,166	0.0667	0.0672	-967	-1,067	
28	69	45	6,770	966	0.0713	0.0711	0.0645	0.0688	-1,230	0.0659	0.0670	-1,118	-1,174	
37	70	46	6,770	966	0.0703	0.0710	0.0629	0.0673	-1,479	0.0649	0.0660	-1,227	-1,353	
44	70	44	6,770	966	0.0721	0.0719	0.0639	0.0689	-1,493	0.0658	0.0670	-1,327	-1,410	
51	71	50	6,770	966	0.0710	0.0711	0.0668	0.0676	-1,042	0.0648	0.0657	-1,377	-1,210	
69	72	55	6,770	966	0.0740	0.0749	0.0679	0.0709	-1,357	0.0700	0.0709	-930	-1,144	
79	73	48	6,770	966	0.0728	0.0726	0.0631	0.0689	-1,763	0.0653	0.0670	-1,565	-1,664	
98	73	50	6,770	966	0.0726	0.0727	0.0625	0.0682	-1,911	0.0652	0.0670	-1,574	-1,742	
128	74	45	6,770	966	0.0729	0.0727	0.0630	0.0686	-1,839	0.0650	0.0689	-1,391	-1,615	
161	72	55	6,770	966	0.0723	0.0722	0.0616	0.0679	-1,963	0.0632	0.0656	-1,885	-1,924	
197	71	50	6,770	966	0.0708	0.0710	0.0594	0.0657	-2,177	0.0621	0.0634	-1,967	-2,072	
222	70	45	6,770	966	0.0705	0.0705	0.0581	0.0656	-2,252	0.0611	0.0629	-2,055	-2,154	
257	68	52	6,770	966	0.0687	0.0688	0.0562	0.0637	-2,290	0.0583	0.0613	-2,168	-2,229	
283	68	54	6,770	966	0.0687	0.0687	0.0561	0.0639	-2,265	0.0586	0.0622	-2,005	-2,135	
320	68	55	6,770	966	0.0613	0.0612	0.0465	0.0560	-2,590	0.0509	0.0536	-2,180	-2,385	
358	68	55	6,770	966	0.0612	0.0612	0.0461	0.0562	-2,602	0.0487	0.0526	-2,567	-2,585	
384	72	51	6,770	966	0.0614	0.0615	0.0459	0.0563	-2,677	0.0496	0.0530	-2,468	-2,573	
421	64	48	6,770	966	0.0619	0.0619	0.0460	0.0563	-2,777	0.0489	0.0544	-2,492	-2,635	
448	68	37	6,770	966	0.0620	0.0620	0.0462	0.0570	-2,690	0.0490	0.0533	-2,642	-2,666	
471	68	42	6,770	966	0.0619	0.0620	0.0459	0.0569	-2,727	0.0496	0.0529	-2,605	-2,666	
503	69	25	6,770	966	0.0620	0.0619	0.0457	0.0564	-2,815	0.0486	0.0539	-2,605	-2,710	
532	67	40	6,770	966	0.0619	0.0618	0.0459	0.0572	-2,665	0.0489	0.0536	-2,580	-2,623	
559	65	49	6,770	966	0.0616	0.0616	0.0454	0.0568	-2,715	0.0484	0.0533	-2,618	-2,666	
594	71	60	6,770	966	0.0620	0.0620	0.0461	0.0572	-2,677	0.0489	0.0539	-2,580	-2,629	
632	70	53	6,770	966	0.0620	0.0620	0.0459	0.0576	-2,652	0.0499	0.0542	-2,417	-2,535	

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested AMERICAN STONE - MIX, INC., MIX #6

Batch Id.: Material No. 9

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Zero-Stress Specimens)					
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2		
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)
8	72	44	no load	0	0.0719	0.0720	0.0711	0.0729	---	0.0711	0.0728	---
8	72	44	no load	0	0.0719	0.0720	0.0711	0.0729	0	0.0711	0.0728	0
15	78	41	no load	0	0.0711	0.0711	0.0701	0.0712	-130	0.0701	0.0711	-137
22	73	48	no load	0	0.0709	0.0709	0.0693	0.0701	-326	0.0690	0.0702	-335
27	70	45	no load	0	0.0714	0.0710	0.0692	0.0696	-465	0.0687	0.0704	-425
28	69	45	no load	0	0.0709	0.0713	0.0688	0.0694	-524	0.0684	0.0696	-530
28	69	45	no load	0	0.0709	0.0713	0.0688	0.0694	-524	0.0684	0.0696	-527
37	70	46	no load	0	0.0703	0.0710	0.0689	0.0693	-407	0.0684	0.0694	-422
44	70	44	no load	0	0.0721	0.0719	0.0697	0.0702	-537	0.0691	0.0708	-525
51	71	50	no load	0	0.0710	0.0711	0.0689	0.0692	-506	0.0686	0.0697	-489
69	72	55	no load	0	0.0740	0.0749	0.0719	0.0729	-525	0.0729	0.0734	-426
79	73	48	no load	0	0.0728	0.0726	0.0700	0.0703	-664	0.0697	0.0706	-655
98	73	50	no load	0	0.0726	0.0727	0.0696	0.0700	-729	0.0697	0.0703	-697
128	74	45	no load	0	0.0729	0.0727	0.0696	0.0701	-756	0.0696	0.0701	-747
161	72	55	no load	0	0.0723	0.0722	0.0692	0.0694	-755	0.0690	0.0696	-747
197	71	50	no load	0	0.0708	0.0710	0.0677	0.0679	-792	0.0673	0.0679	-811
222	70	45	no load	0	0.0705	0.0705	0.0670	0.0674	-842	0.0669	0.0674	-842
257	68	52	no load	0	0.0687	0.0688	0.0650	0.0653	-918	0.0648	0.0654	-918
283	68	54	no load	0	0.0687	0.0687	0.0650	0.0654	-892	0.0648	0.0655	-892
320	68	55	no load	0	0.0613	0.0612	0.0574	0.0579	-917	0.0573	0.0580	-911
358	68	55	no load	0	0.0612	0.0612	0.0573	0.0578	-930	0.0573	0.0580	-911
384	72	51	no load	0	0.0614	0.0615	0.0575	0.0581	-930	0.0575	0.0581	-924
421	64	48	no load	0	0.0619	0.0619	0.0578	0.0581	-1,005	0.0576	0.0583	-999
448	68	37	no load	0	0.0620	0.0620	0.0578	0.0582	-1,018	0.0578	0.0585	-992
471	68	42	no load	0	0.0619	0.0620	0.0578	0.0582	-1,005	0.0577	0.0581	-1,011
503	69	25	no load	0	0.0620	0.0619	0.0576	0.0580	-1,055	0.0577	0.0581	-1,036
532	67	40	no load	0	0.0618	0.0618	0.0577	0.0581	-993	0.0579	0.0582	-967
559	65	49	no load	0	0.0616	0.0616	0.0575	0.0579	-993	0.0577	0.0580	-967
594	71	60	no load	0	0.0620	0.0620	0.0579	0.0584	-980	0.0581	0.0586	-949
629	70	53	no load	0	0.0620	0.0620	0.0580	0.0585	-955	0.0582	0.0586	-930
667	0	0	no load	0	0.0621	0.0621	0.0579	0.0583	-1,018	0.0579	0.0583	-1,011

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested AMERICAN STONE - MIX, INC., MIX #6

Batch id.: Material No. 9

Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
8	72	44	0	0	0.0719	0.0720	0.0755	0.0718	0	0.0714	0.0729	0	0
8	72	44	10,631	1,517	0.0720	0.0719	0.0726	0.0713	-439	0.0687	0.0719	-464	-451
15	78	41	10,631	1,517	0.0711	0.0711	0.0677	0.0699	-1,009	0.0637	0.0698	-1,146	-1,078
22	73	48	10,631	1,517	0.0709	0.0709	0.0662	0.0680	-1,389	0.0626	0.0682	-1,434	-1,411
27	70	45	10,631	1,517	0.0714	0.0710	0.0652	0.0684	-1,539	0.0621	0.0686	-1,523	-1,531
28	69	45	10,631	1,517	0.0709	0.0713	0.0650	0.0685	-1,520	0.0610	0.0683	-1,666	-1,593
28	69	45	13,539	1,932	0.0713	0.0711	0.0656	0.0668	-1,689	0.0614	0.0661	-1,923	-1,806
37	70	46	13,539	1,932	0.0703	0.0710	0.0624	0.0651	-2,157	0.0607	0.0641	-2,125	-2,141
44	70	44	13,539	1,932	0.0721	0.0719	0.0635	0.0655	-2,303	0.0610	0.0635	-2,496	-2,399
51	71	50	13,539	1,932	0.0710	0.0711	0.0617	0.0636	-2,526	0.0603	0.0616	-2,565	-2,546
69	72	55	13,539	1,932	0.0740	0.0749	0.0623	0.0659	-3,024	0.0629	0.0619	-3,068	-3,046
79	73	48	13,539	1,932	0.0728	0.0726	0.0621	0.0640	-2,846	0.0609	0.0618	-2,896	-2,871
98	73	50	13,539	1,932	0.0726	0.0727	0.0615	0.0633	-2,999	0.0603	0.0607	-3,086	-3,043
128	74	45	13,539	1,932	0.0729	0.0727	0.0610	0.0626	-3,180	0.0598	0.0602	-3,250	-3,215
161	72	55	13,539	1,932	0.0723	0.0722	0.0595	0.0615	-3,370	0.0585	0.0591	-3,419	-3,394
197	71	50	13,539	1,932	0.0708	0.0710	0.0570	0.0600	-3,533	0.0566	0.0520	-4,205	-3,869
222	70	45	13,539	1,932	0.0705	0.0705	0.0564	0.0597	-3,545	0.0560	0.0531	-4,043	-3,794
257	68	52	13,539	1,932	0.0687	0.0688	0.0546	0.0570	-3,670	0.0542	0.0542	-3,693	-3,681
283	68	54	13,539	1,932	0.0687	0.0687	0.0548	0.0576	-3,558	0.0543	0.0541	-3,680	-3,619
320	68	55	13,539	1,932	0.0613	0.0612	0.0451	0.0476	-4,158	0.0443	0.0442	-4,231	-4,231
358	68	55	13,539	1,932	0.0612	0.0612	0.0451	0.0475	-4,158	0.0450	0.0431	-4,343	-4,250
384	72	51	13,539	1,932	0.0614	0.0615	0.0448	0.0469	-4,333	0.0448	0.0431	-4,430	-4,381
421	64	48	13,539	1,932	0.0619	0.0619	0.0449	0.0473	-4,383	0.0449	0.0435	-4,480	-4,431
448	68	37	13,539	1,932	0.0620	0.0620	0.0444	0.0475	-4,445	0.0440	0.0436	-4,605	-4,525
471	68	42	13,539	1,932	0.0619	0.0620	0.0442	0.0472	-4,495	0.0444	0.0431	-4,605	-4,550
503	69	25	13,539	1,932	0.0620	0.0619	0.0438	0.0469	-4,583	0.0435	0.0431	-4,718	-4,650
532	67	40	13,539	1,932	0.0618	0.0618	0.0433	0.0472	-4,570	0.0435	0.0432	-4,668	-4,619
559	65	49	13,539	1,932	0.0616	0.0616	0.0438	0.0465	-4,545	0.0433	0.0421	-4,780	-4,663
594	71	60	13,539	1,932	0.0620	0.0620	0.0440	0.0469	-4,570	0.0445	0.0429	-4,630	-4,600
632	70	53	13,539	1,932	0.0620	0.0620	0.0432	0.0469	-4,670	0.0437	0.0434	-4,668	-4,669
670	0	0	0	0	0.0621	0.0621	0.0459	0.0497	-4,008	0.0458	0.0457	-4,143	-4,075

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested AMERICAN STONE - MIX, INC., MIX #6

Batch id.: Material No. 9

Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1		Specimen 2				
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
8	72	44	0	0	0.0719	0.0720	0.0700	0.0719	0	0.0716	0.0717	0	0
8	72	44	5,316	759	0.0720	0.0719	0.0681	0.0703	-445	0.0697	0.0703	-403	-424
15	78	41	5,316	759	0.0711	0.0711	0.0654	0.0688	-761	0.0666	0.0689	-759	-760
22	73	48	5,316	759	0.0709	0.0709	0.0639	0.0676	-1,049	0.0654	0.0679	-987	-1,018
27	70	45	5,316	759	0.0714	0.0710	0.0637	0.0672	-1,198	0.0654	0.0677	-1,091	-1,144
28	69	45	5,316	759	0.0709	0.0713	0.0632	0.0675	-1,192	0.0651	0.0678	-1,085	-1,139
37	69	45	6,770	966	0.0713	0.0711	0.0633	0.0670	-1,275	0.0650	0.0675	-1,171	-1,223
44	70	46	6,770	966	0.0703	0.0710	0.0617	0.0658	-1,484	0.0633	0.0659	-1,436	-1,460
51	71	50	6,770	966	0.0721	0.0719	0.0625	0.0668	-1,594	0.0643	0.0672	-1,487	-1,541
69	72	55	6,770	966	0.0740	0.0749	0.0669	0.0662	-1,735	0.0684	0.0720	-992	-1,364
79	73	48	6,770	966	0.0728	0.0726	0.0623	0.0682	-1,625	0.0637	0.0681	-1,635	-1,630
98	73	50	6,770	966	0.0726	0.0727	0.0630	0.0665	-1,735	0.0631	0.0677	-1,739	-1,737
128	74	45	6,770	966	0.0729	0.0727	0.0614	0.0665	-1,969	0.0632	0.0673	-1,805	-1,887
161	72	55	6,770	966	0.0723	0.0722	0.0606	0.0656	-2,048	0.0624	0.0665	-1,878	-1,963
197	71	50	6,770	966	0.0708	0.0710	0.0583	0.0640	-2,197	0.0600	0.0646	-2,075	-2,136
222	70	45	6,770	966	0.0705	0.0705	0.0571	0.0637	-2,285	0.0589	0.0648	-2,087	-2,186
257	68	52	6,770	966	0.0687	0.0688	0.0556	0.0618	-2,273	0.0570	0.0626	-2,162	-2,217
283	68	54	6,770	966	0.0687	0.0687	0.0553	0.0621	-2,260	0.0568	0.0628	-2,150	-2,205
320	68	55	6,770	966	0.0613	0.0612	0.0456	0.0544	-2,572	0.0473	0.0550	-2,450	-2,511
358	68	55	6,770	966	0.0612	0.0612	0.0452	0.0540	-2,660	0.0469	0.0549	-2,500	-2,580
384	72	51	6,770	966	0.0614	0.0615	0.0451	0.0545	-2,673	0.0469	0.0554	-2,500	-2,586
421	64	48	6,770	966	0.0619	0.0619	0.0455	0.0540	-2,797	0.0469	0.0550	-2,662	-2,730
448	68	37	6,770	966	0.0620	0.0620	0.0459	0.0550	-2,647	0.0469	0.0559	-2,575	-2,611
471	68	42	6,770	966	0.0619	0.0620	0.0453	0.0551	-2,697	0.0467	0.0556	-2,625	-2,661
503	69	25	6,770	966	0.0620	0.0619	0.0452	0.0541	-2,835	0.0467	0.0553	-2,662	-2,749
532	67	40	6,770	966	0.0619	0.0618	0.0453	0.0542	-2,785	0.0468	0.0549	-2,675	-2,730
559	65	49	6,770	966	0.0616	0.0616	0.0448	0.0542	-2,785	0.0460	0.0554	-2,650	-2,717
594	71	60	6,770	966	0.0620	0.0620	0.0454	0.0548	-2,735	0.0464	0.0560	-2,625	-2,680
632	70	53	6,770	966	0.0620	0.0620	0.0458	0.0549	-2,672	0.0462	0.0560	-2,650	-2,661

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested AMERICAN STONE - MIX, INC., MIX #6

Batch id.: Material No. 9 Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Zero-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
8	72	44	no load	0	0.0719	0.0720	0.0719	0.0689	---	0.0722	0.0744	---	---
8	72	44	no load	0	0.0719	0.0720	0.0719	0.0689	0	0.0722	0.0744	0	0
15	78	41	no load	0	0.0711	0.0711	0.0705	0.0676	-139	0.0704	0.0711	-421	-280
22	73	48	no load	0	0.0709	0.0709	0.0700	0.0665	-289	0.0699	0.0702	-560	-424
27	70	45	no load	0	0.0714	0.0710	0.0694	0.0666	-418	0.0697	0.0699	-696	-557
28	69	45	no load	0	0.0709	0.0713	0.0696	0.0666	-371	0.0694	0.0663	-1,154	-762
28	69	45	no load	0	0.0709	0.0713	0.0696	0.0666	-371	0.0694	0.0663	-1,154	-762
37	70	46	no load	0	0.0703	0.0710	0.0692	0.0667	-291	0.0698	0.0696	-581	-436
44	70	44	no load	0	0.0721	0.0719	0.0699	0.0670	-504	0.0702	0.0706	-740	-622
51	71	50	no load	0	0.0710	0.0711	0.0699	0.0665	-320	0.0691	0.0697	-749	-534
69	72	55	no load	0	0.0740	0.0749	0.0723	0.0681	-695	0.0723	0.0729	-799	-747
79	73	48	no load	0	0.0728	0.0726	0.0705	0.0674	-563	0.0708	0.0710	-792	-677
98	73	50	no load	0	0.0726	0.0727	0.0702	0.0668	-660	0.0703	0.0705	-900	-780
128	74	45	no load	0	0.0729	0.0727	0.0699	0.0670	-704	0.0702	0.0704	-962	-833
161	72	55	no load	0	0.0723	0.0722	0.0698	0.0663	-670	0.0694	0.0700	-975	-823
197	71	50	no load	0	0.0708	0.0710	0.0680	0.0646	-770	0.0684	0.0682	-987	-879
222	70	45	no load	0	0.0705	0.0705	0.0672	0.0640	-845	0.0674	0.0676	-1,087	-966
257	68	52	no load	0	0.0687	0.0688	0.0653	0.0621	-883	0.0653	0.0656	-1,162	-1,022
283	68	54	no load	0	0.0687	0.0687	0.0652	0.0621	-883	0.0653	0.0654	-1,175	-1,029
320	68	55	no load	0	0.0613	0.0612	0.0579	0.0547	-858	0.0579	0.0582	-1,137	-997
358	68	55	no load	0	0.0612	0.0612	0.0576	0.0543	-933	0.0576	0.0581	-1,175	-1,054
384	72	51	no load	0	0.0614	0.0615	0.0578	0.0548	-908	0.0580	0.0583	-1,162	-1,035
421	64	48	no load	0	0.0619	0.0619	0.0579	0.0546	-1,033	0.0579	0.0582	-1,300	-1,166
448	68	37	no load	0	0.0620	0.0620	0.0591	0.0549	-870	0.0582	0.0585	-1,250	-1,060
471	68	42	no load	0	0.0619	0.0620	0.0579	0.0550	-995	0.0582	0.0586	-1,225	-1,110
503	69	25	no load	0	0.0620	0.0619	0.0580	0.0549	-995	0.0581	0.0584	-1,262	-1,129
532	67	40	no load	0	0.0618	0.0618	0.0580	0.0549	-958	0.0581	0.0584	-1,225	-1,091
559	65	49	no load	0	0.0616	0.0616	0.0579	0.0544	-983	0.0579	0.0581	-1,237	-1,110
594	71	60	no load	0	0.0620	0.0620	0.0583	0.0550	-958	0.0584	0.0588	-1,187	-1,072
629	70	53	no load	0	0.0620	0.0620	0.0583	0.0556	-883	0.0585	0.0589	-1,162	-1,022
667	0	0	no load	0	0.0621	0.0621	0.0586	0.0550	-945	0.0583	0.0597	-1,112	-1,029

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested MASTER BUILDERS - EMACO R 310

Batch id.: Material No. 10

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					(inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
5	71	38	0	0	0.0707	0.0709	0.0670	0.0676	0	0.0664	0.0670	0	0
5	71	38	10,848	1,535	0.0710	0.0709	0.0621	0.0571	-1,965	0.0618	0.0634	-1,075	-1,520
7	73	50	10,848	1,535	0.0711	0.0710	0.0584	0.0610	-1,970	0.0576	0.0584	-2,240	-2,105
7	73	50	10,700	1,514	0.0711	0.0710	0.0568	0.0608	-2,190	0.0579	0.0587	-2,167	-2,179
16	71	50	10,700	1,514	0.0711	0.0713	0.0535	0.0588	-2,898	0.0522	0.0550	-3,382	-3,140
28	73	50	10,700	1,514	0.0730	0.0730	0.0541	0.0592	-3,224	0.0524	0.0551	-3,806	-3,515
28	73	50	14,300	2,024	0.0731	0.0729	0.0539	0.0583	-3,366	0.0527	0.0551	-3,762	-3,584
34	72	55	14,300	2,024	0.0749	0.0768	0.0598	0.0563	-3,582	0.0506	0.0560	-4,625	-4,104
44	73	48	14,300	2,024	0.0726	0.0726	0.0503	0.0562	-3,971	0.0481	0.0530	-4,496	-4,234
63	73	50	14,300	2,024	0.0727	0.0730	0.0491	0.0557	-4,249	0.0471	0.0520	-4,811	-4,530
93	74	45	14,300	2,024	0.0727	0.0726	0.0480	0.0549	-4,443	0.0460	0.0508	-5,051	-4,747
126	72	55	14,300	2,024	0.0722	0.0722	0.0463	0.0534	-4,723	0.0446	0.0488	-5,362	-5,042
162	71	50	14,300	2,024	0.0711	0.0710	0.0442	0.0511	-4,983	0.0417	0.0467	-5,697	-5,340
187	70	45	14,300	2,024	0.0705	0.0705	0.0435	0.0503	-5,032	0.0413	0.0460	-5,697	-5,365
224	68	52	14,300	2,024	0.0688	0.0688	0.0409	0.0482	-5,195	0.0439	0.0353	-6,285	-5,740
250	68	54	14,300	2,024	0.0687	0.0688	0.0415	0.0487	-5,045	0.0494	0.0442	-4,472	-4,759
287	68	55	14,300	2,024	0.0614	0.0612	0.0305	0.0381	-5,883	0.0380	0.0338	-5,335	-5,609
315	68	55	14,300	2,024	0.0612	0.0612	0.0303	0.0377	-5,932	0.0384	0.0332	-5,335	-5,634
341	72	51	14,300	2,024	0.0615	0.0615	0.0299	0.0378	-6,045	0.0276	0.0332	-6,760	-6,402
378	64	48	14,300	2,024	0.0619	0.0619	0.0296	0.0374	-6,232	0.0274	0.0329	-6,922	-6,577
405	68	37	14,300	2,024	0.0620	0.0620	0.0291	0.0374	-6,320	0.0270	0.0329	-6,997	-6,659
428	68	42	14,300	2,024	0.0619	0.0620	0.0294	0.0375	-6,257	0.0273	0.0329	-6,947	-6,602
460	69	25	14,300	2,024	0.0620	0.0619	0.0288	0.0372	-6,370	0.0268	0.0325	-7,060	-6,715
489	67	40	14,300	2,024	0.0618	0.0619	0.0290	0.0372	-6,320	0.0268	0.0324	-7,047	-6,684
516	65	49	14,300	2,024	0.0616	0.0616	0.0289	0.0370	-6,295	0.0265	0.0322	-7,047	-6,671
551	71	60	14,300	2,024	0.0620	0.0620	0.0292	0.0375	-6,295	0.0269	0.0327	-7,035	-6,665
589	70	53	14,300	2,024	0.0620	0.0620	0.0299	0.0374	-6,220	0.0269	0.0327	-7,035	-6,627
0	0	0	0	0	0.0621	0.0621	0.0352	0.0381	-5,495	0.0261	0.0360	-6,747	-6,121

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested MASTER BUILDERS - EMACO R 310

Batch id.: Material No. 10

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)				
	Temp. (deg. F)	Humidity (Rel. Hum.)			Reading 1		Reading 2		Length Change		Reading 1			Reading 2		Length Change	
					(inches)	(inches)	(inches)	(inches)	(millionths)	(millionths)	(inches)	(inches)		(inches)	(inches)	(millionths)	(millionths)
5	71	38	0	0	0.0707	0.0709	0.0606	0.0652	0	0.0599	0.0659	0	0				
5	71	38	5,424	768	0.0710	0.0709	0.0601	0.0652	-107	0.0601	0.0660	-125	-116				
7	73	50	5,424	768	0.0711	0.0710	0.0586	0.0660	-232	0.0599	0.0660	-185	-209				
7	73	50	5,350	757	0.0711	0.0710	0.0597	0.0655	-151	0.0611	0.0660	-23	-87				
16	71	50	5,350	757	0.0711	0.0713	0.0572	0.0659	-455	0.0631	0.0653	90	-182				
28	73	50	5,350	757	0.0730	0.0730	0.0583	0.0673	-600	0.0589	0.0659	-807	-704				
28	73	50	7,150	1,012	0.0731	0.0729	0.0585	0.0667	-644	0.0587	0.0661	-806	-725				
34	72	55	7,150	1,012	0.0749	0.0768	0.0559	0.0654	-1,842	0.0557	0.0659	-1,926	-1,884				
44	73	48	7,150	1,012	0.0726	0.0726	0.0555	0.0650	-1,128	0.0565	0.0649	-1,133	-1,130				
63	73	50	7,150	1,012	0.0727	0.0730	0.0543	0.0650	-1,339	0.0548	0.0645	-1,460	-1,399				
93	74	45	7,150	1,012	0.0727	0.0726	0.0536	0.0641	-1,490	0.0547	0.0661	-1,223	-1,356				
126	72	55	7,150	1,012	0.0722	0.0722	0.0521	0.0631	-1,690	0.0529	0.0579	-2,361	-2,026				
162	71	50	7,150	1,012	0.0711	0.0710	0.0493	0.0610	-2,015	0.0509	0.0603	-2,018	-2,016				
187	70	45	7,150	1,012	0.0705	0.0705	0.0482	0.0600	-2,140	0.0500	0.0594	-2,105	-2,122				
224	68	52	7,150	1,012	0.0688	0.0688	0.0464	0.0580	-2,190	0.0478	0.0572	-2,230	-2,210				
250	68	54	7,150	1,012	0.0687	0.0688	0.0461	0.0579	-2,227	0.0476	0.0570	-2,268	-2,247				
287	68	55	7,150	1,012	0.0614	0.0612	0.0354	0.0486	-2,865	0.0369	0.0475	-2,930	-2,897				
315	68	55	7,150	1,012	0.0612	0.0612	0.0352	0.0482	-2,915	0.0364	0.0469	-3,043	-2,979				
341	72	51	7,150	1,012	0.0615	0.0615	0.0353	0.0485	-2,940	0.0368	0.0470	-3,055	-2,997				
378	64	48	7,150	1,012	0.0619	0.0619	0.0345	0.0478	-3,227	0.0361	0.0465	-3,305	-3,266				
405	68	37	7,150	1,012	0.0620	0.0620	0.0350	0.0483	-3,127	0.0362	0.0467	-3,293	-3,210				
428	68	42	7,150	1,012	0.0619	0.0620	0.0348	0.0481	-3,165	0.0361	0.0461	-3,368	-3,266				
460	69	25	7,150	1,012	0.0620	0.0619	0.0340	0.0477	-3,315	0.0355	0.0460	-3,455	-3,385				
489	67	40	7,150	1,012	0.0618	0.0619	0.0334	0.0478	-3,352	0.0357	0.0460	-3,405	-3,379				
516	65	49	7,150	1,012	0.0616	0.0616	0.0344	0.0474	-3,215	0.0353	0.0459	-3,405	-3,310				
551	71	60	7,150	1,012	0.0620	0.0620	0.0349	0.0479	-3,190	0.0359	0.0462	-3,392	-3,291				
589	70	53	7,150	1,012	0.0620	0.0620	0.0341	0.0481	-3,265	0.0355	0.0461	-3,455	-3,360				
0	0	0	0	0	0.0621	0.0621	0.0000	0.0000	-13,565	0.0000	0.0000	-13,680	-13,623				

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested MASTER BUILDERS - EMACO R 310

Batch id.: Material No. 10

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Zero-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Specimen 1		Specimen 2								
					Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)					
5	71	38	no load	0	0.0707	0.0709	0.0657	0.0669	---	0.0668	0.0617	---	---		
5	71	38	no load	0	0.0707	0.0709	0.0657	0.0669	0	0.0668	0.0617	0	0		
7	73	50	no load	0	0.0711	0.0710	0.0664	0.0677	118	0.0663	0.0608	-242	-62		
7	73	50	no load	0	0.0711	0.0710	0.0664	0.0677	118	0.0663	0.0608	-242	-62		
16	71	50	no load	0	0.0711	0.0713	0.0666	0.0667	-16	0.0663	0.0609	-275	-146		
28	73	50	no load	0	0.0730	0.0730	0.0672	0.0677	-274	0.0679	0.0624	-342	-308		
28	73	50	no load	0	0.0730	0.0730	0.0672	0.0677	-274	0.0679	0.0624	-342	-308		
34	72	55	no load	0	0.0749	0.0768	0.0704	0.0712	-147	0.0717	0.0750	999	426		
44	73	48	no load	0	0.0726	0.0726	0.0662	0.0671	-366	0.0671	0.0618	-403	-384		
63	73	50	no load	0	0.0727	0.0730	0.0656	0.0667	-569	0.0667	0.0614	-582	-576		
93	74	45	no load	0	0.0727	0.0726	0.0654	0.0662	-604	0.0662	0.0610	-641	-623		
126	72	55	no load	0	0.0722	0.0722	0.0645	0.0651	-740	0.0652	0.0600	-776	-758		
162	71	50	no load	0	0.0711	0.0710	0.0626	0.0640	-823	0.0638	0.0584	-864	-843		
187	70	45	no load	0	0.0705	0.0705	0.0619	0.0632	-872	0.0628	0.0576	-951	-912		
222	68	52	no load	0	0.0688	0.0688	0.0598	0.0610	-985	0.0605	0.0558	-1,039	-1,012		
250	68	54	no load	0	0.0687	0.0688	0.0595	0.0609	-1,022	0.0604	0.0557	-1,051	-1,037		
287	68	55	no load	0	0.0614	0.0612	0.0521	0.0534	-1,022	0.0543	0.0461	-1,151	-1,087		
315	68	55	no load	0	0.0612	0.0612	0.0503	0.0521	-1,385	0.0518	0.0458	-1,476	-1,431		
341	72	51	no load	0	0.0615	0.0615	0.0505	0.0524	-1,397	0.0520	0.0460	-1,501	-1,449		
378	64	48	no load	0	0.0619	0.0619	0.0506	0.0522	-1,510	0.0521	0.0461	-1,576	-1,543		
405	68	37	no load	0	0.0620	0.0620	0.0507	0.0521	-1,535	0.0522	0.0460	-1,601	-1,568		
428	68	42	no load	0	0.0619	0.0620	0.0505	0.0526	-1,485	0.0520	0.0460	-1,614	-1,549		
460	69	25	no load	0	0.0620	0.0619	0.0504	0.0527	-1,485	0.0519	0.0459	-1,639	-1,562		
489	67	40	no load	0	0.0618	0.0619	0.0503	0.0524	-1,510	0.0517	0.0459	-1,639	-1,574		
516	65	49	no load	0	0.0616	0.0616	0.0500	0.0519	-1,547	0.0514	0.0455	-1,664	-1,606		
551	71	60	no load	0	0.0620	0.0620	0.0508	0.0526	-1,460	0.0515	0.0459	-1,701	-1,581		
589	70	53	no load	0	0.0620	0.0620	0.0508	0.0529	-1,422	0.0521	0.0460	-1,614	-1,518		
0	0	0	no load	0	0.0621	0.0621	0.0500	0.0521	-1,647	0.0555	0.0457	-1,251	-1,449		

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested MASTER BUILDERS - EMACOR 310

Batch id.: Material No. 10

Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1			Specimen 2			
							Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
5	71	38	0	0	0.0707	0.0709	0.0696	0.0665	0	0.0650	0.0671	0	0
5	71	38	10,848	1,535	0.0710	0.0709	0.0647	0.0639	-991	0.0600	0.0648	-955	-973
7	73	50	10,848	1,535	0.0711	0.0710	0.0581	0.0608	-2,216	0.0549	0.0602	-2,196	-2,206
7	73	50	10,700	1,514	0.0711	0.0710	0.0601	0.0603	-2,037	0.0548	0.0600	-2,234	-2,136
9	70	44	10,700	1,514	0.0719	0.0721	0.0593	0.0603	-2,376	0.0533	0.0574	-2,985	-2,681
16	71	50	10,700	1,514	0.0711	0.0713	0.0545	0.0589	-2,955	0.0507	0.0532	-3,640	-3,297
28	73	50	10,700	1,514	0.0730	0.0730	0.0548	0.0586	-3,399	0.0512	0.0571	-3,546	-3,472
28	73	50	14,300	2,024	0.0731	0.0729	0.0539	0.0582	-3,569	0.0502	0.0549	-3,940	-3,754
34	72	55	14,300	2,024	0.0749	0.0768	0.0515	0.0609	-4,241	0.0494	0.0545	-4,802	-4,522
44	73	48	14,300	2,024	0.0726	0.0726	0.0468	0.0570	-4,498	0.0450	0.0502	-5,071	-4,784
63	73	50	14,300	2,024	0.0727	0.0730	0.0455	0.0553	-4,940	0.0435	0.0482	-5,577	-5,259
93	74	45	14,300	2,024	0.0727	0.0726	0.0433	0.0542	-5,305	0.0408	0.0477	-5,922	-5,614
126	72	55	14,300	2,024	0.0722	0.0722	0.0414	0.0518	-5,726	0.0409	0.0456	-6,069	-5,897
162	71	50	14,300	2,024	0.0711	0.0710	0.0402	0.0598	-4,589	0.0363	0.0433	-6,637	-5,613
187	70	45	14,300	2,024	0.0705	0.0705	0.0375	0.0485	-6,201	0.0348	0.0420	-6,850	-6,526
224	68	52	14,300	2,024	0.0688	0.0688	0.0353	0.0462	-6,339	0.0328	0.0402	-6,900	-6,619
250	68	54	14,300	2,024	0.0687	0.0688	0.0360	0.0465	-6,201	0.0333	0.0403	-6,812	-6,507
287	68	55	14,300	2,024	0.0614	0.0612	0.0255	0.0357	-7,001	0.0218	0.0387	-6,587	-6,794
315	68	55	14,300	2,024	0.0612	0.0612	0.0250	0.0351	-7,114	0.0210	0.0285	-7,937	-7,526
341	72	51	14,300	2,024	0.0615	0.0615	0.0251	0.0351	-7,176	0.0215	0.0289	-7,900	-7,538
378	64	48	14,300	2,024	0.0619	0.0619	0.0238	0.0352	-7,426	0.0222	0.0279	-8,036	-7,731
405	68	37	14,300	2,024	0.0620	0.0620	0.0239	0.0350	-7,464	0.0210	0.0280	-8,200	-7,832
428	68	42	14,300	2,024	0.0619	0.0620	0.0238	0.0352	-7,439	0.0210	0.0279	-8,200	-7,819
460	69	25	14,300	2,024	0.0620	0.0619	0.0232	0.0347	-7,576	0.0208	0.0279	-8,225	-7,901
489	67	40	14,300	2,024	0.0618	0.0619	0.0232	0.0346	-7,564	0.0215	0.0273	-8,187	-7,876
516	65	49	14,300	2,024	0.0616	0.0616	0.0229	0.0343	-7,576	0.0210	0.0279	-8,112	-7,844
551	71	60	14,300	2,024	0.0620	0.0620	0.0234	0.0346	-7,576	0.0219	0.0278	-8,112	-7,844
589	70	53	14,300	2,024	0.0620	0.0620	0.0235	0.0346	-7,564	0.0207	0.0275	-8,300	-7,932
0	0	0	0	0	0.0621	0.0621	0.0249	0.0353	-7,326	0.0222	0.0291	-7,937	-7,632

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested MASTER BUILDERS - EMACO R 310

Batch Id.: Material No. 10 Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Specimen 1		Specimen 2						
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
5	71	38	0	0	0.0707	0.0709	0.0766	0.0654	0	0.0632	0.0645	0	0
5	71	38	5,424	768	0.0710	0.0709	0.0764	0.0652	-95	0.0634	0.0646	-5	-50
7	73	50	5,424	768	0.0711	0.0710	0.0764	0.0659	-32	0.0640	0.0630	-156	-94
7	73	50	5,350	757	0.0711	0.0710	0.0775	0.0653	26	0.0644	0.0640	15	21
9	70	44	5,350	757	0.0719	0.0721	0.0774	0.0664	-82	0.0630	0.0638	-419	-251
16	71	50	5,350	757	0.0711	0.0713	0.0733	0.0652	-547	0.0622	0.0619	-557	-552
28	73	50	5,350	757	0.0730	0.0730	0.0746	0.0656	-785	0.0627	0.0620	-937	-861
28	73	50	7,150	1,012	0.0731	0.0729	0.0741	0.0657	-846	0.0621	0.0628	-914	-880
34	72	55	7,150	1,012	0.0749	0.0768	0.0758	0.0691	-911	0.0632	0.0651	-1,200	-1,056
44	73	48	7,150	1,012	0.0726	0.0726	0.0724	0.0637	-1,194	0.0591	0.0600	-1,530	-1,362
63	73	50	7,150	1,012	0.0727	0.0730	0.0720	0.0633	-1,368	0.0697	0.0618	-51	-709
93	74	45	7,150	1,012	0.0727	0.0726	0.0710	0.0621	-1,590	0.0591	0.0587	-1,711	-1,651
126	72	55	7,150	1,012	0.0722	0.0722	0.0693	0.0620	-1,700	0.0583	0.0576	-1,835	-1,768
162	71	50	7,150	1,012	0.0711	0.0710	0.0671	0.0594	-2,013	0.0559	0.0557	-2,085	-2,049
187	70	45	7,150	1,012	0.0705	0.0705	0.0660	0.0586	-2,112	0.0555	0.0550	-2,085	-2,099
224	68	52	7,150	1,012	0.0688	0.0688	0.0642	0.0567	-2,150	0.0530	0.0531	-2,210	-2,180
250	68	54	7,150	1,012	0.0687	0.0688	0.0640	0.0570	-2,125	0.0529	0.0529	-2,235	-2,180
287	68	55	7,150	1,012	0.0614	0.0612	0.0565	0.0469	-2,463	0.0425	0.0430	-2,910	-2,686
315	68	55	7,150	1,012	0.0612	0.0612	0.0562	0.0468	-2,487	0.0434	0.0429	-2,785	-2,636
341	72	51	7,150	1,012	0.0615	0.0615	0.0564	0.0470	-2,513	0.0433	0.0424	-2,935	-2,724
378	64	48	7,150	1,012	0.0619	0.0619	0.0560	0.0463	-2,750	0.0422	0.0422	-3,197	-2,974
405	68	37	7,150	1,012	0.0620	0.0620	0.0561	0.0470	-2,675	0.0420	0.0435	-3,085	-2,880
428	68	42	7,150	1,012	0.0619	0.0620	0.0561	0.0467	-2,700	0.0421	0.0433	-3,085	-2,892
460	69	25	7,150	1,012	0.0620	0.0619	0.0556	0.0469	-2,738	0.0420	0.0429	-3,147	-2,943
489	67	40	7,150	1,012	0.0618	0.0619	0.0555	0.0466	-2,763	0.0419	0.0424	-3,198	-2,980
516	65	49	7,150	1,012	0.0616	0.0616	0.0555	0.0466	-2,700	0.0417	0.0417	-3,248	-2,974
551	71	60	7,150	1,012	0.0620	0.0620	0.0559	0.0469	-2,712	0.0421	0.0431	-3,123	-2,918
589	70	53	7,150	1,012	0.0620	0.0620	0.0555	0.0469	-2,763	0.0421	0.0421	-3,248	-3,005
0	0	0	0	0	0.0621	0.0621	0.0607	0.0456	-2,300	0.0448	0.0423	-2,910	-2,605

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: MASTER BUILDERS - EMACOR 310

Batch Id.: Material No. 10

Sealed

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Zero-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)		Specimen 1		Specimen 2		Length Change (millionths)		
					Reading 1 (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)		Reading 2 (inches)	
5	71	38	no load	0	0.0707	0.0709	0.0640	0.0339	---	0.0662	0.0669	---	---
5	71	38	no load	0	0.0707	0.0709	0.0640	0.0339	0	0.0662	0.0669	0	0
7	73	50	no load	0	0.0711	0.0710	0.0644	0.0334	-84	0.0654	0.0662	-262	-173
7	73	50	no load	0	0.0711	0.0710	0.0644	0.0334	-84	0.0654	0.0662	-262	-173
16	71	50	no load	0	0.0711	0.0713	0.0643	0.0342	-34	0.0670	0.0670	3	-16
28	73	50	no load	0	0.0730	0.0730	0.0660	0.0360	-59	0.0686	0.0691	11	-24
28	73	50	no load	0	0.0730	0.0730	0.0660	0.0360	-59	0.0686	0.0691	11	-24
34	72	55	no load	0	0.0749	0.0768	0.0701	0.0398	218	0.0718	0.0728	165	191
44	73	48	no load	0	0.0726	0.0726	0.0652	0.0353	-133	0.0680	0.0681	-90	-111
63	73	50	no load	0	0.0727	0.0730	0.0648	0.0345	-351	0.0673	0.0678	-275	-313
93	74	45	no load	0	0.0727	0.0726	0.0647	0.0346	-299	0.0671	0.0676	-289	-289
126	72	55	no load	0	0.0722	0.0722	0.0631	0.0334	-537	0.0658	0.0663	-486	-512
162	71	50	no load	0	0.0711	0.0710	0.0617	0.0317	-638	0.0640	0.0646	-634	-636
187	70	45	no load	0	0.0705	0.0705	0.0608	0.0309	-712	0.0630	0.0637	-734	-723
222	68	52	no load	0	0.0688	0.0688	0.0608	0.0313	-237	0.0583	0.0685	-296	-267
250	68	54	no load	0	0.0687	0.0688	0.0583	0.0285	-888	0.0608	0.0611	-896	-892
287	68	55	no load	0	0.0614	0.0612	0.0494	0.0240	-700	0.0540	0.0540	-736	-736
315	68	55	no load	0	0.0612	0.0612	0.0486	0.0180	-1,525	0.0521	0.0521	-1,221	-1,373
341	72	51	no load	0	0.0615	0.0615	0.0487	0.0181	-1,575	0.0519	0.0523	-1,436	-1,436
378	64	48	no load	0	0.0619	0.0619	0.0489	0.0180	-1,662	0.0518	0.0522	-1,421	-1,542
405	68	37	no load	0	0.0620	0.0620	0.0490	0.0181	-1,662	0.0518	0.0521	-1,459	-1,561
428	68	42	no load	0	0.0619	0.0620	0.0489	0.0180	-1,675	0.0518	0.0520	-1,459	-1,567
460	69	25	no load	0	0.0620	0.0619	0.0488	0.0179	-1,700	0.0518	0.0519	-1,471	-1,586
489	67	40	no load	0	0.0618	0.0619	0.0487	0.0178	-1,700	0.0519	0.0519	-1,434	-1,567
516	65	49	no load	0	0.0616	0.0616	0.0481	0.0176	-1,738	0.0514	0.0514	-1,496	-1,617
551	71	60	no load	0	0.0620	0.0620	0.0480	0.0176	-1,850	0.0516	0.0517	-1,534	-1,692
589	70	53	no load	0	0.0620	0.0620	0.0483	0.0179	-1,775	0.0520	0.0518	-1,623	-1,761
0	0	0	no load	0	0.0621	0.0621	0.0478	0.0176	-1,900	0.0514	0.0514	-1,621	-1,761

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: MASTER BUILDERS - EMACO SR-66

Batch id.: Material No. 11

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)				
	Temp. (deg. F)	Humidity (Rel.Hum.)			Reading 1 (inches)		Reading 2 (inches)		Length Change (millionths)		Reading 1 (inches)			Reading 2 (inches)		Length Change (millionths)	
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)		Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)
5	73	50	0	0	0.0714	0.0713	0.0659	0.0647	0	0.0687	0.0675	0	0	0			
5	73	50	15,656	2,210	0.0715	0.0714	0.0654	0.0637	-205	0.0676	0.0669	-225	-215				
5	73	50	15,656	2,210	0.0712	0.0709	0.0650	0.0631	-243	0.0669	0.0659	-295	-285				
7	69	45	18,539	2,617	0.0713	0.0712	0.0635	0.0621	-602	0.0649	0.0646	-813	-707				
16	70	46	18,539	2,617	0.0710	0.0709	0.0604	0.0590	-1,294	0.0609	0.0614	-1,629	-1,461				
23	70	44	18,539	2,617	0.0721	0.0721	0.0609	0.0590	-1,529	0.0618	0.0628	-1,630	-1,579				
28	72	47	18,539	2,617	0.0719	0.0719	0.0605	0.0586	-1,577	0.0607	0.0619	-1,834	-1,706				
28	72	47	27,213	3,842	0.0719	0.0717	0.0607	0.0578	-1,634	0.0616	0.0614	-1,768	-1,701				
48	72	55	21,309	3,008	0.0768	0.0742	0.0609	0.0556	-2,799	0.0624	0.0603	-2,724	-2,761				
50	70	51	21,309	3,008	0.0750	0.0748	0.0628	0.0564	-2,320	0.0647	0.0600	-2,321	-2,321				
50	70	51	26,595	3,755	0.0747	0.0750	0.0630	0.0648	-1,236	0.0570	0.0595	-3,339	-2,287				
58	73	48	26,595	3,755	0.0726	0.0724	0.0603	0.0550	-2,196	0.0620	0.0571	-2,419	-2,308				
77	73	50	26,595	3,755	0.0730	0.0732	0.0618	0.0550	-2,170	0.0629	0.0569	-2,329	-2,329				
107	74	45	26,595	3,755	0.0726	0.0728	0.0605	0.0538	-2,383	0.0627	0.0553	-2,613	-2,498				
140	72	55	26,595	3,755	0.0722	0.0722	0.0596	0.0520	-2,590	0.0617	0.0540	-2,775	-2,682				
176	71	50	26,595	3,755	0.0710	0.0710	0.0580	0.0494	-2,815	0.0597	0.0511	-3,085	-2,950				
201	70	45	26,595	3,755	0.0705	0.0705	0.0573	0.0479	-2,965	0.0595	0.0494	-3,197	-3,081				
236	68	52	26,595	3,755	0.0689	0.0689	0.0554	0.0455	-3,103	0.0575	0.0467	-3,385	-3,244				
262	68	54	26,595	3,755	0.0689	0.0688	0.0556	0.0451	-3,115	0.0579	0.0464	-3,360	-3,237				
299	68	55	26,595	3,755	0.0613	0.0612	0.0462	0.0343	-3,740	0.0489	0.0357	-3,922	-3,831				
327	68	55	26,595	3,755	0.0612	0.0612	0.0456	0.0341	-3,827	0.0489	0.0355	-3,935	-3,881				
353	72	51	26,595	3,755	0.0615	0.0616	0.0465	0.0340	-3,815	0.0493	0.0351	-4,023	-3,919				
390	64	48	26,595	3,755	0.0619	0.0619	0.0453	0.0336	-4,102	0.0488	0.0348	-4,210	-4,156				
417	68	37	26,595	3,755	0.0620	0.0621	0.0458	0.0334	-4,103	0.0490	0.0350	-4,198	-4,150				
440	68	42	26,595	3,755	0.0619	0.0619	0.0455	0.0333	-4,115	0.0489	0.0345	-4,235	-4,175				
472	69	25	26,595	3,755	0.0620	0.0620	0.0450	0.0328	-4,265	0.0485	0.0340	-4,373	-4,319				
501	67	40	26,595	3,755	0.0617	0.0617	0.0451	0.0325	-4,215	0.0485	0.0338	-4,323	-4,269				
528	65	49	26,595	3,755	0.0617	0.0617	0.0450	0.0325	-4,227	0.0482	0.0335	-4,398	-4,312				
563	71	60	26,595	3,755	0.0621	0.0621	0.0457	0.0327	-4,215	0.0489	0.0339	-4,360	-4,288				
601	70	53	26,595	3,755	0.0620	0.0622	0.0458	0.0329	-4,178	0.0490	0.0339	-4,348	-4,263				
0	0	0	0	0	0.0621	0.0621	0.0468	0.0378	-3,440	0.0494	0.0399	-3,548	-3,494				

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: MASTER BUILDERS - EMACO SR-66

Batch id.: Material No. 11

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
5	73	50	0	0	0.0714	0.0713	0.0661	0.0663	0	0.0660	0.0674	0	0
5	73	50	7,828	1,105	0.0715	0.0714	0.0661	0.0663	-35	0.0656	0.0670	-127	-81
7	69	45	7,828	1,105	0.0712	0.0709	0.0659	0.0655	-59	0.0649	0.0668	-133	-96
7	69	45	9,269	1,309	0.0713	0.0712	0.0653	0.0650	-245	0.0643	0.0655	-425	-335
16	70	46	9,269	1,309	0.0710	0.0709	0.0632	0.0630	-669	0.0621	0.0635	-870	-769
23	70	44	9,269	1,309	0.0721	0.0721	0.0631	0.0636	-901	0.0634	0.0636	-978	-939
28	72	47	9,269	1,309	0.0719	0.0719	0.0632	0.0631	-899	0.0640	0.0634	-886	-892
28	72	47	13,606	1,921	0.0719	0.0717	0.0625	0.0625	-1,047	0.0619	0.0621	-1,288	-1,167
48	72	55	10,655	1,504	0.0768	0.0742	0.0651	0.0614	-1,771	0.0668	0.0605	-1,794	-1,782
50	70	51	10,655	1,504	0.0750	0.0748	0.0645	0.0653	-1,216	0.0640	0.0663	-1,266	-1,241
50	70	51	13,298	1,877	0.0747	0.0750	0.0645	0.0654	-1,191	0.0642	0.0655	-1,339	-1,265
58	73	48	13,298	1,877	0.0726	0.0724	0.0616	0.0626	-1,317	0.0614	0.0629	-1,424	-1,371
77	73	50	13,298	1,877	0.0730	0.0732	0.0628	0.0639	-1,155	0.0623	0.0639	-1,333	-1,244
107	74	45	13,298	1,877	0.0726	0.0728	0.0620	0.0629	-1,279	0.0616	0.0628	-1,468	-1,373
140	72	55	13,298	1,877	0.0722	0.0722	0.0609	0.0621	-1,390	0.0604	0.0621	-1,577	-1,484
176	71	50	13,298	1,877	0.0710	0.0710	0.0585	0.0600	-1,650	0.0590	0.0600	-1,772	-1,711
201	70	45	13,298	1,877	0.0705	0.0705	0.0578	0.0598	-1,637	0.0577	0.0590	-1,872	-1,755
236	68	52	13,298	1,877	0.0689	0.0689	0.0560	0.0573	-1,775	0.0557	0.0572	-1,948	-1,861
262	68	54	13,298	1,877	0.0689	0.0688	0.0561	0.0572	-1,762	0.0559	0.0571	-1,923	-1,842
299	68	55	13,298	1,877	0.0613	0.0612	0.0463	0.0477	-2,275	0.0462	0.0476	-2,423	-2,349
327	68	55	13,298	1,877	0.0612	0.0612	0.0460	0.0472	-2,362	0.0458	0.0469	-2,547	-2,455
353	72	51	13,298	1,877	0.0615	0.0616	0.0460	0.0479	-2,362	0.0460	0.0478	-2,498	-2,430
390	64	48	13,298	1,877	0.0619	0.0619	0.0465	0.0478	-2,400	0.0459	0.0468	-2,722	-2,561
417	68	37	13,298	1,877	0.0620	0.0621	0.0463	0.0475	-2,500	0.0460	0.0469	-2,735	-2,617
440	68	42	13,298	1,877	0.0619	0.0619	0.0461	0.0474	-2,500	0.0458	0.0471	-2,697	-2,599
472	69	25	13,298	1,877	0.0620	0.0620	0.0456	0.0469	-2,650	0.0455	0.0464	-2,848	-2,749
501	67	40	13,298	1,877	0.0617	0.0617	0.0455	0.0475	-2,512	0.0454	0.0471	-2,698	-2,605
528	65	49	13,298	1,877	0.0617	0.0617	0.0453	0.0467	-2,637	0.0453	0.0463	-2,810	-2,724
563	71	60	13,298	1,877	0.0621	0.0621	0.0458	0.0472	-2,612	0.0458	0.0469	-2,773	-2,692
601	70	53	13,298	1,877	0.0620	0.0622	0.0460	0.0474	-2,562	0.0459	0.0469	-2,760	-2,661
0	0	0	0	0	0.0621	0.0621	0.0470	0.0489	-2,250	0.0469	0.0470	-2,623	-2,436

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: MASTER BUILDERS - EMACO SR-66

Batch id.: Material No. 11

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Zero-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1		Specimen 2		Length Change (millionths)		
							Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)		Reading 2 (inches)	
5	73	50	no load	0	0.0714	0.0713	0.0675	0.0616	---	0.0633	0.0690	---	---
5	73	50	no load	0	0.0714	0.0713	0.0675	0.0616	0	0.0633	0.0690	0	0
7	69	45	no load	0	0.0712	0.0709	0.0665	0.0612	-109	0.0631	0.0648	-490	-299
7	69	45	no load	0	0.0712	0.0709	0.0665	0.0612	-109	0.0631	0.0648	-490	-299
16	70	46	no load	0	0.0710	0.0709	0.0651	0.0601	-400	0.0614	0.0635	-829	-614
23	70	44	no load	0	0.0721	0.0721	0.0656	0.0605	-556	0.0617	0.0640	-1,014	-785
28	72	47	no load	0	0.0719	0.0719	0.0653	0.0607	-524	0.0618	0.0640	-958	-741
28	72	47	no load	0	0.0719	0.0719	0.0653	0.0607	-524	0.0618	0.0640	-958	-741
48	72	55	no load	0	0.0768	0.0742	0.0695	0.0646	-415	0.0657	0.0680	-869	-642
50	70	51	no load	0	0.0750	0.0748	0.0678	0.0630	-686	0.0637	0.0665	-1,159	-922
50	70	51	no load	0	0.0750	0.0748	0.0678	0.0630	-686	0.0637	0.0665	-1,159	-922
58	73	48	no load	0	0.0726	0.0724	0.0654	0.0607	-659	0.0622	0.0645	-989	-824
77	73	50	no load	0	0.0730	0.0732	0.0658	0.0610	-727	0.0625	0.0646	-1,098	-913
107	74	45	no load	0	0.0726	0.0728	0.0654	0.0606	-741	0.0620	0.0642	-1,120	-931
140	72	55	no load	0	0.0722	0.0722	0.0648	0.0600	-762	0.0615	0.0635	-1,120	-951
176	71	50	no load	0	0.0710	0.0710	0.0632	0.0586	-830	0.0600	0.0620	-1,020	-1,020
201	70	45	no load	0	0.0705	0.0705	0.0627	0.0580	-842	0.0593	0.0615	-1,235	-1,039
236	68	52	no load	0	0.0689	0.0689	0.0605	0.0560	-967	0.0572	0.0594	-1,360	-1,164
262	68	54	no load	0	0.0689	0.0688	0.0610	0.0560	-892	0.0574	0.0595	-1,310	-1,101
299	68	55	no load	0	0.0613	0.0612	0.0534	0.0472	-1,042	0.0490	0.0510	-1,522	-1,282
327	68	55	no load	0	0.0612	0.0612	0.0533	0.0461	-1,180	0.0480	0.0503	-1,723	-1,451
353	72	51	no load	0	0.0615	0.0616	0.0523	0.0463	-1,367	0.0480	0.0509	-1,735	-1,551
390	64	48	no load	0	0.0619	0.0619	0.0524	0.0464	-1,430	0.0480	0.0509	-1,822	-1,626
417	68	37	no load	0	0.0620	0.0621	0.0526	0.0466	-1,417	0.0484	0.0511	-1,785	-1,601
440	68	42	no load	0	0.0619	0.0619	0.0528	0.0465	-1,367	0.0484	0.0510	-1,760	-1,564
472	69	25	no load	0	0.0620	0.0620	0.0531	0.0466	-1,342	0.0486	0.0510	-1,760	-1,551
501	67	40	no load	0	0.0617	0.0617	0.0526	0.0463	-1,367	0.0485	0.0509	-1,710	-1,539
528	65	49	no load	0	0.0617	0.0617	0.0525	0.0462	-1,392	0.0481	0.0508	-1,592	-1,539
563	71	60	no load	0	0.0621	0.0621	0.0530	0.0467	-1,367	0.0487	0.0517	-1,685	-1,526
601	70	53	no load	0	0.0620	0.0622	0.0530	0.0466	-1,380	0.0486	0.0516	-1,545	-1,545
0	0	0	no load	0	0.0621	0.0621	0.0530	0.0462	-1,430	0.0479	0.0508	-1,898	-1,664

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: SIKA - SIKATOP III

Batch id.: Material No. 12

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (High-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial Final (inches)		Specimen 1		Specimen 2				
					Reading 1 (inches)	Reading 2 (inches)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	
3	71	50	0	0	0.0721	0.0721	0.0676	0.0682	0	0.0684	0.0636	0	0
3	71	50	10,400	1,482	0.0713	0.0717	0.0657	0.0668	-250	0.0676	0.0618	-168	-209
7	72	44	10,400	1,482	0.0713	0.0717	0.0649	0.0647	-615	0.0660	0.0614	-424	-519
7	72	44	13,800	1,966	0.0717	0.0714	0.0633	0.0637	-950	0.0655	0.0607	-588	-769
31	73	48	13,800	1,966	0.0724	0.0724	0.0617	0.0623	-1,545	0.0615	0.0573	-1,734	-1,639
50	73	50	13,800	1,966	0.0732	0.0730	0.0604	0.0616	-1,964	0.0625	0.0560	-1,935	-1,949
80	74	45	13,800	1,966	0.0728	0.0727	0.0592	0.0605	-2,164	0.0607	0.0544	-2,276	-2,220
113	72	55	13,800	1,966	0.0722	0.0722	0.0582	0.0594	-2,296	0.0599	0.0537	-2,326	-2,311
149	71	50	13,800	1,966	0.0710	0.0710	0.0564	0.0570	-2,512	0.0578	0.0510	-2,624	-2,568
174	70	45	13,800	1,966	0.0705	0.0705	0.0555	0.0563	-2,587	0.0570	0.0505	-2,661	-2,624
209	68	52	13,800	1,966	0.0689	0.0689	0.0540	0.0546	-2,587	0.0545	0.0497	-2,674	-2,631
235	68	54	13,800	1,966	0.0689	0.0689	0.0540	0.0544	-2,613	0.0562	0.0483	-2,636	-2,624
272	68	55	13,800	1,966	0.0613	0.0610	0.0435	0.0449	-3,175	0.0440	0.0385	-3,449	-3,312
300	68	55	13,800	1,966	0.0612	0.0611	0.0425	0.0444	-3,362	0.0451	0.0377	-3,411	-3,387
326	72	51	13,800	1,966	0.0615	0.0615	0.0430	0.0447	-3,350	0.0442	0.0379	-3,586	-3,468
363	64	48	13,800	1,966	0.0619	0.0620	0.0439	0.0444	-3,387	0.0439	0.0379	-3,736	-3,562
390	68	37	13,800	1,966	0.0620	0.0620	0.0431	0.0446	-3,475	0.0442	0.0380	-3,699	-3,587
413	68	42	13,800	1,966	0.0619	0.0620	0.0435	0.0445	-3,425	0.0461	0.0384	-3,399	-3,412
445	69	25	13,800	1,966	0.0619	0.0620	0.0423	0.0444	-3,587	0.0443	0.0375	-3,736	-3,662
474	67	40	13,800	1,966	0.0617	0.0618	0.0421	0.0440	-3,612	0.0439	0.0379	-3,686	-3,649
501	65	49	13,800	1,966	0.0616	0.0616	0.0421	0.0438	-3,600	0.0437	0.0379	-3,674	-3,637
536	71	60	13,800	1,966	0.0619	0.0620	0.0421	0.0441	-3,650	0.0440	0.0376	-3,761	-3,706
574	70	53	13,800	1,966	0.0620	0.0620	0.0421	0.0442	-3,650	0.0440	0.0379	-3,736	-3,693
0	0	0	0	0	0.0621	0.0621	0.0438	0.0459	-3,250	0.0462	0.0390	-3,349	-3,299

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: Sika - Sika TOP III

Batch id.: Material No. 12

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Low-Stress Specimens)						Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Reading 1		Reading 2		Length Change		Specimen 2		
					(inches)	(inches)	(inches)	(inches)	(millionths)	(millionths)	(inches)	(inches)	
3	71	50	0	0	0.0721	0.0721	0.0694	0.0720	0	0.0679	0.0710	0	0
3	71	50	5,200	741	0.0713	0.0717	0.0677	0.0729	54	0.0664	0.0685	-340	-143
7	72	44	5,200	741	0.0713	0.0717	0.0676	0.0683	-535	0.0659	0.0669	-609	-572
7	72	44	6,900	983	0.0717	0.0714	0.0670	0.0681	-647	0.0659	0.0663	-693	-670
31	73	48	6,900	983	0.0724	0.0724	0.0653	0.0674	-1,164	0.0652	0.0660	-1,040	-1,102
50	73	50	6,900	983	0.0732	0.0730	0.0660	0.0683	-1,132	0.0648	0.0657	-1,292	-1,212
80	74	45	6,900	983	0.0728	0.0727	0.0653	0.0665	-1,362	0.0642	0.0648	-1,376	-1,476
113	72	55	6,900	983	0.0722	0.0722	0.0643	0.0657	-1,445	0.0636	0.0635	-1,506	-1,476
149	71	50	6,900	983	0.0710	0.0710	0.0622	0.0634	-1,692	0.0618	0.0617	-1,667	-1,736
174	70	45	6,900	983	0.0705	0.0705	0.0612	0.0627	-1,780	0.0608	0.0613	-1,692	-1,736
209	68	52	6,900	983	0.0689	0.0689	0.0599	0.0609	-1,768	0.0588	0.0594	-1,774	-1,905
235	68	54	6,900	983	0.0687	0.0687	0.0586	0.0606	-1,917	0.0580	0.0589	-1,892	-2,286
272	68	55	6,900	983	0.0613	0.0610	0.0506	0.0518	-2,130	0.0485	0.0489	-2,442	-2,330
300	68	55	6,900	983	0.0612	0.0611	0.0495	0.0520	-2,242	0.0483	0.0493	-2,417	-2,311
326	72	51	6,900	983	0.0615	0.0615	0.0499	0.0524	-2,230	0.0490	0.0495	-2,392	-2,236
363	64	48	6,900	983	0.0619	0.0620	0.0499	0.0527	-2,305	0.0512	0.0500	-2,167	-2,449
390	68	37	6,900	983	0.0620	0.0620	0.0497	0.0522	-2,405	0.0491	0.0496	-2,493	-2,399
413	68	42	6,900	983	0.0619	0.0620	0.0499	0.0522	-2,368	0.0495	0.0496	-2,430	-2,555
445	69	25	6,900	983	0.0619	0.0620	0.0493	0.0520	-2,467	0.0485	0.0489	-2,642	-2,518
474	67	40	6,900	983	0.0617	0.0618	0.0492	0.0519	-2,443	0.0482	0.0492	-2,592	-2,449
501	65	49	6,900	983	0.0616	0.0616	0.0490	0.0518	-2,443	0.0493	0.0489	-2,455	-2,480
536	71	60	6,900	983	0.0619	0.0620	0.0499	0.0519	-2,405	0.0489	0.0492	-2,555	-2,393
574	70	53	6,900	983	0.0620	0.0620	0.0502	0.0520	-2,368	0.0499	0.0494	-2,417	-2,074
0	0	0	0	0	0.0621	0.0621	0.0506	0.0524	-2,292	0.0477	0.0563	-1,855	

COMPRESSIVE CREEP TEST (ASTM C 512, 3" by 6" Cylindrical Specimens)

Product being tested: Sika - Sika TOP III

Batch id.: Material No. 12

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Zero-Stress Specimens)								Average Length Change (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1			Specimen 2					
							Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)	Reading 1 (inches)	Reading 2 (inches)	Length Change (millionths)			
3	71	50	no load	0	0.0721	0.0721	0.0690	0.0685	---	0.0693	0.0706	---	---		
3	71	50	no load	0	0.0721	0.0721	0.0690	0.0685	0	0.0693	0.0706	0	0		
7	72	44	no load	0	0.0713	0.0717	0.0678	0.0672	-148	0.0681	0.0698	-95	-121		
7	72	44	no load	0	0.0713	0.0717	0.0678	0.0672	-148	0.0681	0.0698	-95	-121		
31	73	48	no load	0	0.0724	0.0724	0.0686	0.0680	-195	0.0691	0.0703	-139	-167		
50	73	50	no load	0	0.0732	0.0730	0.0693	0.0685	-207	0.0694	0.0706	-229	-218		
80	74	45	no load	0	0.0728	0.0727	0.0685	0.0674	-351	0.0686	0.0698	-345	-348		
113	72	55	no load	0	0.0722	0.0722	0.0675	0.0668	-415	0.0678	0.0692	-381	-398		
149	71	50	no load	0	0.0710	0.0710	0.0660	0.0651	-515	0.0661	0.0675	-504	-509		
174	70	45	no load	0	0.0705	0.0705	0.0653	0.0645	-552	0.0656	0.0668	-529	-541		
209	68	52	no load	0	0.0689	0.0689	0.0633	0.0625	-653	0.0636	0.0650	-604	-628		
235	68	54	no load	0	0.0687	0.0687	0.0634	0.0625	-590	0.0636	0.0650	-554	-572		
272	68	55	no load	0	0.0613	0.0610	0.0556	0.0553	-577	0.0565	0.0578	-454	-516		
300	68	55	no load	0	0.0612	0.0611	0.0558	0.0549	-602	0.0560	0.0573	-579	-591		
326	72	51	no load	0	0.0615	0.0615	0.0560	0.0550	-652	0.0561	0.0575	-629	-641		
363	64	48	no load	0	0.0619	0.0620	0.0562	0.0551	-727	0.0562	0.0577	-704	-716		
390	68	37	no load	0	0.0620	0.0620	0.0564	0.0552	-702	0.0564	0.0578	-679	-691		
413	68	42	no load	0	0.0619	0.0620	0.0565	0.0552	-677	0.0563	0.0574	-729	-703		
445	69	25	no load	0	0.0619	0.0620	0.0564	0.0552	-690	0.0562	0.0577	-704	-697		
474	67	40	no load	0	0.0617	0.0618	0.0563	0.0552	-652	0.0562	0.0577	-654	-653		
501	65	49	no load	0	0.0616	0.0616	0.0561	0.0551	-653	0.0561	0.0573	-679	-666		
536	71	60	no load	0	0.0619	0.0620	0.0566	0.0551	-677	0.0565	0.0579	-641	-659		
574	70	53	no load	0	0.0620	0.0620	0.0567	0.0553	-652	0.0567	0.0579	-629	-641		
0	0	0	no load	0	0.0621	0.0621	0.0564	0.0553	-715	0.0562	0.0580	-704	-709		

Appendix I

Tensile Creep Data

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: FOSROC - PATCHROC 10-80

Batch id.: Material No. 1

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - 0.4" ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	72	55	0	0	912	913	928	922	0	---	922	926	0	---	922	926	0	---
4	74	55	0	0	912	913	928	922	0	0.0000	922	926	0	0.0000	922	926	0	0.0000
4	74	55	1,519	169	912	913	930	924	13	0.0758	927	935	45	0.2654	927	935	29	0.1706
7	72	60	1,519	169	923	922	925	915	-96	-0.5688	916	921	-99	-0.5783	916	921	-98	-0.5783
13	72	55	1,314	146	919	920	918	910	-115	-0.7890	908	918	-115	-0.7890	908	918	-115	-0.7890
14	72	55	1,314	146	924	922	917	909	-144	-0.9863	905	916	-154	-1.0521	905	916	-149	-1.0192
21	72	55	1,314	146	921	919	910	903	-166	-1.1397	899	913	-163	-1.1178	899	913	-165	-1.1288
28	72	55	1,314	146	920	920	908	900	-182	-1.2493	896	908	-189	-1.2932	896	908	-186	-1.2712
28	72	55	1,622	180	920	920	912	905	-154	-0.8523	899	909	-176	-0.9766	899	909	-165	-0.9144
35	68	55	1,622	180	917	918	903	897	-192	-1.0654	891	907	-192	-1.0654	891	907	-192	-1.0654
42	68	54	1,622	180	917	917	906	898	-176	-0.9766	893	906	-186	-1.0298	893	906	-181	-1.0032
52	68	54	1,622	180	916	917	901	894	-202	-1.1186	904	887	-208	-1.1541	904	887	-205	-1.1354
56	68	53	1,622	180	907	907	891	885	-202	-1.1186	880	896	-195	-1.0831	880	896	-198	-1.1009
81	70	51	1,622	180	907	907	891	884	-205	-1.1364	875	896	-211	-1.1719	875	896	-208	-1.1541
114	68	43	1,622	180	904	904	879	864	-288	-1.5980	860	882	-285	-1.5803	860	882	-286	-1.5891
144	69	45	1,622	180	901	901	879	861	-278	-1.5448	860	882	-266	-1.4737	860	882	-272	-1.5092
179	66	35	1,622	180	901	901	867	859	-323	-1.7933	845	869	-355	-1.9709	845	869	-339	-1.8821
201	70	30	1,622	180	902	902	869	859	-323	-1.7933	846	874	-342	-1.8999	846	874	-333	-1.8466
235	70	43	1,622	180	901	901	878	867	-262	-1.4560	857	883	-272	-1.5092	857	883	-267	-1.4826
269	64	43	1,622	180	901	901	871	862	-301	-1.6691	851	876	-314	-1.7401	851	876	-307	-1.7046
297	68	53	1,622	180	901	901	879	869	-253	-1.4027	858	884	-266	-1.4737	858	884	-259	-1.4382
333	70	51	1,622	180	901	901	881	872	-237	-1.3139	860	886	-253	-1.4027	860	886	-245	-1.3583

$$\Delta L = \left(\left(\frac{L_{XT1} + L_{XT2}}{2} - \frac{L_{RTI} + L_{RTI}}{2} \right) - \left(\frac{L_{XO1} + L_{XO2}}{2} - \frac{L_{RO1} + L_{RO1}}{2} \right) \right) \times \frac{0.016}{250} \times 1,000,000$$

WHERE:

- ΔL = Length Change (millionths)
 L_{XO1} = Reading of Specimen at Casting, Reading 1.
 L_{XO2} = Reading of Specimen at Casting, Reading 2.
 L_{XT1} = Reading of Specimen at Time T, Reading 1.
 L_{XT2} = Reading of Specimen at Time T, Reading 2.
 L_{RO1} = Reading of Reference Bar at Casting, Initial.
 L_{RO1} = Reading of Reference Bar at Casting, Final.
 L_{RT1} = Reading of Reference Bar at Time T, Initial.
 L_{RT1} = Reading of Reference Bar at Time T, Final.

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: FOSROC - PATCHROC 10-60

Batch id.: Material No. 1

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	55	no load	0	912	913	918	935	---	875	839	---	---
4	74	55	no load	0	912	913	918	935	0	875	839	0	0
7	72	55	no load	0	923	922	908	918	-150	855	809	-224	-187
13	72	55	no load	0	919	920	902	916	-157	854	814	-192	-174
14	72	55	no load	0	924	922	901	914	-189	855	817	-202	-195
21	72	55	no load	0	921	919	894	907	-214	848	810	-227	-221
28	72	55	no load	0	920	920	893	903	-230	843	805	-259	-245
35	68	55	no load	0	917	918	886	898	-253	834	798	-294	-274
42	68	54	no load	0	917	917	884	895	-266	832	795	-307	-286
53	68	54	no load	0	916	917	881	890	-288	827	790	-336	-312
56	68	53	no load	0	907	907	871	882	-285	818	781	-333	-309
81	70	51	no load	0	907	907	868	880	-301	815	778	-352	-326
114	68	43	no load	0	904	904	851	864	-387	799	762	-435	-411
144	69	45	no load	0	901	901	854	865	-355	799	763	-413	-384
179	66	35	no load	0	901	901	844	855	-419	789	752	-480	-450
201	70	30	no load	0	902	902	845	856	-419	790	754	-477	-448
235	70	43	no load	0	901	901	851	863	-371	795	760	-435	-403
269	64	43	no load	0	901	901	847	859	-397	791	755	-464	-430
297	68	53	no load	0	901	901	857	869	-333	799	765	-406	-370
333	70	51	no load	0	901	901	858	869	-330	800	766	-400	-365

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: AMSTONE - METROMIX 240

Batch Id.: Material No. 2

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - 0.4" Ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1					Specimen 2						
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	72	60	0	0	924	924	930	954	---	---	930	937	---	---	---	---		
3	72	60	1,084	120	924	923	936	957	32	0.2657	935	947	51	0.4251	42	0.3454		
5	72	55	1,084	120	922	922	925	941	-45	-0.3720	921	933	-29	-0.2391	-37	-0.3055		
7	72	55	1,084	120	923	924	921	932	-96	-0.7970	911	936	-61	-0.5048	-78	-0.6509		
7	72	55	1,146	127	923	923	921	934	-86	-0.6785	912	936	-54	-0.4272	-70	-0.5529		
11	72	55	1,146	127	920	921	906	922	-157	-1.2314	898	915	-150	-1.1812	-154	-1.2063		
14	72	55	1,146	127	925	921	896	911	-240	-1.8848	889	906	-224	-1.7592	-232	-1.8220		
21	72	55	1,146	127	920	920	887	899	-288	-2.2618	878	895	-275	-2.1613	-282	-2.2115		
28	68	55	1,146	127	921	921	879	892	-342	-2.6890	871	886	-333	-2.6136	-338	-2.6513		
28	68	55	1,436	160	920	920	879	893	-333	-2.0858	873	888	-314	-1.9655	-323	-2.0256		
38	68	55	1,436	160	917	917	865	877	-410	-2.5671	855	873	-400	-2.5070	-405	-2.5370		
42	68	56	1,436	160	917	917	861	873	-435	-2.7276	852	870	-419	-2.6273	-427	-2.6774		
49	68	54	1,436	160	917	916	861	868	-448	-2.8078	847	869	-435	-2.7276	-442	-2.7677		
56	68	53	1,436	160	907	907	843	852	-496	-3.1086	833	850	-480	-3.0084	-488	-3.0585		
79	70	51	1,436	160	907	907	832	839	-573	-3.5900	821	839	-554	-3.4696	-563	-3.5298		
112	68	43	1,436	160	904	904	807	816	-707	-4.4323	796	816	-688	-4.3120	-698	-4.3721		
142	69	45	1,436	160	901	901	802	808	-730	-4.5727	790	809	-710	-4.4524	-720	-4.5125		
177	66	35	1,436	160	901	901	785	791	-838	-5.2546	771	791	-829	-5.1944	-834	-5.2445		
199	70	30	1,436	160	902	902	785	790	-848	-5.3148	771	791	-835	-5.2345	-842	-5.2945		
233	70	43	1,436	160	901	901	782	792	-845	-5.2947	774	795	-806	-5.0540	-826	-5.1923		
267	64	43	1,436	160	901	901	777	782	-893	-5.5955	764	786	-867	-5.4351	-880	-5.5293		
295	68	53	1,436	160	901	901	781	787	-864	-5.4150	768	789	-845	-5.2947	-854	-5.3947		
331	70	51	1,436	160	901	901	781	787	-864	-5.4150	769	789	-842	-5.2747	-853	-5.3747		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: AMSTONE - METROMIX 240

Batch Id.: Material No. 2

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1		Specimen 2		Strain (millionths)		
					Initial (inches)	Final (inches)	Reading 1 (inches)	Strain (millionths)	Reading 1 (inches)	Strain (millionths)			
3	72	60	no load	0	924	924	923	930	---	930	927	---	---
5	72	55	no load	0	922	922	907	913	-93	913	905	-102	-102
7	72	55	no load	0	923	924	902	904	-147	909	896	-163	-155
11	72	55	no load	0	920	921	890	896	-192	896	886	-218	-205
14	72	55	no load	0	925	921	878	883	-288	883	896	-243	-266
21	72	55	no load	0	920	920	862	867	-371	868	857	-397	-384
28	68	55	no load	0	921	921	853	856	-442	856	849	-467	-454
38	68	55	no load	0	917	917	839	840	-512	841	835	-534	-523
42	68	56	no load	0	917	917	834	836	-541	837	829	-566	-554
49	68	54	no load	0	917	916	826	826	-595	827	821	-621	-608
56	68	53	no load	0	907	907	811	816	-614	813	808	-646	-630
79	70	51	no load	0	907	907	798	801	-704	798	795	-736	-720
112	68	43	no load	0	904	904	771	776	-851	769	768	-896	-874
142	69	45	no load	0	901	901	764	769	-877	762	760	-925	-901
177	66	35	no load	0	901	901	749	756	-966	746	746	-1,021	-994
199	70	30	no load	0	902	902	748	754	-982	743	745	-1,040	-1,011
233	70	43	no load	0	901	901	748	752	-982	743	744	-1,037	-1,010
267	64	43	no load	0	901	901	739	745	-1,034	734	734	-1,098	-1,066
295	68	53	no load	0	901	901	744	748	-1,008	739	738	-1,069	-1,038
331	70	51	no load	0	901	901	742	746	-1,021	736	737	-1,082	-1,051

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch id.: Material No. 3

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - 0.4" ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1					Specimen 2						
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	72	60	0	0	923	920	1.055	978	---	---	929	934	---	---	---	---		
3	72	60	697	77	924	923	1.061	983	22	0.2892	930	943	19	0.2479	21	0.2686		
7	72	55	697	77	920	920	1.031	957	-134	-1.7354	907	913	-128	-1.6528	-131	-1.6941		
7	72	55	1,145	127	920	921	1.038	954	-125	-0.9810	905	913	-138	-1.0816	-131	-1.0313		
13	72	55	1,145	127	921	921	1.015	934	-266	-2.0877	882	891	-285	-2.2986	-275	-2.1631		
14	68	55	1,145	127	920	920	1.010	930	-288	-2.2638	879	890	-291	-2.2989	-280	-2.2763		
21	68	56	1,145	127	919	919	992	911	-400	-3.1441	856	869	-426	-3.3453	-413	-3.2447		
28	68	54	1,145	127	917	917	973	894	-502	-3.9490	838	852	-525	-4.1251	-514	-4.0370		
28	68	54	1,848	205	917	917	977	901	-467	-2.2753	846	859	-477	-2.3221	-472	-2.2987		
39	68	53	1,848	205	907	907	959	880	-528	-2.5714	826	837	-547	-2.6649	-538	-2.6182		
46	68	54	1,848	205	907	907	954	875	-560	-2.7273	821	834	-573	-2.7896	-566	-2.7584		
53	69	52	1,848	205	907	907	953	872	-573	-2.7896	817	831	-595	-2.8987	-584	-2.8442		
60	71	52	1,848	205	907	907	952	870	-582	-2.8364	814	828	-614	-2.9922	-598	-2.9143		
67	70	51	1,848	205	907	907	946	866	-614	-2.9922	810	824	-640	-3.1169	-627	-3.0545		
75	70	52	1,848	205	907	907	945	863	-627	-3.0545	807	819	-656	-3.2416	-646	-3.1481		
100	68	43	1,848	205	904	904	931	850	-694	-3.3818	791	806	-739	-3.6000	-717	-3.4909		
130	69	45	1,848	205	901	901	929	848	-688	-3.3506	789	803	-736	-3.5844	-712	-3.4675		
153	72	44	1,848	205	901	901	920	841	-739	-3.6000	781	794	-790	-3.8494	-765	-3.7247		
165	66	35	1,848	205	901	901	918	842	-742	-3.6156	776	791	-816	-3.9740	-779	-3.7948		
187	70	30	1,848	205	902	902	920	841	-746	-3.6312	778	795	-803	-3.9117	-774	-3.7714		
221	70	43	1,848	205	901	901	925	846	-707	-3.4442	785	801	-755	-3.6779	-731	-3.5610		
255	64	43	1,848	205	901	901	920	840	-742	-3.6156	780	795	-790	-3.8494	-766	-3.7325		
283	68	53	1,848	205	901	901	924	844	-717	-3.4909	784	795	-778	-3.7870	-747	-3.6390		
319	70	51	1,848	205	901	901	926	845	-707	-3.4442	785	799	-762	-3.7091	-734	-3.5766		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: CONPROCO - ONE SHOT

Batch Id.: Material No. 3

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	60	no load	0	923	920	921	949	---	936	934	---	---
7	72	55	no load	0	920	920	892	917	-186	904	903	-192	-189
13	72	55	no load	0	921	921	875	889	-336	877	873	-381	-358
14	68	55	no load	0	920	920	870	885	-358	870	869	-410	-384
21	68	56	no load	0	919	919	836	861	-538	847	842	-563	-550
28	68	54	no load	0	917	917	818	841	-646	827	825	-669	-658
39	68	53	no load	0	907	907	789	812	-768	800	797	-781	-774
46	68	54	no load	0	907	907	783	806	-806	794	794	-810	-808
53	69	52	no load	0	907	907	776	800	-848	786	789	-851	-850
60	71	52	no load	0	907	907	774	797	-864	782	786	-874	-869
67	70	51	no load	0	907	907	769	791	-899	778	781	-902	-901
75	70	52	no load	0	907	907	764	787	-928	774	777	-928	-928
100	68	43	no load	0	904	904	746	770	-1021	755	759	-1027	-1024
130	69	45	no load	0	901	901	742	765	-1030	749	755	-1040	-1035
153	72	42	no load	0	901	901	735	758	-1075	742	748	-1085	-1080
165	66	35	no load	0	901	901	740	756	-1066	742	744	-1098	-1082
187	70	30	no load	0	902	902	740	757	-1069	742	746	-1098	-1083
221	70	43	no load	0	901	901	742	760	-1046	745	749	-1072	-1059
255	64	43	no load	0	901	901	736	753	-1088	738	742	-1117	-1102
283	68	53	no load	0	901	901	740	758	-1059	743	747	-1085	-1072
319	70	51	no load	0	901	901	741	759	-1053	744	748	-1078	-1066

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested FIVE STAR - STRUCTURAL CONCRETE

Batch Id.: Material No. 4

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - 0.4 * ft)								Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1				Specimen 2					
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)		
3	72	55	0	0	924	923	931	929	---	---	896	---	---	---	---	
6	72	55	1,207	134	921	921	933	928	19	0.1432	936	892	19	0.1432	19	
7	72	55	1,207	134	921	921	922	926	-22	-0.1670	927	888	-22	-0.1670	-22	
7	72	55	1,274	142	921	921	923	926	-19	-0.1356	927	889	-19	-0.1356	-19	
14	72	55	1,274	142	920	921	917	918	-61	-0.4295	915	878	-90	-0.6330	-75	
21	72	55	1,274	142	920	921	915	918	-67	-0.4747	916	875	-96	-0.6782	-82	
28	68	55	1,274	142	918	918	907	905	-118	-0.8364	903	867	-147	-1.0399	-133	
35	68	55	1,274	142	917	918	895	903	-160	-1.1303	899	864	-166	-1.1755	-163	
42	68	54	1,274	142	932	927	898	900	-237	-1.6728	902	863	-109	-0.7686	-173	
45	68	54	1,274	142	917	917	890	892	-208	-1.4694	895	857	-198	-1.4016	-203	
49	68	53	1,274	142	907	907	879	885	-202	-1.4242	882	846	-211	-1.4920	-206	
56	69	52	1,274	142	907	907	876	881	-224	-1.5824	878	842	-237	-1.6728	-230	
74	70	51	1,274	142	907	907	873	878	-243	-1.7181	876	840	-250	-1.7633	-246	
107	68	43	1,274	142	904	906	857	858	-346	-2.4414	861	824	-336	-2.3736	-341	
137	69	45	1,274	142	901	902	852	856	-339	-2.3962	853	820	-352	-2.4867	-346	
188	66	35	1,274	142	901	901	840	845	-416	-2.9368	839	808	-432	-3.0518	-424	
210	70	30	1,274	142	902	902	840	846	-419	-2.9614	840	810	-429	-3.0292	-424	
244	70	43	1,274	142	901	901	843	850	-390	-2.7579	846	817	-381	-2.6901	-386	
278	64	43	1,274	142	901	901	835	841	-445	-3.1422	838	807	-438	-3.0970	-442	
306	68	53	1,274	142	901	901	837	845	-426	-3.0066	842	811	-413	-2.9162	-419	
342	70	51	1,274	142	901	901	838	846	-419	-2.9614	842	812	-410	-2.8936	-414	

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: FIVE STAR - STRUCTURAL CONCRETE

Batch Id.: Material No. 4

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	55	no load	0	924	923	926	934	---	925	926	---	---
6	72	55	no load	0	921	921	920	931	-13	921	928	10	-2
7	72	55	no load	0	921	921	919	916	-64	920	915	-35	-50
14	72	55	no load	0	920	921	906	902	-147	908	902	-112	-130
21	72	55	no load	0	920	921	900	899	-176	900	893	-166	-171
28	68	55	no load	0	918	918	899	897	-170	895	892	-170	-170
35	68	55	no load	0	917	918	887	886	-240	885	882	-230	-235
42	68	54	no load	0	932	927	899	898	-240	902	903	-186	-213
45	68	54	no load	0	917	917	882	881	-269	878	882	-250	-259
49	68	52	no load	0	907	907	871	871	-272	868	869	-259	-266
56	68	52	no load	0	907	907	867	868	-294	864	866	-282	-288
74	70	51	no load	0	907	907	863	864	-320	860	864	-301	-310
107	68	43	no load	0	904	906	844	845	-429	839	845	-416	-422
137	69	45	no load	0	901	902	840	840	-435	835	841	-419	-427
188	66	35	no load	0	901	901	831	832	-486	825	832	-477	-482
210	70	30	no load	0	902	902	829	830	-506	824	831	-490	-498
244	70	43	no load	0	901	901	830	831	-493	826	832	-474	-483
278	64	43	no load	0	901	901	822	824	-541	818	824	-525	-533
306	68	53	no load	0	901	901	828	829	-506	824	829	-490	-498
342	70	51	no load	0	901	901	827	828	-512	824	828	-493	-502

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: W. R. GRACE - FASTRAK PATCH

Batch Id.: Material No. 5

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - 0.4" ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	72	55	0		922	921	878	915	---	---	928	919	---	---	---	---		
3	72	55	497	55	921	922	884	917	26	0.4636	933	925	35	0.6374	30	0.5505		
4	72	55	497	55	925	924	873	906	-64	-1.1590	908	912	-106	-1.9123	-85	-1.5356		
7	72	55	497	55	921	924	931	864	0	0.0000	873	870	-339	-6.1425	-170	-3.0712		
14	72	55	497	55	923	920	873	808	-358	-8.4901	835	831	-579	-10.4885	-469	-8.4893		
17	72	55	497	55	920	920	834	772	-589	-10.6624	811	805	-730	-13.2121	-659	-11.9372		
21	68	55	497	55	921	920	796	731	-845	-15.2982	781	775	-925	-16.7469	-885	-16.0225		
23	68	55	497	55	919	921	778	714	-954	-17.2684	768	760	-1011	-18.3115	-982	-17.7899		
28	68	56	497	55	918	918	734	675	-1206	-21.8463	734	727	-1213	-21.9622	-1210	-21.9042		
35	68	56	497	55	917	917	707	652	-1360	-24.6278	717	710	-1315	-23.8165	-1338	-24.2221		
44	68	53	497	55	907	907	685	631	-1434	-25.9606	701	693	-1357	-24.5698	-1395	-25.2652		
49	68	53	497	55	907	907	679	626	-1469	-26.5980	697	693	-1370	-24.8016	-1419	-25.6398		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: W. R. GRACE - FASTRAK PATCH

Batch id.: Material No. 5

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1 Reading 1 (inches)	Specimen 1 Reading 2 (inches)	Specimen 1 Strain (millionths)	Specimen 2 Reading 1 (inches)	Specimen 2 Reading 2 (inches)	Specimen 2 Strain (millionths)	
3	72	55	no load	0	922	921	929	890	---	924	923	---	---
4	72	55	no load	0	925	924	927	888	-32	930	922	-3	-18
7	72	55	no load	0	921	921	876	840	-326	877	882	-278	-302
14	72	55	no load	0	923	920	796	766	-822	798	797	-806	-814
17	72	55	no load	0	920	920	756	726	-1,069	755	760	-1,053	-1,061
21	68	55	no load	0	921	920	712	676	-1,373	707	717	-1,347	-1,360
23	68	55	no load	0	919	921	695	655	-1,491	692	701	-1,443	-1,467
28	68	56	no load	0	918	918	651	605	-1,779	642	656	-1,734	-1,757
35	68	56	no load	0	917	917	609	558	-2,058	598	607	-2,026	-2,042
44	68	53	no load	0	907	907	565	508	-2,294	557	559	-2,246	-2,270
49	68	53	no load	0	907	907	549	492	-2,397	543	548	-2,326	-2,362
56	68	54	no load	0	907	907	540	483	-2,454	534	536	-2,394	-2,424
72	70	51	no load	0	907	907	516	459	-2,608	516	515	-2,518	-2,563
105	68	43	no load	0	906	905	464	406	-2,934	469	468	-2,810	-2,872
135	69	45	no load	0	902	902	462	400	-2,938	463	465	-2,816	-2,877
170	66	35	no load	0	901	901	433	369	-3,123	433	432	-3,011	-3,067
192	70	30	no load	0	902	902	434	368	-3,130	433	432	-3,018	-3,074
226	70	43	no load	0	901	901	449	384	-3,024	450	446	-2,912	-2,968
260	64	43	no load	0	901	901	439	375	-3,085	440	437	-2,973	-3,029
288	68	53	no load	0	901	901	450	385	-3,018	450	448	-2,906	-2,962
324	70	51	no load	0	901	901	443	380	-3,056	445	441	-2,944	-3,000

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested **EUCLID - SR - 93**

Batch id.: **Material No. 6**

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - 0.4 * Ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	72	60	0	0	921	923	941	929	---	---	937	950	---	---	---	---		
3	72	60	786	87	924	922	946	933	22	0.2565	943	962	51	0.5863	37	0.4214		
7	72	55	786	87	920	920	906	923	-118	-1.3557	913	929	-131	-1.5023	-125	-1.4290		
7	72	55	835	93	921	921	914	905	-157	-1.6901	913	922	-160	-1.7246	-158	-1.7073		
21	68	56	835	93	919	919	869	858	-438	-4.7253	867	872	-454	-4.8977	-446	-4.8115		
28	68	54	835	93	917	918	862	849	-480	-5.1737	857	866	-496	-5.3461	-488	-5.2599		
40	68	53	835	93	908	908	845	833	-525	-5.6565	841	850	-538	-5.7945	-531	-5.7255		
47	68	53	835	93	908	907	843	829	-541	-5.8290	839	846	-554	-5.9689	-547	-5.8980		
54	69	52	835	93	907	907	838	828	-557	-6.0014	837	843	-566	-6.1049	-562	-6.0532		
61	71	52	835	93	907	907	834	821	-570	-6.1394	835	842	-576	-6.2084	-573	-6.1739		
68	70	51	835	93	907	907	830	819	-592	-6.3808	831	838	-602	-6.4843	-597	-6.4326		
76	71	52	835	93	907	907	830	819	-611	-6.5878	828	834	-624	-6.7257	-618	-6.6568		
101	68	43	835	93	905	905	815	802	-707	-7.5535	815	819	-701	-7.5535	-701	-7.5535		
131	69	45	835	93	902	902	811	798	-707	-7.6225	807	812	-730	-7.8640	-718	-7.7432		
166	66	35	835	93	901	901	795	785	-794	-8.5538	791	796	-826	-8.8987	-810	-8.7262		
188	70	30	835	93	902	902	796	783	-803	-8.6572	791	798	-826	-8.8987	-814	-8.7780		
222	70	43	835	93	901	901	799	785	-781	-8.4158	796	802	-790	-8.5193	-786	-8.4675		
256	64	43	835	93	901	901	790	778	-832	-8.9677	788	795	-838	-9.0366	-835	-9.0022		
284	68	53	835	93	901	901	791	797	-826	-8.8987	791	797	-822	-8.8642	-824	-8.8814		
320	70	51	835	93	901	901	791	780	-822	-8.8642	789	797	-829	-8.9332	-826	-8.8987		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being teste EUCLID - SR - 93

Batch id.: Material No. 6

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (psi)	Strain (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	60	no load	0	924	922	931	933	---	931	926	---	---
7	72	55	no load	0	920	920	907	901	-160	904	899	-154	-157
21	68	56	no load	0	919	919	858	854	-461	854	848	-470	-466
28	68	54	no load	0	917	918	847	845	-515	844	839	-522	-518
40	68	53	no load	0	908	908	830	827	-566	828	821	-570	-568
47	68	54	no load	0	908	907	825	823	-592	824	819	-586	-589
54	69	52	no load	0	907	907	824	820	-602	822	816	-598	-600
61	71	52	no load	0	907	907	822	818	-614	819	814	-614	-614
68	70	51	no load	0	907	907	818	815	-637	816	811	-634	-635
76	71	52	no load	0	907	907	812	807	-682	814	810	-643	-662
101	68	43	no load	0	905	905	796	793	-765	795	790	-755	-760
131	69	45	no load	0	902	902	791	788	-778	790	785	-768	-773
166	66	35	no load	0	901	901	781	777	-838	779	774	-832	-835
188	70	30	no load	0	902	902	778	775	-861	776	772	-854	-858
222	70	43	no load	0	901	901	780	776	-845	778	774	-835	-840
256	64	43	no load	0	901	901	772	767	-899	769	766	-890	-894
284	68	53	no load	0	901	901	774	771	-880	772	768	-874	-877
320	70	51	no load	0	901	901	774	770	-883	771	768	-877	-880

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: CONPROCO - CONPRO - SET
Batch id.: Material # 7

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - 0.4 * ft)								Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Initial (inches)	Final (inches)	Specimen 1				Specimen 2					
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)		
3	72	55	0	0	921	921	924	926	---	---	932	922	---	---		
3	72	55	1,015	113	921	924	932	935	45	0.3972	943	935	67	0.5959		
5	72	55	1,084	120	922	922	925	941	45	0.3720	921	933	-6	-0.0531		
7	72	55	1,084	120	923	924	921	932	-6	-0.0531	911	938	-38	-0.3188		
7	72	55	1,146	127	923	923	921	934	3	0.0251	912	936	-32	-0.2513		
													-14	-0.1131		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: CONPROCO - CONPRO - SET

Batch id.: Material # 7

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1			Specimen 2			
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	55	no load	0	921	921	932	957	---	929	930	---	---
5	72	55	no load	0	922	922	907	913	-227	913	905	-138	-182
7	72	55	no load	0	923	924	902	904	-282	909	896	-189	-235

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: CONPROCO - CONPRO - SET

Batch Id.: Material # 7

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Second Cast - 0.4 * ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	68	55	0	0	915	916	924	902	---	---	923	920	---	---	---	---	---	---
3	68	55	1,015	113	918	918	935	926	96	0.8512	932	935	61	0.5391	932	935	78	0.6952
7	68	54	1,086	121	917	917	896	882	-163	-1.3525	894	896	-179	-1.4851	894	896	-171	-1.4188
7	68	54	1,086	121	918	925	910	894	-109	-0.9017	903	909	-138	-1.1403	903	909	-123	-1.0210
14	68	53	1,086	121	907	907	855	835	-381	-3.1558	844	860	-390	-3.2354	844	860	-386	-3.1958
21	68	54	1,086	121	907	907	828	804	-566	-4.6939	818	836	-550	-4.6276	818	836	-558	-4.6276
28	68	52	1,086	121	907	907	807	781	-707	-5.6608	798	816	-678	-5.6221	798	816	-693	-5.7414
28	69	52	1,683	187	907	907	801	763	-3.6963	800	818	816	818	-3.5594	800	818	-666	-3.6278
35	71	52	1,683	187	907	907	788	769	-765	-4.0898	788	809	-733	-3.9187	788	809	-749	-4.0043
42	70	51	1,683	187	907	907	785	754	-854	-4.5690	786	774	-819	-3.9187	786	774	-749	-4.0043
50	71	52	1,683	187	907	907	775	740	-941	-5.0310	760	785	-899	-4.3807	760	785	-837	-4.4749
57	71	51	1,683	187	906	906	766	727	-1005	-5.3733	748	774	-968	-5.1679	748	774	-920	-4.9198
65	71	53	1,683	187	907	906	759	720	-1053	-5.6299	738	767	-1024	-5.4759	738	767	-988	-5.2706
75	68	43	1,683	187	905	904	747	706	-1123	-6.0084	726	755	-1088	-5.8182	726	755	-1038	-5.5529
105	69	45	1,683	187	902	902	736	694	-1174	-6.2802	712	742	-1158	-6.1847	712	742	-1108	-5.9123
140	66	35	1,683	187	901	901	721	672	-1293	-6.9134	689	724	-1283	-6.8620	689	724	-1268	-6.2374
162	70	30	1,683	187	902	902	719	669	-1315	-7.0332	688	723	-1296	-6.9305	688	723	-1288	-6.8877
196	70	43	1,683	187	901	901	722	671	-1293	-6.9134	691	727	-1267	-6.7765	691	727	-1260	-6.9818
230	64	43	1,683	187	901	901	713	660	-1357	-7.2556	681	719	-1325	-7.0845	681	719	-1280	-6.8449
258	68	53	1,683	187	901	901	719	665	-1322	-7.0674	687	725	-1286	-6.8791	687	725	-1286	-6.8791
294	70	51	1,683	187	901	901	721	667	-1309	-6.9989	687	725	-1286	-6.8791	687	725	-1286	-6.8791

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: CONPROCO - CONPRO - SET
Batch Id.: Material # 7

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Second Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	55	no load	0	915	916	923	1158	---	1019	1147	---	---
7	68	54	no load	0	917	917	882	1117	-272	974	1,094	-323	-298
14	68	53	no load	0	907	907	831	1059	-557	919	1,039	-611	-584
21	68	54	no load	0	907	907	800	1025	-765	886	1,004	-829	-797
28	69	52	no load	0	907	907	776	998	-928	860	976	-1,002	-965
35	71	52	no load	0	907	907	759	978	-1,046	840	954	-1,136	-1,091
42	70	51	no load	0	907	907	742	960	-1,158	823	934	-1,254	-1,206
50	71	52	no load	0	907	907	727	944	-1,258	806	916	-1,366	-1,312
57	71	51	no load	0	906	906	715	927	-1,344	791	901	-1,456	-1,400
65	71	53	no load	0	907	906	702	918	-1,418	781	887	-1,536	-1,477
75	68	43	no load	0	905	904	690	901	-1,498	765	870	-1,629	-1,563
105	69	45	no load	0	902	902	673	884	-1,590	746	850	-1,738	-1,664
140	66	35	no load	0	901	901	649	858	-1,744	721	820	-1,907	-1,826
162	70	30	no load	0	902	902	643	849	-1,798	713	812	-1,965	-1,882
196	70	43	no load	0	901	901	639	844	-1,821	710	807	-1,984	-1,902
230	64	43	no load	0	901	901	628	833	-1,891	697	794	-2,067	-1,979
258	68	53	no load	0	901	901	631	838	-1,866	701	798	-2,042	-1,954
294	70	51	no load	0	901	901	630	835	-1,878	699	795	-2,058	-1,968

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: FOSROC DN - 116

Batch id.: Material No. 8

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - 0.4 * ft)										Average Strain (millionths)	Average Load Strain (millionth/psi)	
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2							
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionth/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionth/psi)					
3	72	55	0	0	921	921	926	834	---	---	949	923	---	---	957	933	---	---	---
3	72	55	1,120	124	922	922	936	846	64	---	---	921	933	51	---	---	---	58	---
5	72	55	1,084	120	922	922	925	941	333	---	---	921	933	-64	-0.5314	936	-0.7970	134	1.1159
7	72	55	1,084	120	923	924	921	932	282	2,3380	911	936	-96	-0.7970	912	936	-90	93	0.7705
7	72	55	1,146	127	923	923	921	934	291	2,2869	912	936	-90	-0.7037	912	936	-90	101	0.7916

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: FOSROC DN - 116
Batch id.: Material No. 8

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading Initial (inches)	Bar Reading Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	55	no load	0	921	921	949	590	---	915	1,058	---	---
5	72	55	no load	0	922	922	907	913	833	913	905	-502	195
7	72	55	no load	0	923	924	902	904	838	909	896	-554	142

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: FOSROC DN - 116

Batch Id.: Material No. 8

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Second Cast - 0.4" ft)										Average Strain (millionths)	Average Load Strain (in./in./psi)		
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial		Final		Specimen 1					Specimen 2						
					Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (in./in./psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (in./in./psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (in./in./psi)				
3	68	54	0	0	917	918	932	860	---	---	---	909	931	---	---	---	---			
3	68	54	1,120	124	918	918	951	874	102	0.8229	945	922	83	0.6886	83	0.6886	93	0.7457		
6	68	54	1,120	124	916	916	944	866	67	0.5400	940	916	61	0.4886	61	0.4886	64	0.5143		
13	68	53	1,120	124	923	924	921	932	157	1.2600	911	936	-16	-0.1286	-16	-0.1286	70	0.5657		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: FOSROC DN - 116

Batch Id.: Material No. 8

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Second Cast - Zero Load)						Average Strain (millionths)		
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)		Final (inches)		Specimen 1			Specimen 2			
					Reading 1 (inches)	Reading 2 (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)			
3	68	54	no load	0	917	918	921	912	---	921	919	---	---		
6	68	57	no load	0	916	916	912	912	-19	917	914	-19	-19		
13	68	53	no load	0	907	907	875	873	-205	875	882	-198	-202		
20	68	53	no load	0	907	907	861	859	-294	861	865	-298	-296		
27	69	52	no load	0	907	907	848	846	-378	848	850	-387	-382		
34	71	52	no load	0	907	907	839	837	-435	837	839	-458	-446		
41	70	51	no load	0	907	907	830	828	-493	828	829	-518	-506		
49	71	52	no load	0	907	907	822	820	-544	819	819	-579	-562		
50	72	51	no load	0	907	907	820	818	-557	817	817	-592	-574		
56	71	51	no load	0	906	906	814	811	-592	811	810	-627	-610		
64	71	53	no load	0	906	906	807	805	-634	804	803	-672	-653		
71	72	57	no load	0	907	907	804	802	-659	800	798	-707	-683		
79	71	54	no load	0	905	905	800	802	-659	795	792	-730	-694		
85	70	48	no load	0	907	907	793	789	-736	787	785	-790	-763		
95	71	50	no load	0	901	901	785	782	-746	782	777	-794	-770		
99	67	48	no load	0	902	902	784	782	-755	779	775	-816	-786		
104	69	45	no load	0	902	902	782	780	-768	777	774	-826	-797		
139	66	35	no load	0	901	901	766	763	-867	759	754	-941	-904		
161	70	30	no load	0	902	902	764	761	-886	755	751	-970	-928		
195	70	43	no load	0	901	901	762	759	-893	753	749	-976	-934		
229	64	43	no load	0	901	901	749	747	-973	743	738	-1,043	-1,008		
257	68	53	no load	0	901	901	749	747	-973	742	739	-1,043	-1,008		
293	70	51	no load	0	901	901	750	748	-966	743	741	-1,034	-1,000		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: FOSROC - DN116

Batch Id.: Material No. 8

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Third Cast - 0.2" ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)		
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)		Final (inches)		Specimen 1					Specimen 2						
					Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	70	54	0	0	908	908	922	926	---	---	922	920	---	---	922	920	---	---		
3	70	54	560	62	908	909	926	926	10	0.1543	925	921	10	0.1543	925	921	10	---		
6	71	52	560	62	907	907	919	906	-67	-1.0800	915	900	-80	-1.2857	915	900	-74	-1.1829		
7	72	51	560	62	907	907	917	899	-96	-1.5429	912	893	-112	-1.8000	912	893	-104	-1.6714		
13	71	51	560	62	906	906	907	873	-205	-3.2814	901	877	-192	-3.0857	901	877	-198	-3.1886		
21	71	53	560	62	906	906	895	852	-310	-4.9886	890	857	-291	-4.6800	890	857	-301	-4.8343		
28	72	57	560	62	907	907	890	842	-365	-5.8629	881	848	-355	-5.7086	881	848	-360	-5.7857		
36	71	54	560	62	905	905	882	832	-410	-6.5829	873	837	-403	-6.4800	873	837	-406	-6.5314		
42	70	48	560	62	907	907	874	823	-509	-8.1771	865	828	-470	-7.5600	865	828	-474	-7.6114		
52	71	50	560	62	901	901	863	812	-509	-8.1771	853	817	-506	-8.1257	853	817	-507	-8.1514		
56	67	48	560	62	902	902	859	809	-538	-8.6400	851	816	-522	-8.3829	851	816	-530	-8.5114		
61	69	45	560	62	902	902	855	806	-560	-9.0000	847	811	-550	-8.8457	847	811	-555	-8.9229		
96	66	35	560	62	901	901	831	778	-720	-11.5714	819	783	-723	-11.6229	819	783	-722	-11.5971		
118	70	30	560	62	902	902	827	776	-746	-11.9829	820	782	-730	-11.7257	820	782	-738	-11.8543		
152	70	43	560	62	901	901	823	774	-758	-12.1886	818	780	-736	-11.8286	818	780	-747	-12.0086		
186	64	43	560	62	901	901	809	761	-845	-13.5771	804	770	-826	-13.2686	804	770	-835	-13.4229		
214	68	53	560	62	901	901	809	761	-480	-7.7143	804	771	-822	-13.2171	804	771	-851	-10.4657		
250	70	51	560	62	901	901	808	762	-480	-7.7143	803	767	-838	-13.4743	803	767	-859	-10.5943		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: AMSTONE - MDOT MIX #6
Batch id.: Material No. 9

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - 0.4' ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	72	55	0	0	921	921	907	922	---	---	927	965	---	---	---	---		
3	72	55	929	103	924	923	912	928	19	0.1860	930	971	13	0.1240	930	971		
7	72	55	929	103	920	920	887	903	-118	-1.1470	906	954	-96	-0.9300	906	954		
14	68	55	929	103	919	919	867	887	-227	-2.2011	885	933	-224	-2.1701	885	933		
21	68	55	929	103	917	917	851	865	-336	-3.2551	872	922	-288	-2.7901	872	922		
28	68	54	1,163	129	916	916	841	856	-390	-3.0212	861	914	-342	-2.6497	861	914		
28	68	54	1,163	129	923	918	851	863	-365	-2.8230	868	923	-320	-2.4764	868	923		
35	68	53	1,163	129	907	907	829	842	-416	-3.2193	845	903	-371	-2.8726	845	903		
42	68	53	1,163	129	907	907	822	836	-458	-3.5412	840	896	-410	-3.1697	840	896		
49	69	52	1,163	129	907	907	818	835	-474	-3.6650	835	892	-438	-3.3926	835	892		
56	71	52	1,163	129	907	907	815	829	-502	-3.8879	829	888	-470	-3.6402	829	888		
63	70	51	1,163	129	907	907	812	824	-528	-4.0860	826	884	-493	-3.9498	826	884		
71	70	52	1,163	129	907	907	808	820	-554	-4.2841	823	880	-515	-3.9869	823	880		
96	68	43	1,163	129	904	904	790	802	-650	-5.0270	804	863	-611	-4.7298	804	863		
126	69	45	1,163	129	902	902	787	800	-653	-5.0518	799	859	-627	-4.8537	799	859		
161	66	35	1,163	129	901	901	775	786	-730	-5.6461	783	844	-720	-5.5718	783	844		
183	70	30	1,163	129	902	902	776	788	-726	-5.6213	789	845	-704	-5.4480	789	845		
217	70	43	1,163	129	901	901	782	793	-685	-5.2894	795	852	-656	-5.0765	795	852		
251	64	43	1,163	129	901	901	774	786	-733	-5.6709	788	844	-704	-5.4480	788	844		
279	68	53	1,163	129	901	901	778	791	-704	-5.4480	792	851	-669	-5.1756	792	851		
315	70	51	1,163	129	901	901	779	792	-698	-5.3985	792	852	-666	-5.1504	792	852		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: AMSTONE - MDOT MIX #6

Batch id.: Material No. 9

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	55	no load	0	921	921	949	590	---	915	1,058	---	---
7	72	55	no load	0	920	920	924	570	-138	886	1,024	-195	-166
14	68	55	no load	0	919	919	902	548	-272	865	1,000	-333	-302
21	68	55	no load	0	917	917	896	532	-330	848	981	-435	-382
28	68	54	no load	0	916	916	876	520	-426	836	971	-499	-462
35	68	53	no load	0	907	907	861	505	-464	820	954	-547	-506
42	68	53	no load	0	907	907	856	495	-512	813	947	-592	-552
49	69	52	no load	0	907	907	849	490	-550	807	942	-627	-589
56	71	52	no load	0	907	907	846	487	-570	804	938	-650	-610
63	70	51	no load	0	907	907	840	481	-608	798	931	-691	-650
71	70	52	no load	0	907	907	835	480	-627	793	926	-723	-675
96	68	43	no load	0	904	904	817	457	-739	774	907	-826	-782
126	69	45	no load	0	902	902	809	448	-781	768	900	-854	-818
161	66	35	no load	0	901	901	795	435	-861	754	887	-934	-898
183	70	30	no load	0	902	902	795	435	-867	756	888	-931	-899
217	70	43	no load	0	901	901	798	442	-829	760	892	-899	-864
251	64	43	no load	0	901	901	791	435	-874	753	885	-944	-909
279	68	53	no load	0	901	901	794	434	-867	757	889	-918	-893
315	70	51	no load	0	901	901	796	436	-854	759	892	-902	-878

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO R310

Batch Id.: Material No. 10

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - 0.4" x 1")										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Bar Reading Initial (inches)	Bar Reading Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	72	55	0	0	920	920	927	974	---	---	927	928	---	---	---	---		
3	72	55	1,843	205	920	920	935	985	61	0.2969	940	925	32	0.1563	---	0.2268		
7	68	55	1,843	205	920	920	932	986	54	0.2657	947	931	74	0.3594	---	0.3125		
7	72	55	1,084	120	923	924	921	932	-176	-1.4613	936	938	-48	-0.3985	---	-0.9299		
7	72	55	1,146	127	923	923	921	934	-166	-1.3068	912	936	-42	-0.3267	---	-0.8168		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO R310
Batch id.: Material No. 10

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Initial (inches)	Final (inches)	Specimen 1			Specimen 2			
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	72	55	no load	0	920	920	934	926	---	859	915	---	---
7	68	55	no load	0	920	920	927	919	-45	859	914	-3	-24
7	72	55	no load	0	923	924	902	904	-195	909	896	77	-59

SECOND CAST

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO R310
Batch Id.: Material No. 10

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Second Cast - 0.4" ft)										Average Load Strain (millionths/psi)	Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	68	55	0	0	916	917	1284	924	---	---	926	923	---	---	---	---		
3	68	55	1,843	205	918	918	1290	945	147	0.7188	945	943	115	0.5626	131	0.6407		
7	68	55	1,843	205	920	920	932	986	-886	-4.3286	947	931	70	0.3438	-408	-1.9924		
7	72	55	1,084	120	923	924	921	932	-117	-9.2723	911	936	-51	-0.4251	-584	-4.8487		
7	72	55	1,146	127	923	923	921	934	-1107	-8.6853	912	936	-45	-0.3518	-576	-4.5236		

SECOND CAST

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO R310
Batch Id.: Material No. 10

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Second Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	68	55	no load	0	920	920	1,165	923	---	930	925	---	---
7	68	54	no load	0	916	917	1,167	923	29	926	925	10	19
14	68	53	no load	0	907	907	1,155	910	10	913	911	-16	-3
21	68	53	no load	0	907	907	1,150	906	-19	909	906	-45	-32
28	69	52	no load	0	907	907	1,142	901	-61	905	901	-74	-67
35	71	52	no load	0	908	907	1,143	895	-80	903	900	-86	-83
42	70	51	no load	0	907	907	1,139	890	-106	898	895	-115	-110
50	70	52	no load	0	907	907	1,134	887	-131	893	890	-147	-139
51	71	51	no load	0	907	906	1,132	886	-138	893	889	-147	-142
57	71	51	no load	0	906	906	1,129	882	-157	889	886	-166	-162
65	71	53	no load	0	906	905	1,124	878	-182	885	881	-192	-187
72	71	57	no load	0	907	907	1,120	876	-211	882	879	-218	-214
80	81	54	no load	0	905	905	1,118	874	-211	879	876	-224	-218
86	70	48	no load	0	907	907	1,113	870	-253	876	872	-259	-256
96	71	50	no load	0	901	901	1,105	863	-262	869	865	-266	-264
100	67	48	no load	0	902	902	1,104	861	-278	868	863	-282	-280
105	69	45	no load	0	902	902	1,103	860	-285	866	862	-291	-288
140	66	35	no load	0	901	901	1,085	842	-394	847	844	-403	-398
162	70	30	no load	0	902	902	1,084	840	-410	846	842	-419	-414
196	70	43	no load	0	901	901	1,080	836	-429	841	838	-442	-435
230	64	43	no load	0	901	901	1,060	824	-531	828	825	-525	-528
258	68	53	no load	0	901	901	1,060	819	-547	824	821	-550	-549
294	70	51	no load	0	901	901	1,059	819	-550	824	820	-554	-552

THIRD CAST LOADED TO 0.2 ft

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: MASTER BUILDERS - EMACO R310
Batch id.: Material No. 10

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Third Cast - 0.2 * ft)								Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Initial (inches)	Final (inches)	Specimen 1				Specimen 2					
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)		
3	70	54	0	0	908	908	930	924	---	---	---	---	---	---	---	---
3	70	54	922	102	909	909	932	930	19	0.1874	932	928	26	0.2489	22	0.2187
6	70	52	922	102	907	907	927	928	16	0.1562	930	927	29	0.2811	22	0.2187
7	72	51	922	102	907	906	925	928	6	0.0625	924	924	3	0.0312	5	0.0469
13	71	51	922	102	906	906	917	928	-16	-0.1562	917	920	-29	-0.2811	-22	-0.2187
21	71	53	922	102	906	905	912	919	-58	-0.5623	911	915	-61	-0.5935	-59	-0.5779
28	71	57	922	102	907	907	910	916	-83	-0.8121	909	914	-80	-0.7609	-82	-0.7985
38	71	54	922	102	905	905	907	913	-90	-0.8746	904	910	-86	-0.9371	-93	-0.9059
42	70	48	922	102	907	907	902	908	-134	-1.3119	900	904	-141	-1.3744	-138	-1.3432
52	71	50	922	102	901	901	894	900	-147	-1.4369	891	898	-150	-1.4881	-149	-1.4525
56	67	48	922	102	902	902	893	900	-157	-1.5306	890	896	-166	-1.6243	-162	-1.5774
61	69	45	922	102	902	902	892	900	-160	-1.5618	888	895	-176	-1.7180	-168	-1.6399
96	66	35	922	102	901	901	871	876	-298	-2.9050	871	874	-291	-2.8425	-294	-2.8738
118	70	30	922	102	902	902	869	877	-307	-3.0987	867	875	-307	-2.9987	-307	-2.9987
152	70	43	922	102	901	901	864	874	-326	-3.1861	862	872	-326	-3.1861	-326	-3.1861
186	64	43	922	102	901	901	849	861	-416	-4.0607	847	860	-413	-4.0295	-414	-4.0451
214	68	53	922	102	901	901	843	859	-442	-4.3106	845	857	-429	-4.1857	-435	-4.2482
250	70	51	922	102	901	901	842	855	-458	-4.4668	842	852	-454	-4.4356	-456	-4.4512

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested **MASTER BUILDERS - S66 - CR**

Batch id.: Material No. 11

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - 0.4" ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Bar Reading (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
4	68	55	0	0	921	921	927	735	---	---	906	910	---	---	---	---		
4	68	55	1,213	135	920	921	931	738	26	0.1899	908	925	58	0.4274	908	925	42	0.3087
7	68	55	1,213	135	920	920	915	724	-67	-0.4986	895	901	-58	-0.4274	895	901	-62	-0.4630
7	72	55	1,328	148	920	920	920	724	-51	-0.3470	894	900	-64	-0.4337	894	900	-58	-0.3904
11	68	56	1,328	148	919	919	908	713	-118	-0.8024	884	891	-118	-0.8024	884	891	-118	-0.8024
14	68	56	1,328	148	918	918	902	707	-150	-1.0193	877	886	-150	-1.0193	877	886	-150	-1.0193
21	68	56	1,328	148	917	917	889	702	-202	-1.3663	870	880	-186	-1.2578	870	880	-194	-1.3120
28	68	54	1,328	148	926	917	896	700	-214	-1.4530	880	883	-173	-1.1711	880	883	-194	-1.3120
28	68	54	1,402	156	916	916	887	696	-221	-1.4174	865	873	-218	-1.3969	865	873	-219	-1.4071
29	68	54	1,402	156	908	908	884	688	-205	-1.3147	856	866	-218	-1.3969	856	866	-211	-1.3558
35	68	53	1,402	156	907	907	875	684	-240	-1.5407	852	864	-230	-1.4790	852	864	-235	-1.5098
42	68	54	1,402	156	907	907	876	683	-240	-1.5407	851	861	-243	-1.5612	851	861	-242	-1.5509
50	68	54	1,402	156	908	908	881	683	-230	-1.4790	852	861	-246	-1.5817	852	861	-238	-1.5304
56	71	51	1,402	156	907	907	878	681	-240	-1.5407	848	859	-259	-1.6639	848	859	-250	-1.6023
58	70	51	1,402	156	907	907	878	681	-240	-1.5407	852	857	-253	-1.6228	852	857	-246	-1.5817
58	71	51	1,402	156	905	906	875	674	-262	-1.6845	843	850	-294	-1.8899	843	850	-278	-1.7872
91	68	43	1,402	156	904	905	870	666	-298	-1.9104	837	843	-330	-2.1158	837	843	-314	-2.0131
121	69	45	1,402	156	905	902	861	665	-323	-2.0748	835	842	-333	-2.1364	835	842	-328	-2.1056
156	66	35	1,402	156	901	901	848	655	-381	-2.4445	825	831	-384	-2.4650	825	831	-382	-2.4548
178	70	30	1,402	156	902	902	853	659	-358	-2.3007	827	835	-371	-2.3829	827	835	-365	-2.3418
212	70	43	1,402	156	901	901	859	664	-317	-2.0337	828	839	-349	-2.2391	828	839	-333	-2.1364
246	64	43	1,402	156	901	901	849	656	-374	-2.4034	825	833	-378	-2.4240	825	833	-376	-2.4137
274	68	53	1,402	156	901	901	847	659	-371	-2.3829	826	835	-368	-2.3623	826	835	-370	-2.3726
310	70	51	1,402	156	901	901	851	658	-362	-2.3213	828	836	-358	-2.3007	828	836	-360	-2.3110

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being teste MASTER BUILDERS - S66 - CR

Batch id.: Material No. 11

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
4	68	55	no load	0	921	921	878	929	---	920	927	---	---
7	72	55	no load	0	923	924	902	904	-19	909	896	-150	-85
11	68	56	no load	0	919	919	851	897	-176	895	898	-160	-168
14	68	56	no load	0	918	918	844	890	-214	888	891	-198	-206
21	68	56	no load	0	917	917	836	881	-262	880	883	-243	-253
28	68	54	no load	0	926	917	839	882	-278	880	883	-272	-275
29	68	54	no load	0	908	908	823	865	-298	866	869	-275	-286
35	68	53	no load	0	907	907	819	865	-304	862	864	-298	-301
42	68	54	no load	0	907	907	816	862	-323	860	863	-307	-315
50	68	54	no load	0	908	908	818	863	-320	861	864	-307	-314
56	70	51	no load	0	907	907	813	859	-342	857	860	-326	-334
58	70	51	no load	0	907	907	813	859	-342	857	860	-326	-334
73	71	51	no load	0	905	906	808	853	-368	852	856	-346	-357
91	68	43	no load	0	904	905	799	845	-416	843	847	-397	-406
121	69	45	no load	0	902	902	793	842	-429	841	844	-397	-413
156	66	35	no load	0	901	901	786	834	-470	831	835	-451	-461
178	70	30	no load	0	902	902	788	837	-461	834	838	-438	-450
212	70	43	no load	0	901	901	790	840	-438	837	841	-413	-426
246	64	43	no load	0	901	901	785	834	-474	830	834	-458	-466
274	68	53	no load	0	901	901	785	834	-474	830	834	-458	-466
310	70	51	no load	0	901	901	788	837	-454	832	837	-442	-448

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: Sika - SIKATOP 111

Batch Id.: Material No. 12

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (First Cast - 0.4' ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	68	55	0	0	922	920	941	929	---	---	939	935	---	---	---	---		
3	68	55	1,159	129	920	921	945	939	48	0.3727	947	938	38	0.2982	---	---		
5	72	55	1,084	120	922	922	925	941	-19	-0.1594	921	933	-70	-0.5845	---	---		
7	72	55	1,084	120	923	924	921	932	-70	-0.5845	911	936	-102	-0.8502	---	---		
7	72	55	1,146	127	923	923	921	934	-61	-0.4775	912	936	-96	-0.7539	---	---		

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: Sika - SIKATOP 111
 Batch id.: Material No. 12

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (First Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	68	55	no load	0	922	920	926	934	---	934	933	---	---
5	72	55	no load	0	922	922	907	913	-134	913	905	-163	-149
7	72	55	no load	0	923	924	902	904	-189	909	896	-214	-202

• SECOND CAST

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: Sika - SIKATOP 111

Batch Id.: Material No. 12

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Second Cast - 0.4" ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Bar Reading		Specimen 1					Specimen 2						
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	68	55	0	0	916	915	921	933	48	---	929	929	---	---	---	---		
0	68	55	1,159	129	916	916	929	941	-90	0.3727	934	941	51	0.3976	929	941		
7	68	54	1,159	129	916	919	901	929	-90	-0.6958	876	935	-163	-1.2673	934	935		
7	68	54	2,098	233	917	917	906	933	-58	-0.2471	880	939	-134	-0.5765	880	939		
14	68	52	2,098	233	907	907	893	921	-74	-0.3157	865	929	-150	-0.6452	865	929		
19	68	53	2,098	233	907	907	889	918	-96	-0.4118	863	925	-170	-0.7276	863	925		
21	68	54	2,098	233	907	907	889	918	-93	-0.3981	862	926	-131	-0.5628	862	926		
28	69	52	2,098	233	907	907	881	909	-150	0.6452	852	917	-230	-0.9884	852	917		
29	71	52	2,670	297	907	908	889	918	-99	-0.3344	860	928	-173	-0.5825	860	928		
29	71	52	2,670	297	907	907	889	918	-96	-0.3236								
35	71	52	2,670	297	907	908	886	917	-112	-0.3775								
43	70	51	2,670	297	907	907	883	914	-128	-0.4315								

SECOND CAST

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: SIKA - SIKATOP 111
Batch Id.: Material No. 12

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference		Specimen Comparator Data (Second Cast - Zero Load)						Average Strain (millionths)
	Temp. (deg. F)	Humidity (Rel.Hum.)			Bar Reading		Specimen 1			Specimen 2			
					Initial (inches)	Final (inches)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	
3	68	55	no load	0	916	915	921	887	---	915	911	---	---
7	68	54	no load	0	916	916	916	881	-38	900	908	-61	-50
14	68	52	no load	0	907	907	907	867	-70	886	893	-96	-83
19	68	53	no load	0	907	907	897	863	-99	882	889	-122	-110
21	68	53	no load	0	907	907	899	865	-86	883	890	-115	-101
28	69	51	no load	0	907	908	894	861	-118	879	886	-144	-131
29	71	52	no load	0	907	907	896	863	-102	880	887	-134	-118
35	71	52	no load	0	907	908	892	858	-134	876	883	-163	-149
42	70	51	no load	0	907	907	888	854	-157	873	879	-182	-170
50	70	52	no load	0	907	907	884	850	-182	868	874	-214	-198
51	71	51	no load	0	906	907	882	849	-189	867	873	-218	-203
57	71	51	no load	0	905	905	880	846	-195	864	870	-227	-211
65	71	53	no load	0	905	905	876	843	-218	860	866	-253	-235
72	72	58	no load	0	907	907	874	840	-246	856	862	-291	-269
80	71	54	no load	0	905	905	872	839	-243	854	861	-288	-266
86	70	48	no load	0	907	907	868	834	-285	850	856	-330	-307
96	71	50	no load	0	901	901	861	828	-288	844	849	-333	-310
100	68	48	no load	0	902	902	860	826	-304	842	848	-349	-326
105	69	45	no load	0	902	902	858	827	-307	839	846	-365	-336
140	66	35	no load	0	901	901	843	812	-397	826	831	-448	-422
162	70	30	no load	0	902	902	842	811	-410	825	831	-458	-434
196	70	43	no load	0	901	901	840	810	-413	823	828	-467	-440
230	64	43	no load	0	901	901	829	799	-483	813	819	-528	-506
258	68	53	no load	0	901	901	826	796	-502	810	816	-547	-525
294	70	51	no load	0	901	901	827	796	-499	809	816	-550	-525

THIRD CAST LOADED TO 0.2 FT

TENSILE CREEP TEST (3" X 3" X 12" Prismatic Specimens)

Product being tested: Sika-Sikatop 111

Batch id: Material No. 12

Specimen Age (days)	Storage Conditions		Load (lb)	Stress (psi)	Reference Bar Reading		Specimen Comparator Data (Third Cast - 0.2" ft)										Average Strain (millionths)	Average Load Strain (millionths/psi)
	Temp. (deg. F)	Humidity (Rel. Hum.)			Initial (inches)	Final (inches)	Specimen 1					Specimen 2						
							Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)	Reading 1 (inches)	Reading 2 (inches)	Strain (millionths)	Load Strain (millionths/psi)				
3	70	54	0	0	910	908	879	913	10	0.1490	922	923	10	0.1490	922	923	10	0.1490
3	70	54	580	64	909	909	882	913	10	0.1490	925	923	10	0.1490	925	923	10	0.1490
6	70	52	580	64	907	907	875	906	-22	-0.3476	916	913	-38	-0.5959	916	913	-30	-0.4717
7	71	51	580	64	906	906	873	904	-29	-0.4469	914	911	-45	-0.6952	914	911	-37	-0.5710
7	71	51	1,049	117	906	905	874	905	-19	-0.1647	915	912	-35	-0.3020	915	912	-27	-0.2334
13	71	51	1,049	117	905	905	864	897	-74	-0.6315	908	908	-67	-0.5765	908	908	-70	-0.6040
21	71	53	1,049	117	905	905	856	892	-115	-0.9884	901	901	-112	-0.9609	901	901	-114	-0.9746
28	72	58	1,049	117	907	907	850	887	-163	-1.4002	897	897	-150	-1.2904	897	897	-157	-1.3453
28	72	58	1,335	148	907	907	853	890	-144	-0.9708	899	899	-138	-0.9276	899	899	-141	-0.9492
36	71	54	1,335	148	905	905	850	888	-147	-0.9924	895	895	-150	-1.0139	895	895	-149	-1.0031
42	70	48	1,335	148	907	907	845	882	-195	-1.3160	891	890	-192	-1.2844	891	890	-194	-1.3052
52	71	50	1,335	148	901	901	839	875	-198	-1.3375	883	883	-202	-1.3591	883	883	-200	-1.3483
56	68	48	1,335	148	902	902	836	873	-221	-1.4885	882	879	-224	-1.5101	882	879	-222	-1.4993
61	69	45	1,335	148	902	902	834	872	-230	-1.5533	880	882	-221	-1.4885	880	882	-226	-1.5209
96	66	35	1,335	148	901	901	820	856	-320	-2.1573	863	863	-330	-2.2220	863	863	-325	-2.1897
118	70	30	1,335	148	902	902	820	855	-330	-2.2220	863	862	-339	-2.2867	863	862	-334	-2.2544
152	70	43	1,335	148	901	901	818	853	-336	-2.2652	860	861	-346	-2.3289	860	861	-341	-2.2975
186	64	43	1,335	148	901	901	807	841	-410	-2.7613	850	849	-416	-2.8045	850	849	-413	-2.7629
214	68	53	1,335	148	901	901	806	838	-422	-2.8476	848	848	-426	-2.8692	848	848	-424	-2.8584
250	70	51	1,335	148	901	901	805	838	-426	-2.8692	844	846	-445	-2.9987	844	846	-435	-2.9339

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE April 1998	3. REPORT TYPE AND DATES COVERED Final report	
4. TITLE AND SUBTITLE Performance Criteria for Concrete Repair Materials, Phase II Laboratory Results			5. FUNDING NUMBERS Work Unit 32637	
6. AUTHOR(S) Randall W. Poston, Keith E. Kesner, Peter H. Emmons, Alexander M. Vaysburd				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Whitlock Dalrymple Poston & Associates, Inc., 8832 Rixlew Lane, Manassas, VA 20109; Structural Preservation Systems, Inc., 3761 Commerce Drive, Suite 414, Baltimore, MD 21227			8. PERFORMING ORGANIZATION REPORT NUMBER Technical Report REMR-CS-57	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Corps of Engineers, Washington, DC 20314-1000, U.S. Army Engineer Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The study reported herein is part of an overall investigation to develop performance criteria for cement-based repair materials. In Phase I of the study, preliminary criteria for dimensionally compatible repair materials were developed based on a review of the literature. This review concentrated on identifying pertinent material properties, appropriate test methods, and demonstrated field performance. Laboratory and field tests to evaluate the preliminary performance criteria were conducted in Phase II of the project. Twelve candidate repair materials were selected for the experimental portion of the project. Each material was subjected to a series of standard and nonstandard laboratory tests to determine properties which were perceived to be of interest in a repair context and to provide some basic information about their behavior. These tests included: (a) unrestrained and restrained drying shrinkage, (b) modulus of elasticity, (c) tensile and compressive creep, (d) coefficient of thermal expansion, and (e) flexural, compressive, and direct tensile strengths. Concurrent field tests were also conducted to evaluate material durability. Results of the laboratory investigation are described herein. Results of laboratory and field performance tests will be correlated (Phase III) to provide a basis for development of performance criteria for cement-based materials that will provide durable concrete repairs.				
14. SUBJECT TERMS Coefficient of thermal expansion Drying shrinkage (unrestrained) Repair Compressive creep Material properties Repair materials Concrete structures Modulus of elasticity Tensile creep Drying shrinkage (restrained) Performance criteria Tensile strength			15. NUMBER OF PAGES 299	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT	