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AD-744 050

SEALS

A DDC BIBLIOGRAPHY

DDC-TAS-72-44

JUNE 1972

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d.			
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13. ABSTRACT This bibliography is a compilation of references on Seals. Some of the topics covered are: Development of seals for advanced-design-launching system, basic research in dynamic sealing, bearing and seal technology review, fluid seals for high-speed rotating equipment, dynamic shaft seals in space, hermetic seals in plastic bodied connectors, gasketing media at ultra-high pressure, study of O-Ring aging characteristics, and a vacuum seal for non-circular tubes. References are sequenced numerically within each of the following topics: Fuel & Gas Seals; Gaskets; Glass Seals; Hermetic & Hydraulic Seals; Metal Seals; Oil Seals and O-Rings; Plastic & Vacuum Seals; Rotary Seals; and Rubber Seals. Corporate Author-Monitoring Agency, Subject, Title, Personal Author, and AD Number Indexes are provided.			

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*Bibliographies *Seals *Fuel Seals Gas Seals Gaskets Hydraulic Seals Oil Seals Plastic Seals Rubber Seals Manufacturing Methods Composite Materials Sealing Compounds O-Rings Glass Seals Hermetic Seals Metal Seals Vacuum Seals Rotary Seals High-Pressure Research Sealants Seals(Stoppers) Adhesives Bearings Elastomers Fuel Tanks Halocarbon Plastics Electron Tubes Ceramic Materials						
<i>11</i>						

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June 1955 - January 1972

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III

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FOREWORD

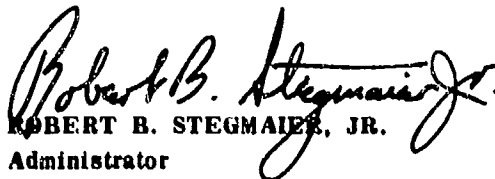
This bibliography is a compilation of references on *Seals* which were selected from entries processed into the Defense Documentation Centers data bank during the period of January 1953 through April 1972 and supersedes AD-706 000.

References are sequenced numerically within each of the following topics: I. Fuel and Gas Seals, II. Gaskets, III. Glass Seals. IV. Hermetic and Hydraulic Seals, V. Metal Seals, VI. Oil Seals and O-Rings, VII. Plastic and Vacuum Seals, VIII. Rotary Seals and IX. Rubber Seals.

Corporate Author-Monitoring Agency, Subject, Title, Personal Author, and AD Number Indexes are provided.

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Administrator
Defense Documentation Center

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C O N T E N T S

	<u>Page</u>
FOREWORD.....	iii
AD BIBLIOGRAPHIC REFERENCES	
I. FUEL AND GAS SEALS.....	1
II. GASKETS.....	13
III. GLASS SEALS.....	33
IV. HERMETIC AND HYDRAULIC SEALS.....	45
V. METAL SEALS.....	65
VI. OIL SEALS AND O-RINGS.....	93
VII. PLASTIC AND VACUUM SEALS.....	111
VIII. ROTARY SEALS.....	129
IX. RUBBER SEALS.....	151
INDEXES	
CORPORATE AUTHOR-MONITORING AGENCY.....	0-1
SUBJECT.....	D-1
TITLE.....	T-1
PERSONAL AUTHOR.....	P-1
AD NUMBER.....	A-1

I. FUEL AND GAS SEALS

VI

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-239 509

WATERVLJET ARSENAL N Y

ANALYTIC DEVELOPMENT OF DESIRABLE STRESS DISTRIBUTION
CHARACTERISTICS IN SEALING RINGS LEADING TO
RECOMMENDATION OF RING NO. 5 FOR APPLICATION TO
CLOSED BREACH LAUNCHERS (U)

MAR 60 1V SADOWSKY, M.A.:

REPT. NO. RR6006

PROJ: 5W45 07 034 01

UNCLASSIFIED REPORT

DESCRIPTORS: *GAS SEALS, *GUNS, DESIGN, MATHEMATICAL
ANALYSIS, RINGS, SEALS (STOPPERS), STRESSES, TESTS (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-286 232

GENERAL DYNAMICS/FORT WORTH TEX

WING AND FUSELAGE - INTEGRAL FUEL TANK SEALANTS -
IMPROVED HIGH TEMPERATURE (275 F) - PER MIL-S-8802 -
EVALUATION OF, (U)

JUN 62 1V PRICE, H.M.:
REPT. NO. FGT 1631
CONTRACT: AF 33(600)-32841, AF 33(657)-7248

UNCLASSIFIED REPORT

DESCRIPTORS: *FUEL SEALS, *FUEL TANKS, *HIGH-TEMPERATURE
RESEARCH, *SEALING COMPOUNDS, ADHESION, ELASTICITY,
HEAT-RESISTANT PLASTICS, JET BOMBERS, TESTS, THERMAL
STRESSES (U)
IDENTIFIERS: B-58 AIRCRAFT (U)

SIX SEALANTS WERE SUBMITTED FOR EVALUATION PER
MIL-S-8802, THE PROPOSED HIGH TEMPERATURE (275
F) SEALANT SPECIFICATION. SEALANTS 3C-1177 AND
3C-1055 WERE LACKING IN ADHESION AND ELONGATION
PROPERTIES. SEALANT EC-1610 TESTS SHOWED IT TO
BE A LONG WORK LIFE, HIGH FLOW, LOW STRENGTH MATERIAL
POSSESSING EXCELLENT ADHESION, HIGH TEMPERATURE, AND
FUEL RESISTANT PROPERTIES. I-222 HAD VERY GOOD HIGH
TEMPERATURE RESISTANCE IN THE THERMAL SHOCK, THERMAL
EXTRUSION, AND THERMAL RUPTURE TESTS, BUT LACKED THE
APPLICATION AND ADHESION PROPERTIES REQUIRED BY THE
SPECIFICATION. SEALANT PR-1422 HAD THE BEST ALL-
AROUND FUEL AND HIGH TEMPERATURE PROPERTIES. PR-
1422 WA. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-286 237

GENERAL DYNAMICS/FORT WORTH TEX

MATERIAL - THIOKOL 'ST' RUBBER - PREFABRICATED FILLETS
- FOR INTEGRAL FUEL TANK SEALING - TESTING OF (U)

JUN 62 IV HOFFMAN, H.C.:

REPT. NO. FGT 1468

CONTRACT: AF 33(038)-21250, AF 33(657)-7248

UNCLASSIFIED REPORT

DESCRIPTORS: *FUEL SEALS, *SYNTHETIC RUBBER, AIRPLANES,
CORROSION, DENSITY, ELASTICITY, FLUID FLOW, FUEL TANKS,
HARDNESS, PHYSICAL PROPERTIES, SEA WATER, TENSILE
PROPERTIES, TESTS (U)

ALL TESTING WAS DONE USING PREFABRICATED THIOKOL
'ST' FILLETS. THE TESTS WERE RUN IN ACCORDANCE
WITH THE PROCEDURES OF CONVAIR SPECIFICATION
FMS-0034 WHICH INCLUDED TESTS FOR SPECIFIC GRAVITY,
LINEAR THERMAL CHANGE, PEEL STRENGTH, FLEXIBILITY,
HARDNESS, TENSILE STRENGTH AND ELONGATION, FLUID
RESISTANCE, CORROSIVE ACTION, AND THERMAL FLOW.
EACH OF THE ABOVE LISTED PROPERTIES WAS OBTAINED ON
IMMEL PREFABRICATED FILLETS AND IS BELIEVED TO BE
REPRESENTATIVE OF WHAT MAY BE EXPECTED OF THIOKOL
'ST' FILLETS. BASED ON THE RESULTS OF THESE
TESTS, VALUES HAVE BEEN RECOMMENDED FOR A PROPOSED
NEW PROCUREMENT SPECIFICATION. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-286 937

ARMY MEDICAL RESEARCH LAB FORT KNOX KY

THE DIFFERENTIATION OF AN AVOIDANCE RESPONSE FROM AN
ESCAPE RESPONSE: A NOTE AND CIRCUIT (U)

AUG 62 4P CADWALLADER, T.C.; HARKER, G.S.;
REPT. NO. USAMRL-546
PROJ: DA-6-X-9525001

UNCLASSIFIED REPORT

DESCRIPTORS: •LEARNING, •REACTION (PSYCHOLOGY),
•REFLEXES, CONDITIONED REFLEX, LABORATORY ANIMALS, SHOCK
THERAPY, STIMULATION, TEST EQUIPMENT, TIMING
CIRCUITS (U)

THE LOGIC OF AND A CIRCUIT FOR DIFFERENTIATING AN
AVOIDANCE RESPONSE FROM AN ESCAPE RESPONSE ARE
DESCRIBED. IN AVOIDANCE CONDITIONING EXPERIMENTS
TWO PROCEDURES ARE COMMONLY USED TO DISTINGUISH
BETWEEN AVOIDANCE AND ESCAPE RESPONSES. HOWEVER,
UNDER CERTAIN CONDITIONS THESE PROCEDURES ARE
UNRELIABLE WHEN ELECTRICAL SHOCK IS USED AS THE
UNCONDITIONED STIMULUS. AN ELECTRONIC GATE WAS
DEVELOPED WHICH, IN COMBINATION WITH AN ELECTRONIC
TIMER, TIMES THE DURATION OF SHOCK WHICH AN ANIMAL
ACTUALLY RECEIVES. BY NOTING THE PRESENCE OR
ABSENCE OF SHOCK, IT IS POSSIBLE TO DIFFERENTIATE AN
ESCAPE RESPONSE FROM AN AVOIDANCE RESPONSE.
TECHNIQUES TO DISTINGUISH ACCURATELY AN ESCAPE
RESPONSE FROM AN AVOIDANCE RESPONSE BY AN ELECTRONIC
GATE AND TIMER ARE PRESENTED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-289 074

GENERAL DYNAMICS/FORT WORTH TEX

ENGINEERING RESEARCH - SEALING - METAL-FIBER
COMPOSITE - EVALUATION OF

(U)

DEC 61 IV CARROLL, M.T.; PRITCHARD, D.J.;
REPT. NO. ERR FW 121
CONTRACT: AF33 657 7248

UNCLASSIFIED REPORT

DESCRIPTORS: *FUEL SEALS, *FUEL TANKS, *SEALS
(STOPPERS), COMPOSITE MATERIALS, FAILURE (MECHANICS),
IMPREGNATION, PLATING, PRESSURE, REENTRY VEHICLES,
SILVER

(U)

A SILVER IMPREGNATED METAL-FIBER COMPOSITE SEAL WAS
RECEIVED FOR TESTING AS A FUEL SEAL IN THE
TEMPERATURE RANGE OF -100 F TO +1200 F. THE
SEAL WAS A FLAT CIRCULAR GASKET 8 1/4 IN. IN
DIAMETER AND .031 IN. THICK. SEALING PROPERTIES AT
ROOM TEMPERATURE WERE DETERMINED BY INSTALLING THE
SEAL BETWEEN THE MATING SURFACES OF A STEEL TEST TANK
AND APPLYING INTERNAL PRESSURES FROM 5 TO 30 PSI.
AN AIR TIGHT SEAL AT ROOM TEMPERATURE COULD NOT BE
OBTAINED WITH THIS COMPOSITE FIBER-METAL SEAL.
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-607 240

MONSANTO RESEARCH CORP DAYTON OHIO

EVALUATION OF ELASTOMERS AS O-RING SEALS FOR LIQUID
ROCKET FUEL AND OXIDIZER SYSTEMS. (U)

DESCRIPTIVE NOTE: REPT. FOR MAR 63-MAR 64,
AUG 64 102P BELLANCA, CARMEN L. ;SALYER,
IVAL O. HARRIS, JAY C. I
CONTRACT: AF33 616 8483
PROJ: 7381
TASK: 738103
MONITOR: ASD , TDR63 496 P2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•FUEL SEALS, LIQUID ROCKET FUELS),
(•ELASTOMERS, O-RINGS), (•O-RINGS, FUEL SEALS),
POLYETHYLENE PLASTICS, HALOCARBON PLASTICS, BUTYL
RUBBER, SILICONES, PLASTICS, CLADDING, ENCAPSULATION,
METAL COATINGS, LIQUID ROCKET OXIDIZERS, DEGRADATION,
TEST METHODS, ROCKET PROPELLANTS, OXIDATION, PERFORMANCE
(ENGINEERING), FUEL SYSTEMS, NITROGEN COMPOUNDS, OXIDES,
HYDRAZINE, HYDROGEN PEROXIDE, CHLORINE TRIFLUORIDE (U)

O-RING SEALS OF SELECTED ELASTOMERIC AND COMPLIANT
MATERIALS WERE EVALUATED FOR RESISTANCE TO LIQUID
ROCKET FUELS IN A SIMULATED END-USE TEST. THE
CANDIDATE ELASTOMERS WERE PLACED UNDER COMPRESSION IN
CLOSED CELLS AND EXPOSED TO THE LIQUID AND VAPOR OF
LIQUID ROCKET FUELS AND OXIDIZERS FOR EXTENDED
PERIODS OF TIME. RATE OF FUEL LOSS THROUGH THE
SEAL, AND THE CHANGE IN PHYSICAL PROPERTIES OF THE
SEAL MATERIALS WERE DETERMINED. NITROGEN
TETROXIDE, MIXED HYDRAZINES, CHLORINE TRIFLUORIDE,
90% HYDROGEN PEROXIDE, HYBALINE A-5, AND
PENTABORANE WERE TESTED IN DIRECT CONTACT WITH THE
O-RING SEALS AT 73F. METAL CLAD AND
POLYETHYLENE ENCAPSULATED ELASTOMETRIC O-RINGS WERE
ALSO TESTED FOR RESISTANCE TO NITROGEN TETROXIDE AT
73F. THE EFFECT OF TEMPERATURE ON ELASTOMER
ENDURANCE WAS DETERMINED BY EXPOSING THE O-RINGS TO
NITROGEN TETROXIDE, MIXED HYDRAZINES, AND HYDROGEN
PEROXIDE AT 160F. THE EFFECT OF DIRECT IMMERSION
IN LIQUID ROCKET FUEL ON THE PHYSICAL PROPERTIES OF
THE SEAL MATERIALS WAS INVESTIGATED BY IMMERSING
PROMISING O-RING CANDIDATES IN NITROGEN TETROXIDE,
HYDROGEN PEROXIDE, AND MIXED HYDRAZINE. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-658 204 6/17 11/1 13/5
NORTHROP SPACE LABS HANFORD CALIF

PRESSURE SEALING CLOSURES FOR FULL PRESSURE
PROTECTIVE SUIT ASSEMBLIES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 15 JUL 66-10 FEB 67,
JUN 67 62P HEITZ, ROGER M. ; BROWN, GARY

G. I
REPT. NO. NSL-67-177
CONTRACT: AF 33(615)-5372
PROJ: AF-7164
TASK: 716411
MONITOR: AMRL TR-67-59

UNCLASSIFIED REPORT

DESCRIPTORS: (*PRESSURE SUITS, *FASTENINGS),
(*GAS SEALS, PRESSURE SUITS), DESIGN,
MANUFACTURING METHODS, MOLDING (U)

LONGITUDINAL AND CIRCULAR PRESSURE SEALING CLOSURES
WERE DESIGNED AND DEVELOPED FOR FULL PRESSURE
PROTECTIVE ASSEMBLIES FROM A DESIGN CONCEPT PROVIDED
BY THE AEROSPACE MEDICAL RESEARCH
LABORATORIES, INVENTION DISCLOSURE NUMBER 66/588.
THIS STUDY CONSISTED OF (1) DESIGNING PRESSURE
CLOSURE DEVICES, (2) SELECTING SUITABLE MATERIALS
FOR THE FABRICATION OF THE SEALING CLOSURE PARTS AND
THE CYLINDERS TO INCLUDE THE CLOSURES, (3)
SELECTING AN APPROPRIATE FABRICATION PROCESS FOR THE
CLOSURE SEALING PARTS, AND (4) FABRICATING AND
TESTING THE BREADBOARD AND DEMONSTRATION MODELS
CONTAINING EITHER THE CIRCULAR OR LONGITUDINAL
CLOSURES. AN EPDM ELASTOMERIC MATERIAL WAS FOUND
TO BE SUITABLE FOR THE FABRICATION OF THE CLOSURE
SEALING PARTS WHICH WERE MOLDED USING AN ESTABLISHED
MOLDING TECHNIQUE. THE FABRICATED BREADBOARD AND
DEMONSTRATION MODELS PASSED SUCCESSFULLY THE REQUIRED
TESTS WHEREIN LEAK RATES WERE DETERMINED FROM 0 TO 5
PSIG, AND EXPOSURE TO PRESSURE UP TO 12 PSIG, WERE
PERFORMED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-699 291 11/1 13/9
TENNESSEE UNIV KNOXVILLE DEPT OF MECHANICAL AND AEROSPACE
ENGINEERING

VISCO-TYPE GAS SEALING, (U)

W. ; 69 SP HODGSON, J. W. ; HILLIGAN, M.
CONTRACT: N00014-68-A-0144

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN PROCEEDINGS OF THE
INTERNATIONAL CONFERENCE ON FLUID SEALING (4TH)
HELD IN CONJUNCTION WITH THE 1969 ASLE ANNUAL MEETING,
PHILADELPHIA, PA. P83-87 1969.

DESCRIPTORS: (*SHAFTS, ROTARY SEALS), (*GAS
SEALS, PERFORMANCE(ENGINEERING)), GAS BEARINGS,
VISCOSITY, LAMINAR FLOW, MATHEMATICAL PREDICTION,
CONTINUUM MECHANICS (U)
IDENTIFIERS: GAS VISCOSEALS, SHAFT VISCOSEALS,
*VISCOSEALS (U)

THE PERFORMANCE OF VISCO-TYPE GAS SEALS OPERATING
IN THE CONTINUUM FLOW REGIME HAS BEEN INVESTIGATED
BOTH EXPERIMENTALLY AND ANALYTICALLY. EXPERIMENTAL
VALUES OF THE SEALING COEFFICIENT AGREE WITH A
LAMINAR FLOW ANALYSIS WITHIN EXPERIMENTAL ERROR
(10%). (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-699 315 14/2

BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

COMPRESSOR AIR SEAL FAILURE, SUPERSONIC WIND
TUNNELS, ABERDEEN PROVING GROUND, MARYLAND, 20
MAY 1969.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
OCT 69 27P REKLIS, ERNEST P. ;
REPT. NO. BRL-TN-1724
PROJ: RDT/E-1-T-262301-A-201

UNCLASSIFIED REPORT.

DESCRIPTORS: (*SUPERSONIC WIND TUNNELS, *CENTRIFUGAL
COMPRESSORS), (*GAS SEALS,
FAILURE(MECHANICS)), OILS, LEAKAGE(FLUID),
OPERATION, CLEANING, CONTAMINATION

(U)

ON 20 MAY 1969 IN COMPRESSOR PLANT NO. 1 OF
THE SUPERSONIC WIND TUNNELS, EXTERIOR
BALLISTICS LABORATORY, A STOPPAGE OF AIR FLOW
THROUGH THE LABYRINTH SEALS OF THE CENTRIFUGAL AIR
COMPRESSORS CAUSED ABOUT 20 GALLONS OF LUBRICATING
OIL TO BE DRAWN INTO THE COMPRESSORS AND MAIN AIR
PIPING SYSTEM USED IN THE OPERATION OF THE SUPERSONIC
WIND TUNNELS. AIR SEAL OPERATION, THE OIL PROBLEM
AND CLEAN-UP ARE DISCUSSED. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-730 361 11/1 21/5
CURTISS-WRIGHT CORP WOOD-RIDGE N J

STATIC AND ROTATING AIR/GAS SEAL
EVALUATION.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 71 170P PALADINI, W. ;
REPT. NO. CW-WR-70-024F
CONTRACT: DAAJ02-70-C-0024
PROJ: DA-IG-162204-A-014
TASK: IG-162204-A-01409
MONITOR: USAAMRDL TH-71-28

UNCLASSIFIED REPORT

DESCRIPTORS: (*GAS SEALS, LEAKAGE(FLUID)),
(*GAS TURBINES, GAS SEALS), ROTARY SEALS, O-
RINGS, METAL SEALS, CENTRIFUGAL COMPRESSORS,
AXIAL-FLOW COMPRESSORS, COMPRESSOR PARTS,
MECHANICAL DRAWINGS
IDENTIFIERS: LABYRINTH SEALS

(U)

(U)

THE REPORT DESCRIBES AN EVALUATION OF THE LEAKAGE CHARACTERISTICS OF CURRENT GAS TURBINE ENGINE AIR/GAS SEALS AND SEALING SURFACES OF SMALL GAS TURBINE ENGINES. THE EVALUATION INCLUDED DEFINITION OF PROBABLE AIR/GAS LEAKAGE SOURCES AND PATHS IN AN ENGINE POSSESSING VARIABLE COMPRESSOR AND POWER TURBINE STATOR GEOMETRY, IDENTIFICATION OF SEALING CONCEPTS CURRENTLY IN USE, PREDICTION OF SEAL LEAKAGE IN THE SMALL ENGINE, RIG TESTING OF SEVERAL STATIC AND ROTATING SEALS, AND ANALYSIS OF THE EFFECT OF LEAKAGE ON SMALL ENGINE PERFORMANCE. THE ROTATING SHAFT SEAL TESTS WERE CONDUCTED ON A FIN-TO-FIN LABYRINTH SEAL AND A CARBON FACE CONTACT SEAL. THE CASING FLANGE SEAL TESTS WERE CONDUCTED ON METAL-TO-METAL SURFACES AND ON FOUR METAL SEALS FOR FLANGES. THE VARIABLE-GEOMETRY VANE TRUNNION SEAL TESTS WERE CONDUCTED ON A FLUOROCARBON BUSHING AND A METAL BUSHING FOR THE COMPRESSOR AND POWER TURBINE LOCATIONS, RESPECTIVELY. TESTING INCLUDED LEAKAGE CALIBRATIONS, AND THERMAL CYCLIC AND MECHANICAL CYCLIC OPERATION. (AUTHOR)

(U)

II. GASKETS

12

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZANL5

AD- 55 228

NAVAL ORDNANCE LAB WHITE OAK MD

AN EVALUATION OF THE PERFORMANCE OF GAS CHECK GASKETS
FOR NAVAL PROJECTILES (U)

JAN 55 IV MICKEVICZ, E.J.; CHATHAM, T.K.;
MONITOR: NAVORD 3893

UNCLASSIFIED REPORT

DESCRIPTORS: •GASKETS; •HIGH EXPLOSIVE AMMUNITION;
•PROJECTILES; •SAFETY DEVICES, EXPLOSIVE MATERIALS,
SEALS (STOPPERS), TESTS (M)
IDENTIFIERS: MARK-49 CARTRIDGES, 5-IN. (M)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-236 837

ROCK ISLAND ARSENAL ILL

INVESTIGATION OF HYDROPNEUMATIC RECOIL MECHANISM
PACKING SPRING LOADS

(U)

APR 60 IV RAISBECK, L.R.;

UNCLASSIFIED REPORT

DESCRIPTORS: *GASKETS, *HOWITZERS, *HYDRAULIC SEALS,
*PNEUMATIC DEVICES, *RECOIL MECHANISMS, *SEALS
(STOPPERS), *SPRINGS, EFFECTIVENESS, PISTONS,
TEMPERATURE, TESTS

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZANL5

AD-256 218

PORTSMOUTH NAVAL SHIPYARD N H MATERIALS TESTING LAB

DEVELOPMENT OF SYNTHETIC RUBBER MATERIAL FOR GASKETS
AND PACKINGS IN DEEP SUBMERGENCE SUB-MARINES (U)

MAR 61 IV SWIFT, BILLY H.; DOWNS, FREDERICK L.;

UNCLASSIFIED REPORT

DESCRIPTORS: *GASKETS; *RUBBER GASKETS; *SYNTHETIC
RUBBER, ELASTOMERS, NITRILE RUBBER, PRESSURE, RUBBER,
SUBMARINES, TESTS (U)

A TOTAL OF 9 RUBBER STOCKS WERE TESTED TO DETERMINE
THEIR VARIOUS PHYSICAL PROPERTIES PERTINENT TO THE
FUNCTION OF GASKET MATERIAL FOR DEEP SUBMERGENCE
SUBMARINES. OF THESE 9 STOCKS, 5 WERE FORMULATIONS
ALREADY AVAILABLE, AND THE OTHER 4 STOCKS WERE
FORMULATIONS DEVELOPED IN THE LABORATORY. AN
ANALYSIS OF TEST DATA COMPILED AT THIS TIME INDICATES
THAT ONE OF THE STOCKS ALREADY AVAILABLE AND 2 OF THE
NEWLY DEVELOPED STOCKS SHOULD BE PUT THROUGH A
PRESSURE CELL, OR SIMULATED SERVICE TEST FOR
EVALUATION AS DEEP SUBMERGENCE GASKET MATERIAL.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-258 893

COAST GUARD WASHINGTON D C

TESTS OF PARKER RING SEAL FOR BUOY POCKETS

(U)

JUN 61 IV
REPT. NO. 242

UNCLASSIFIED REPORT

DESCRIPTORS: •BUOYS; •GASKETS; •METAL SEALS; •RUBBER
GASKETS; •RUBBER SEALS; •SEALS (STOPPERS); ALUMINUM;
DESIGN, RINGS, TESTS

(U)

TESTS WERE CONDUCTED TO DETERMINE THE SUITABILITY
OF A PARKER RING SEAL FOR USE AS A CLOSURE
GASKET IN BUOY POCKETS. THE GASKET ASSEMBLY
CONSISTS OF AN ALUMINUM FLAT RING HAVING A 24-INCH
I. D. AND 30-1/2-INCH O. D. WITH A NEOPRENE
RUBBER RING INSERT. THE RING SEAL WAS INSTALLED
IN A MOCK-UP BUOY POCKET AND AIR TESTED TO ONE
ATMOSPHERE. FIRE HOSE AND WATER SUBMERGENCE TESTS
WERE ALSO PERFORMED. IT WAS CONCLUDED THAT THE
PARKER RING SEAL GASKET WAS ADEQUATE FOR USE IN
COAST GUARD BUOY POCKETS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-263 306

NAVAL AIR ENGINEERING CENTER PHILADELPHIA PA AERONAUTICAL
MATERIALS LAB

QUALIFICATION TEST REPORT ON DODGE CORK COMPANY'S
711-BN AND 100-N GASKET MATERIALS TESTED IN
ACCORDANCE WITH MIL-G-6182, AMENDMENT-4, GASKETS AND
SHEET GASKET MATERIAL; SYNTHETIC RUBBER AND CORK
COMPOSITION. CLASS I. FIRM; AND CLASS II. MEDIUM,
RESPECTIVELY OF 22 AUGUST 1947 (U)

DEC 60 1V COLACCICO, E.J.;
REPT. NO. 22090 61

UNCLASSIFIED REPORT

DESCRIPTORS: *GASKETS, MATERIALS, MILITARY REQUIREMENTS,
SEALS (STOPPERS), SHEETS, SYNTHETIC RUBBER, TESTS (U)

TEST DATA INDICATED THAT DODGE CORK COMPANY'S
SHEET GASKET MATERIALS 711-BN AND 100-N CONFORM
WITH ALL THE QUALIFICATION REQUIREMENTS OF MILITARY
SPECIFICATION MIL-G-6182, AMENDMENT-4,
CLASS I, FIRM; AND CLASS II, MEDIUM,
RESPECTIVELY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-265 555

PORTSMOUTH NAVAL SHIPYARD N H MATERIALS TESTING LAB

DEVELOPMENT OF SYNTHETIC RUBBER MATERIAL FOR GASKETS
AND PACKINGS IN DEEP SUBMERGENCE SUBMARINES (U)

IV SWIFT, BILLY H.;

UNCLASSIFIED REPORT

DESCRIPTORS: *GASKETS; *RUBBER GASKETS; *SYNTHETIC
RUBBER; DESIGN; ELASTOMERS; NITRILE RUBBER; PROBABILITY;
SUBMARINES; TEST METHODS; TESTS; UNDERWATER (U)

A SECOND PHASE IN THE DEVELOPMENT OF DEEP SUBMERGENCE
GASKET MATERIAL HAS BEEN COMPLETED. THREE RUBBER
STOCKS, SELECTED ON THE BASIS OF TESTS DESCRIBED IN
PROGRESS REPORT NO. 1, HAVE NOW BEEN EVALUATED
IN A HIGH-PRESSURE TEST TANK. ONE OF THE STOCKS
PERFORMED SATISFACTORILY IN ALL ASPECTS, BUT MAY BE
TOO HIGH IN HARDNESS FOR CERTAIN APPLICATIONS. A
LARGE PART OF THE PROJECT IS NEARLY COMPLETE. A
GROUP OF SEVEN STOCKS IN THE 60-80 DUROMETER
HARDNESS RANGE ARE BEING TESTED IN THE LABORATORY,
AND CURRENT DATA INDICATE THAT AT LEAST TWO OF THEM
SHOULD BE EVALUATED IN THE PRESSURE TEST TANK AS
CANDIDATE MATERIALS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZANL5

AD-285 966

NAVAL APPLIED SCIENCE LAB BROOKLYN N Y

COMPOUNDING DEVELOPMENT OF ELASTOMERS FOR GASKETS FOR
SUBMARINE HIGH PRESSURE AIR AND OXYGEN SYSTEMS (U)

SEP 62 IV HESS, L. G.; HANOK, M.;
REPT. NO. 6172 2

UNCLASSIFIED REPORT

DESCRIPTORS: •ELASTOMERS, •GASKETS, •SYNTHETIC RUBBER,
AIR, CARBON BLACK, DIFFUSION, ESTERS, GASES, HIGH-
PRESSURE RESEARCH, MATERIALS, OXYGEN, PHOSPHATES,
PHYSICAL PROPERTIES, POLYMERS, RUBBER, STRESSES,
SUBMARINES (U)

DEVELOPMENT OF ELASTOMER MATERIALS FOR GASKETS TO BE USED
IN SUBMARINE HIGH PRESSURE AIR AND O2 SYSTEMS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAMLS

AD-288 256

OKLAHOMA STATE UNIV STILLWATER SCHOOL OF MECHANICAL
ENGINEERING

A CONTINUATION OF THE STUDY IN THE FIELD OF FLUID
SEALS FOR HIGH-SPEED ROTATING EQUIPMENT (U)

DESCRIPTIVE NOTE: REPT. NO. 2, 1 SEP 59-31 AUG 60.
AUG 60 1V CHAPEL, R.E.; HALL, L.E.; LIVESAY, B.J.;
CONTRACT: AF 34(601)-5470

UNCLASSIFIED REPORT

DESCRIPTORS: *GASKETS, AIRCRAFT EQUIPMENT, FUEL SEALS,
METAL SEALS, PRESSURE, ROTARY SEALS, ROTATING
STRUCTURES, SEALS (STOPPERS), SHAFTS, SURFACES, TEST
FACILITIES (U)

THE DESIGN, FABRICATION, AND TESTING OF A FLUID SEAL TEST
FACILITY.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-424 301

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

PROPOSED MILITARY SPECIFICATION GASKETS, HATCH SEAL
O-RING, OIL-RESISTANT RUBBER. (U)

7P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*GASKETS, MILITARY REQUIREMENTS), (*SEALS
(STOPPERS), SUBMARINES), SPECIFICATIONS, HATCHES,
RUBBER, MECHANICAL PROPERTIES, TESTS, ENVIRONMENTAL
TESTS, TEST METHODS (U)
IDENTIFIERS: 1963, O-RING SEALS (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-426 505

ROCKETDYNE CANOGA PARK CALIF

STUDY OF O-RING AGING CHARACTERISTICS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.

AUG 63 228P

REPT. NO. R9253

CONTRACT: AFO4 607 7339

UNCLASSIFIED REPORT

DESCRIPTORS: (•GASKETS, AGING (MATERIALS)),
(•ROCKET MOTORS, (LIQUID PROPELLANT), GASKETS),
WEAPONS SYSTEMS, LIFE EXPECTANCY, ELASTOMERS,
ANTIOXIDANTS, CORRELATION TECHNIQUES, CRYOGEN
ICS, TEST METHODS, LOW-TEMPERATURE RESEARCH,
OXYGEN, EXPERIMENTAL DATA, TABLES, HARDNESS,
TENSILE PROPERTIES, COMPRESSIVE PROPERTIES,
MATHEMATICAL ANALYSIS, DEGRADATION, STORAGE,
LIQUID ROCKET PROPELLANTS, OXIDATION, SEALS
(STOPPERS).

(U)

IDENTIFIERS: 1963. O-RINGS.

(U)

PRESENTED ARE THE RESULTS OF AN INVESTIGATION MADE
INTO SEVERAL ASPECTS OF SYNTHETIC ELASTOMER AGE
DETERIORATION TO PROVIDE INFORMATION FOR IMPROVED
SERVICE-LIFE ESTIMATES FOR LIQUID ROCKET ENGINES.
AS A RESULT OF THE FINDINGS OF THIS STUDY, IT
APPEARS THAT O-RING (MS28778) PROPERTIES
CHANGE AS A RESULT OF CRYOGENIC EXPOSURE IN A
NONOXIDIZING ENVIRONMENT. THE RESULTS OF THIS
STUDY INDICATE THAT THERE ARE DEFINITE DIFFERENCES
IN THE AGING RATES OF O-RINGS MOLDED BY DIFFERENT
MANUFACTURERS. IT IS GENERALLY RECOGNIZED THAT
THE PRINCIPAL CAUSE OF DETERIORATION OF ELASTOMERS
IS OXIDATION.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-430 759

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

EFFECT OF SHELF AGING ON MIL-P-5516 O-RINGS. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 5,
FEB 64 11P BARRETT, A. E. I
REPT. NO. 92-18
PROJ: SFD12-12-01
TASK: 907

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RUBBER, GASKETS); (*GASKETS, STORAGE);
DEGRADATION, AGING (MATERIALS) (U)
IDENTIFIERS: 1964, O-RINGS (U)

O-RINGS ORIGINALLY CONFORMING TO MILITARY SPECIFICATIONS AND WHICH HAD REACHED THE MAXIMUM ALLOWED STORAGE AGE OF 4 YEARS, WERE TESTED AFTER AN ADDITIONAL 5 YEARS OF SHELF AGING. DURING THE ORIGINAL 4 YEARS THE RINGS WERE SEALED IN LINED ENVELOPES, BUT DURING THE ENSUING 5 YEARS, SOME RINGS WERE EXPOSED TO LIGHT AND AIR, SOME WERE EXPOSED TO AIR WITH LIGHT EXCLUDED AND SOME WERE KEPT SEALED IN THE ORIGINAL ENVELOPES. NO SIGNIFICANT CHANGES IN PHYSICAL PROPERTIES FROM THE STANDPOINT OF SERVICEABILITY WERE OBSERVED AFTER SHELF AGING FOR 5 ADDITIONAL YEARS UNDER THE ABOVE CONDITIONS. IT IS CONCLUDED THAT ORINGS WHICH MEET THE SPECIFICATION REQUIREMENTS WILL GIVE SATISFACTORY SERVICE AFTER AT LEAST 9 YEARS SHELF AGING AT MODERATE ROOM TEMPERATURES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-431 961

SPRINGFIELD ARMORY MASS

DESIGN ANALYSIS OF BELLEVILLE WASHER SPRINGS, (U)

APR 63 DIP SWIESKOWSKI, H. P. ;
MONITOR: SA TR15 1104

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*GASKETS, LOCKING FASTENER DEVICES),
(*LOCKING FASTENER DEVICES, MATHEMATICAL ANALYSIS),
STRESSES, SPRINGS, DESIGN, SERIES, THICKNESS,
ELASTICITY, MULTIPLE OPERATION, EQUATIONS, MECHANICAL
PROPERTIES (U)
IDENTIFIERS: 1963, BELLEVILLE WASHERS (U)

A THEORETICAL STUDY WAS MADE TO OBTAIN DATA TO ESTABLISH AN ANALYTICAL METHOD FOR THE DESIGN OF BELLEVILLE WASHERS FOR ENERGY STORAGE AND TO MODIFY THE CONVENTIONAL FORMULAS TO REPLACE THE DEPENDENT VARIABLES WITH THE INDEPENDENT OR KNOWN VALUES. THESE MODIFIED FORMULAS WERE SUBSEQUENTLY USED TO ESTABLISH THE STRESS REDUCTION OF A NESTED SPRING SYSTEM AND TO DETERMINE AN OPTIM STACKING ATTANGEMENT. A SIMPLIFIED AND DIRECT METHOD FOR THE DESIGN OF WASHERS FOR ENERGY CAPACITY WAS ESTABLISHED. FINAL WORKING STRESS IS PROPORTIONAL TO THE SQUARE ROOT OF THE ENERGY REQUIREMENT, AND IS INVERSELY PROPORTIONAL TO THE OUTSIDE DIAMETER AND THE SQUARE ROOT OF THE SOLID HEIGHT. THE STUDY FURTHER SHOWS THAT THE FINAL STRESS IS AT A MINIMUM WHEN THE DIAMETER RATIO $A = OD/ID$ EQUALS 1.7. THE ONE-PARALLEL SERIES OF THE STACKING ARRANGEMENTS CONSIDERED IS THE MOST EFFICIENT FOR ENERGY STORAGE. DETAILED DERIVATIONS ARE SHOWN AND RESULTS DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAMLS

AD-466 035

ARMY BALLISTIC MISSILE AGENCY REDSTONE ARSENAL ALA

LUBRICANTS, SEALANTS, THREADING COMPOUNDS, PACKING
AND GASKETS FOR USE IN ABMA MISSILE SYSTEMS, (U)

JAN 59 14P CURRY, JAMES E. ;
REPT. NO. ABMA-DSM-TN-3-59

UNCLASSIFIED REPORT
AVAILABILITY: REFERENCE ONLY AFTER ORIGINAL COPIES
EXHAUSTED.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*LUBRICANTS, COMPATIBILITY),
(*SEALING COMPOUNDS, COMPATIBILITY), (*GASKETS,
COMPATIBILITY), (*LIQUID ROCKET FUELS,
COMPATIBILITY), (*LIQUID ROCKET OXIDIZERS,
COMPATIBILITY), TABLES, SOURCES, TEST METHODS,
LIQUEFIED GASES, OXYGEN, HYDROGEN PEROXIDE,
NITROGEN COMPOUNDS, TETROXIDES, JET ENGINE FUELS,
ALCOHOLS, HYDRAZINE, HYDRAZINE DERIVATIVES (U)

FURTHER STUDIES HAVE BEEN MADE ON SEALANTS,
LUBRICANTS, THREADING COMPOUNDS, PACKING, AND GASKETS
TO DETERMINE THEIR COMPATIBILITY WITH MISSILE FUELS
AND OXIDIZERS. THIS INFORMATION IS TABULATED IN A
COMPATIBILITY CHART WHICH LISTS THE MATERIALS
RECOMMENDED SPECIFICALLY FOR USE IN VARIOUS FUELS AND
OXIDIZER SYSTEMS. THIS INFORMATION SUPERSEDES
OTHER COMPATIBILITY CHARTS PREVIOUSLY ISSUED.
A SECOND TABULATION (THE CROSSCOMPATIBILITY
CHART) SHOWS THE BEHAVIOR OF THE RECOMMENDED
MATERIALS IN ALL FUELS AND OXIDIZERS OF CURRENT
INTEREST TO ABMA. SUPPLIERS OF THESE MATERIALS ARE
LISTED ALSO. THE TEST METHODS EMPLOYED ARE
DESCRIBED AND SUPPLEMENTARY INFORMATION ON EACH
PROPELLANT IS INCLUDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-636 942

11/4

NEW YORK UNIV N Y SCHOOL OF ENGINEERING AND SCIENCE

RESEARCH ON HIGH PRESSURE MEDIA.

(U)

DESCRIPTIVE NOTE: FINAL SCIENTIFIC REPT., 1 MAR 65-28

FEB 66.

APR 66

33P

PRINCE, M. IOKAMOTO, Y. ;

CONTRACT: AF 19(628)-4996,

PROJ: AF-5621,

TASK: 562101,

MONITOR: AFCRL

66-335

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•HIGH-PRESSURE RESEARCH, GASKETS),
(•GASKETS, MATERIALS), (•COMPOSITE MATERIALS,
GASKETS), PLASTICS, LITHIUM COMPOUNDS, HYDRIDES,
BORON, HEAT-RESISTANT MATERIALS, MOLDING,
MACHINING, THERMAL STABILITY, X-RAYS,
ABSORPTION, PHENYL ETHERS, POLYETHYLENE PLASTICS,
CARBON BLACK, PRESSES(MACHINERY)

(U)

AN INVESTIGATION WAS MADE OF THE PREPARATION OF NEW GASKETING MATERIALS FOR ULTRA-HIGH PRESSURES WITH MAXIMUM X-RAY TRANSPARENCY. SATISFACTORY RESULTS WERE OBTAINED WITH COMPOSITE MATERIALS BASED UPON LITHIUM HYDRIDE-ORGANIC PLASTICS AND AMORPHOUS BORON-ORGANIC PLASTICS. THESE COMPOSITES ARE MOLDABLE AND EASILY MACHINABLE MATERIALS. THE LITHIUM HYDRIDE COMPOSITES PERFORMED WITHOUT DECOMPOSITION TO 500C AND THE BORON COMPOSITES TO 1100C. ALL HAVE FUNCTIONED AS EXCELLENT GASKETING MATERIALS WITH HIGH X-RAY TRANSPARENCY UP TO PRESSURES OF 32 KBAR AND AT MAXIMUM TESTED TEMPERATURES FOR AT LEAST 30 MINUTES. CONVENIENT TECHNIQUES WERE DEVELOPED FOR RAPIDLY MOLDING TETRAHEDRA FOR USE IN TETRAHEDRAL ANVIL HIGH PRESSURE DEVICES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-665 859 14/2 11/4
NEW YORK UNIV N Y RESEARCH DIV

GASKETING MEDIA AT ULTRA-HIGH PRESSURE. (U)

DESCRIPTIVE NOTE: MARTIN /PRINCE ;YOSHIYUKI /OKAMOTO
MAY 67 180P PRINCE ,MARTIN ;OKAMOTO,
YOSHIYUKI ;
REPT. NO. SCIENTIFIC-1
CONTRACT: AF 19(628)-5990
PROJ: AF-5621
TASK: 562104
MONITOR: AFCRL 67-0502

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES AD-661 587.

DESCRIPTORS: (*HIGH-PRESSURE RESEARCH, GASKETS),
(*GASKETS, COMPOSITE MATERIALS), BORON, X-RAY
DIFFRACTION ANALYSIS, THERMAL STABILITY, COMPRESSIVE
PROPERTIES, EPOXY PLASTICS, LITHIUM COMPOUNDS,
HYDRIDES, BINDERS, PHASE STUDIES (U)
IDENTIFIERS: POLYPROPYLENE OXIDES, LITHIUM
HYDRIDE (U)

THE DEVELOPMENT OF NEW MATERIALS TO BE USED AS
SOLID PRESSURE TRANSMITTING MEDIA IN ULTRA-HIGH
PRESSURE, HIGH TEMPERATURE APPARATUS EQUIPPED WITH X-
RAY FACILITIES HAS BEEN INVESTIGATED. THE ULTRA-
HIGH PRESSURE APPARATUS USED WAS THE TETRAHEDRAL
ANVIL PRESS DESIGNED BY HALL. FOUR COMPOSITE
MATERIALS WERE FOUND TO BE SUPERIOR TO ALL OTHERS
TESTED: (1) 70% AMORPHOUS BORON, 30%
POLYPHENYLENE OXIDE; (2) 80% AMORPHOUS BORON,
15% POLYPHENYLENE OXIDE, 5% NaCl; (3)
80% LITHIUM HYDRIDE, 20% POLYPHENYLENE OXIDE; AND
(4) 90% LITHIUM HYDRIDE, 10% POLYPHENYLENE
OXIDE. THE COMPOSITES WERE TESTED FOR THEIR
STABILITY AT HIGH TEMPERATURE, AT ATMOSPHERIC
PRESSURE UNDER INERT CONDITIONS AND AT A PRESSURE OF
40 KILOBARS IN A TETRAHEDRAL ANVIL PRESS. HIGH
PRESSURE CALIBRATION EXPERIMENTS WERE PERFORMED FOR
EACH COMPOSITE BY UTILIZING RESISTANCE TRANSITIONS IN
BISMUTH I TO II AND II TO III AT ROOM
TEMPERATURE. THE MATERIALS HAVE ALSO BEEN RATED AS
EFFECTIVE GASKETING MATERIALS BY COMPARISON TO THE
STANDARD MATERIAL, PYROPHYLLITE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-665 860 14/2 11/4
NEW YORK UNIV N Y RESEARCH DIV

GASKETING MEDIA AT ULTRA-HIGH PRESSURE.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 MAY 66-30 APR 67,
JUN 67 44P PRINCE, MARTIN OKAMOTO,
YOSHIYUKI ;

CONTRACT: AF 19(628)-5990

PROJ: AF-5621

TASK: 562104

MONITOR: AFCRL 67-0592

UNCLASSIFIED REPORT

DESCRIPTORS: (*HIGH-PRESSURE RESEARCH, GASKETS),
(*GASKETS, *COMPOSITE MATERIALS), BORON, X-RAY
DIFFRACTION ANALYSIS, THERMAL STABILITY, COMPRESSIVE
PROPERTIES, EPOXY PLASTICS, LITHIUM COMPOUNDS,
HYDRIDES, BINDERS, PHASE STUDIES

(U)

IDENTIFIERS: POLYPROPYLENE OXIDES, LITHIUM
HYDRIDE

(U)

THE DEVELOPMENT OF NEW MATERIALS TO BE USED AS
SOLID PRESSURE TRANSMITTING MEDIA IN ULTRA-HIGH
PRESSURE, HIGH TEMPERATURE APPARATUS, EQUIPPED WITH X-
RAY FACILITIES HAS BEEN INVESTIGATED. THE ULTRA-
HIGH PRESSURE APPARATUS USED WAS THE TETRAHEDRAL
ANVIL PRESS. FOUR COMPOSITE MATERIALS WERE FOUND
TO BE SUPERIOR TO ALL OTHERS TESTED: (1) 70%
AMORPHOUS BORON, 30% POLYPHENYLENE OXIDE; (2)
80% AMORPHOUS BORON, 15% POLYPHENYLENE OXIDE,
5% NALCON; (3) 80% LITHIUM HYDRIDE, 20%
POLYPHENYLENE OXIDE; AND (4) 90% LITHIUM
HYDRIDE, 10% POLYPHENYLENE OXIDE. THE COMPOSITES
WERE TESTED FOR THEIR STABILITY AT HIGH TEMPERATURES
AT ATMOSPHERIC PRESSURE UNDER INERT CONDITIONS AND AT
A PRESSURE OF 40 KILOBARS IN A TETRAHEDRAL ANVIL
PRESS. HIGH PRESSURE CALIBRATION EXPERIMENTS WERE
PERFORMED FOR EACH COMPOSITE BY UTILIZING RESISTANCE
TRANSITIONS IN BISMUTH I TO II AND II TO III AT ROOM
TEMPERATURE. THE MATERIALS HAVE ALSO BEEN RATED AS
EFFECTIVE GASKETING MATERIALS BY COMPARISON TO THE
STANDARD MATERIAL PYROPHYLLITE. OTHER HIGH
TEMPERATURE POLYMERS SUCH AS POLYIMIDES DID NOT PROVE
SATISFACTORY. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-677 734 11/1 12/8
GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF

TRAPPED RUBBER BLANKING AND PIERCING PRODUCTION
EVALUATION. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 61 28P MURPHY, J. F. ;
REPT. NO. GDC-PR-351

UNCLASSIFIED REPORT

DESCRIPTORS: (•RUBBER GASKETS, MANUFACTURING
METHODS), TEMPLATES, DIES, SHEETS, RUBBER,
FEASIBILITY STUDIES, COST EFFECTIVENESS,
PRESSES(MACHINERY). (U)

IDENTIFIERS: •PRODUCTION EVALUATION MEASURES (U)

THE REPORT DISCUSSES THE ECONOMIC CONSIDERATIONS OF
USING A TRAPPED RUBBER BLANKING AND PIERCING PROCESS
TO MAKE SMALL QUANTITY OF COMPLEX SHAPED RUBBER
ITEMS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAML5

AD-713 620 11/6 11/4 11/9
MARTIN MARIETTA CORP DENVER COLO DENVER DIV

CRYOGENIC MATERIALS DATA HANDBOOK (REVISED).
VOLUME II. SECTIONS D, E, F, G, H AND
I. (U)

DESCRIPTIVE NOTE: TECHNICAL DOCUMENTARY REPT.,
JUL 70 552P SCHWARTZBERG, FRED H. ;
OSGOOD, SAMUEL H. ; BRYANT, CAROL ; KNIGHT, MARVIN
;

CONTRACT: AF 33(657)-9161, F33615-67-C-1794
PROJ: AF-7381
TASK: 738106
MONITOR: AFML TDR-64-280-VOL-2-REV

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REVISION OF REPORT DATED AUG 64,
AD-609 562 AND SUPPLEMENT 4 DATED AUG 68, AD-679
087. SEE ALSO VOLUME I, REVISED, AD-713 619.

DESCRIPTORS: (*CRYOGENICS, *HANDBOOKS), (*NICKEL
ALLOYS, CRYOGENICS), (*STEEL, CRYOGENICS),
(*POLYMERS, CRYOGENICS), (*REINFORCED PLASTICS,
CRYOGENICS), (*SEALS, CRYOGENICS), (*COPPER
ALLOYS, CRYOGENICS), GASKETS, MECHANICAL
PROPERTIES, NYLON, EPOXY PLASTICS, POLYESTER
PLASTICS, COMPOSITE MATERIALS, TEST METHODS (U)
IDENTIFIERS: INCONEL, *TETRAFLUOROETHYLENE RESINS,
*FIBERGLASS REINFORCED PLASTICS, (U)
*POLYCHLOROTRIFLUORO ETHYLENE

THE REPORT CONTAINS INFORMATION ON THE CRYOGENIC
MECHANICAL PROPERTIES OF SUPERALLOYS, STEEL,
MISCELLANEOUS METALS AND ALLOYS, POLYMERS, FIBER
REINFORCED PLASTICS, AND SEALS AND GASKETS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZAMLS

AD-843 382 11/1
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SEAL SYSTEMS IN HYDROSPACE. PHASE I.
MECHANICAL INTEGRITY OF FLANGE SEAL
SYSTEMS.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE;
NOV 68 29P JENKINS, JAMES F.; REINHART,
FRED M. ;
REPT. NO. NCEL-TN-999
PROJ: Y-F38-535-005-01-008

UNCLASSIFIED REPORT

DESCRIPTORS: (*SEALS, PERFORMANCE(ENGINEERING)),
(*GASKETS, EXPOSURE), FLANGES, SEA WATER,
HYDROSTATIC TESTS, DEGRADATION, CORROSION, O-
RINGS, PRESSURE VESSELS, LOADING(MECHANICS),
LEAKAGE(FLUID), OCEAN BOTTOM, EXTRUSION,
DEGRADATION

(U)

LONG-TERM EFFECTS OF HYDROSPACE ON SEALS AND
GASKETS ARE UNDER INVESTIGATION AT NCEL. PHASE
I INCLUDES INVESTIGATION OF THE MECHANICAL
INTEGRITY OF FIFTEEN SEAL SYSTEMS BY MEANS OF TESTS
IN PRESSURE VESSELS. THERE WAS NO SEAL EXTRUSION
OR LEAKAGE OF ANY OF THE CONFIGURATIONS INVESTIGATED.
LONG-TERM OCEAN EXPOSURES AND CYCLIC LOADING OF
SEAL SYSTEMS IN PRESSURE VESSELS ARE PLANNED.
(AUTHOR)

(U)

III. GLASS SEALS

32.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBMLS

AD-261 979

CORNING GLASS WORKS N Y

PILOT PRODUCTION OF GLASS CRYSTAL HOLDERS (HC-(XM-2)/
U; HC-(XM-3)/U; HC-(XM-4)/U) (U)

MAY 61 IV WHITNEY, R.K.:
CONTRACT: DA36 0395C81255

UNCLASSIFIED REPORT

DESCRIPTORS: *CRYSTAL HOLDERS, *GLASS SEALS, GLASS,
INDUSTRIAL PRODUCTION, MANUFACTURING METHODS,
PRODUCTION, QUARTZ, SEALS (STOPPERS), TEMPERATURE (U)

PILOT PRODUCTION OF THE HC-(XM-2)/U AND HC-
(XM-4)/U HAS BEGUN. TECHNICAL PROBLEMS WITH
EQUIPMENT HAS DELAYED DELIVERIES OF THESE TWO
HOLDERS. PREPRODUCTION SEALING OF THE HC-(XM-3)/
U HOLDER HAS YET TO BE SATISFACTORILY ACCOMPLISHED.
THE ATTAINMENT OF THE SPECIFIED TEMPERATURE LIMIT
OF 250 C. APPEARS TO BE BEYOND ATTAINMENT WITH THE
SPECIFIED GLASS AND METAL AND CURRENT SEALING METHOD.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBML5

AD-266 246

KNIGHTS (JAMES) CO SANDWICH ILL

GLASS HOLDER CRYSTAL UNITS

(U)

JUL 61 1V SNYDER, C.W.:

CONTRACT: DA36 039SC81274

UNCLASSIFIED REPORT

DESCRIPTORS: *CRYSTAL HOLDERS, *GLASS SEALS,
*MANUFACTURING METHODS, *QUARTZ, DESIGN, INDUSTRIAL
EQUIPMENT, INDUSTRIAL PRODUCTION, PRODUCTION, SEALS
(STOPPERS), VACUUM SEALS

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBML5

AD-268 416

TUNG-SOL ELECTRIC INC LIVINGSTON N J CHATHAM ELECTRONICS
DIV

PRODUCTION ENGINEERING MEASURE FOR POLYOPTIC SEALING
OF HYDROGEN THYRATRON TUBES (U)

OCT 61 1V WATROUS, WARD W.;
CONTRACT: DA36 039SC81289

UNCLASSIFIED REPORT

DESCRIPTORS: *GLASS SEALS, *MANUFACTURING METHODS,
*MINIATURE ELECTRON TUBES, *THYRATRON, CERAMIC,
COATINGS, ELECTRICAL PROPERTIES, ELECTRON TUBES,
HYDROGEN, LIFE EXPECTANCY, MECHANICAL PROPERTIES,
PRODUCTION, SEALING COMPOUNDS, SEALS (STOPPERS),
TEMPERATURE, TESTS (U)

RESEARCH WAS CONTINUED ON THE POLYOPTIC SEALING OF
HYDROGEN THYRATRON TUBES. LIFE TESTS WERE
CONTINUED. ALL TUBES REQUIRED TO HAVE BEEN MADE ON
THE AUTOMATIC EXHAUST MACHINE HAVE EITHER COMPLETED
LIFE TEST OR ARE BEING TESTED. THE PRESENT RESULTS
SHOW NO ESSENTIAL DIFFERENCE IN SURVIVAL RATES
BETWEEN THE 2 TYPES OF SEALS. NO FURTHER WORK ON
VARIATIONS IN SEALING TECHNIQUES WAS DONE BUT
CONSIDERATION IS GIVEN TO AN EXTENSION OF THE HIGH
TEMPERATURE BAKE PROCESS INVESTIGATION. INITIAL
WORK WAS BEGUN IN DETERMINING THE PROPER TECHNIQUES
FOR POLYOPTIC SEALING ON TROLLEY EXHAUST.
(AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBML5

AD-271 916

CORNING GLASS WORKS N Y

PILOT PRODUCTION OF GLASS CRYSTAL HOLDERS (HC-(XM-2)/
U; HC-(XM-3)/U; IC-(XM-4)/U) (U)

NOV 61 IV WHITNEY, R.K.;
CONTRACT: DA36 039SC81255

UNCLASSIFIED REPORT

DESCRIPTORS: CRYSTAL HOLDERS, GLASS SEALS, BRONZE,
GLASS, GOLD, HIGH-TEMPERATURE RESEARCH, INDUSTRIAL,
PRODUCTION, MANUFACTURING METHODS, PLATING, QUARTZ,
SEALS (STOPPERS), SOLDERING, SOLDERING FLUXES, WIRE (U)

A CHANGE IN BASE SUPPLIERS FOR THE HC-(XM-2)/U
HOLDER NECESSITATED ANOTHER PREPRODUCTION SAMPLE FOR
SEALING AND TESTING. THIS TESTING WAS COMPLETED.
PREPRODUCTION SEALING OF THE HC-(XM-3)/U
HOLDER HAS YET TO BE SATISFACTORILY ACCOMPLISHED.
THE ATTAINMENT OF THE SPECIFIED TEMPERATURE LIMIT
OF 250 C. APPEARS BEYOND ATTAINMENT WITH THE
SPECIFIED GLASS AND METAL AND CURRENT SEALING METHOD.
PILOT PRODUCTION OF THE HC-(XM-4)/U HOLDER
WAS COMPLETED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBML5

AD-272 338

TUNG-SOL ELECTRIC INC LIVINGSTON N J CHATHAM ELECTRONICS
DIV

PRODUCTION ENGINEERING MEASURE FOR POLYOPTIC SEALING
OF HYDROGEN THYRATRON TUBES (U)

FEB 42 1V DIXON, G.H.:

CONTRACT: DA36 039SC81289

UNCLASSIFIED REPORT

DESCRIPTORS: *DEGASIFICATION, *GLASS SEALS,
*MANUFACTURING METHODS, *THYRATRONS, CERAMIC COATINGS,
ELECTRON TUBES, HYDROGEN, LIFE EXPECTANCY, MINIATURE
ELECTRON TUBES, PRODUCTION, SEALING COMPOUNDS, SEALS
(STOPPERS), TEMPERATURE (U)

LIFE TESTS OF AUTOMATICALLY SEALED AND EXHAUSTED
7190 POLYOPTIC HYDROGEN THYRATRONS CONTINUED.
SEVERAL OF THE 75 REQUIRED HOT RING, TROLLEY
TECHNIQUE, POLYOPTIC TUBES WERE PLACED ON LIFE TEST.
AS A RESULT OF THE EXPERIENCE GAINED IN FABRICATING
THESE TUBES, ADDITIONAL EFFORT WAS PLACED ON LEARNING
THE LIMITING TOLERANCES TO BE ADOPTED FOR THE TUBE
PARTS, PROCESSING, AND FIXTURES. HIGH TEMPERATURE
BAKE POLYOPTIC SEALS WERE ATTEMPTED IN EXPLORATORY
EXPERIMENTS TO EVALUATE THE USE OF ENVELOPE GLASS OF
A HIGHER SOFTENING TEMPERATURE THAN THAT OF THE STEM.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBML5

AD-282 892

TUNG-SOL ELECTRIC INC LIVINGSTON N J CHATHAM ELECTRONICS
DIV

PRODUCTION ENGINEERING MEASURE FOR POLYOPTIC SEALING
OF HYDROGEN THYRATRON TUBES (U)

AUG 62 1V DIXON, G.H.;
CONTRACT: DA36 039SC81289

UNCLASSIFIED REPORT

DESCRIPTORS: *GLASS SEALS, *MINIATURE ELECTRON TUBES,
*THYRATRON, DEGASIFICATION, HYDROGEN, LIFE EXPECTANCY,
PRODUCTION, SEALING COMPOUNDS, SEALS (STOPPERS),
TESTS (U)

POLYOPTIC SEALING: DURING THE OBSERVATIONS
MADE TO DETERMINE THE INFLUENCE OF POLYOPTIC FIT ON
EXHAUST PRESSURE, IT WAS FOUND THAT CLEANLINESS OF
FIT AND INTIMACY WERE CONSIDERABLY MORE IMPORTANT TO
THE VACUUM TIGHTNESS THAN THE PERFECTION OF SPHERICAL
SHAPES. THAT IS BETWEEN 8 FRINGES LARGE AND 5
FRINGES SMALL BUTT SPHERICAL DIAMETER, THE
POLYOPTIC ASSEMBLY PROCEDURE HAS BEEN CHANGED SUCH
THAT AN INTERMOLECULAR BOND MUST BE ACHIEVED DURING
ASSEMBLY, PRIOR TO SEALING, LIFE TESTING
POLYOPTIC TUBES: PRELIMINARY LIFE TESTING OF
LOT B, SEALED DURING THIS QUARTER, INDICATES A
GENERAL REDUCTION IN LIFE FROM WHAT HAD PREVIOUSLY
BEEN CONSIDERED AS NORMAL LIFE EXPECTANCY FOR
POLYOPTIC SEALING. NO SEAL FAILURES WERE OBSERVED.
COMPARATIVE LIFE TESTING OF FLAME SEALED
TUBES: DUE TO THE FACT THAT ONLY A LIMITED
QUANTITY OF TUBES WERE TESTED FOR 500 HOURS, NO
CONCLUSIONS CAN BE DRAWN AT THIS TIME,
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBMLS

AD-283 498

KNIGHTS (JAMES) CO SANDWICH ILL

CRYSTAL UNITS TYPE CR(XM-11/U)

(U)

APR 62 1V BENNETT, R.E. :
CONTRACT: DA36 0395C81274

UNCLASSIFIED REPORT

DESCRIPTORS: *CRYSTAL HOLDERS, *GLASS SEALS,
*MANUFACTURING METHODS, *QUARTZ, ADHESIVES, COOLING,
INDUSTRIAL EQUIPMENT, INDUSTRIAL PRODUCTION, MACHINES,
SEALS (STOPPERS), VACUUM SEALS (U)

THE PROCESS OF ADJUSTING THE INDUCTION-SEALING
MACHINE, PREPARATORY TO READYING IT FOR PRODUCTION IS
DESCRIBED. FURTHER EXPERIMENTS WITH BONDING
CEMENTS IN AN EFFORT TO SECURE MECHANICAL STRENGTH,
CONDUCTIVITY, AND FREEDOM FROM OUTGASSING UNDER THE
TEMPERATURES INVOLVED IN GLASS SEALING ARE DESCRIBED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBMLS

AD-284 989

SYNTHETIC MICA CO WEST CALDWELL N J

ULTRA HIGH TEMPERATURE DIELECTRIC EMBEDDING
MATERIALS

(U)

JUL 62 1V RODNEY, STANLEY;
CONTRACT: NOBS86219

UNCLASSIFIED REPORT

DESCRIPTORS: *CERAMIC COATINGS, *EMBEDDING SUBSTANCES,
*ENCAPSULATION, *GLASS SEALS, DIELECTRICS, ELECTRIC
INSULATION, ELECTRONIC EQUIPMENT, GLASS, HIGH-
TEMPERATURE RESEARCH, MANUFACTURING METHODS, MICA,
PHOSPHATES

(U)

A GLASS WAS DEVELOPED WHICH HAS THE SAME
DEVITRIFICATION PROPERTIES AND BETTER RESISTANCE TO
REDUCTION THAN THE COMMERCIALLY AVAILABLE TYPE USED
PREVIOUSLY. THE OPTIMUM DEVITRIFICATION
TEMPERATURE OF THE GLASS WAS FOUND TO BE BETWEEN 550
C AND 600 C. FLUIDIZED BED OPERATION WAS FOUND
TO BE MOST EFFICIENT USING GLASS PARTICLES IN THE
SIZE RANGE BETWEEN 75 MICRONS AT THE UPPER LIMIT A
45 MICRONS AT THE LOWER LIMIT. THE FLUIDIZED BED
TECHNIQUE LEAD TO A COATING THICKNESS WHICH IS
UNIFORM TO 1108. (AUTHOR)

(U)

UNCLASSIFIED

DNC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBMLS

AD-294 155

RENDIX CORP EATONTOWN N J

CERAMIC TO METAL SEALS FOR HIGH-TEMPERATURE
THERMIONIC CONVERTERS

(U)

JAN 63 IV DRING, H. L. I
REPT. NO. RBES0 3404 1
CONTRACT: AF33 657 10038

UNCLASSIFIED REPORT

DESCRIPTORS: *CERAMIC MATERIALS, *GLASS SEALS,
*REFRACTORY MATERIALS, *SEALS (STOPPERS), ALUMINUM
COMPOUNDS, BONDING, CATHODES (ELECTRON TUBES), CESIUM,
COMPOSITE MATERIALS, DIFFUSION, DIODES, ELECTRON BEAMS,
GLASS, HIGH-TEMPERATURE RESEARCH, MANGANESE, METAL
COATINGS, METAL SEALS, MOLYBDENUM, OXIDES, PHASE
STUDIES, PLATING, RHODIUM, THERMIONIC CONVERTERS,
TUNGSTEN, ULTRASONIC RADIATION, WELDING

(U)

THE FIRST QUARTER OF A ONE YEAR PROGRAM TO DEVELOP
IMPROVED CERAMIC TO METAL SEALS FOR USE IN THERMIONIC
CONVERTERS IS REPORTED. THE OBJECTIVE OF THIS
PROGRAM IS TO DEVELOP SEALS WHICH ARE CAPABLE OF LONG
LIFE AT 1500 C IN CESIUM AND VACUUM ENVIRONMENTS,
AND TO EXTEND THE SEALING TECHNIQUES DEVELOPED TO
MATERIALS WHICH ARE CAPABLE OF LONG LIFE AT
TEMPERATURES IN EXCESS OF 1500 C. THE PROJECT WAS
DIVIDED AS FOLLOWS: DEVELOPMENT OF SEALS BETWEEN
HIGH PURITY ALUMINA AND MOLYBDENUM; DEVELOPMENT OF
CERAMIC-METAL COMPOSITE MATERIALS FROM WHICH
CONVERTER ENVELOPES CAN BE FABRICATED WITH CONTROLLED
GRADUATION OF COMPOSITION THROUGHOUT THE ENVELOPE
BODY; STUDY OF REFRACTORY MATERIALS, ANALYSIS OF
MATERIALS SYSTEMS OCCURRING IN SEAL AREAS, AND
OPTIMIZATION OF PARTICULAR CHARACTERISTICS OF
MATERIAL SYSTEMS UTILIZED; AND STUDY OF MATERIAL
SYSTEMS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO, 1ZBML5

AD-413 654

MIDLAND MFG CO INC KANSAS CITY KANS

MODERATE PRECISION GLASS ENCLOSED CRYSTAL
UNITS.

(U)

DESCRIPTIVE NOTE: QUARTERLY PROGRESS REPT. NO. 4, 1
JMAR 63.

AUG 63 24P HAMMER, MELVIN O.;
REPT. NO. CR XM44 U
CONTRACT: DA36 039SC86717

UNCLASSIFIED REPORT

DESCRIPTORS: (*RESONATORS, MANUFACTURING
METHODS), (*GLASS SEALS, MANUFACTURING METHODS),
(*QUARTZ RESONATORS, MANUFACTURING METHODS),
(*CRYSTAL HOLDERS, PRODUCTION).
IDENTIFIERS: 1963.

(U)

(U)

THIS PROGRAM IS AIMED AT ESTABLISHING A PRODUCTION
SOURCE CAPABLE OF MASS PRODUCING A SEMI PRECISION
QUARTZ CRYSTAL UNIT IN AN EVACUATED GLASS HOLDER.
WHEN ATTEMPTING TO MANUFACTURE A SEMI-PRECISION
CRYSTAL UNIT, SEVERAL ITEMS MUST BE CONSIDERED AND
REAPPRAISED IN THE LIGHT OF GENERALLY TIGHTER
PERFORMANCE TOLERANCES. THIS REAPPRAISAL GENERALLY
LEADS TO TIGHTENING OF MANUFACTURING CONTROLS AND
TOLERANCES. CONVENTIONAL METHODS OF QUARTZ
ORIENTATION, SAWING, DICING, DIMENSIONING AND
LAPPING WILL BE USED TO OBTAIN A SUITABLE QUARTZ
PLATO. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBMLS

AD-610 837

HARRY DIAMOND LABS WASHINGTON D C

SOLDER-GLASS SEALING OF MICROWAVE ANTENNA WINDOWS.

(U)

NOV 64 15P BLOMQUIST, T. V. ;
REPT. NO. TM-64-28
PROJ: DA 1P523801A300 796300

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*WAVEGUIDE WINDOWS, GLASS SEALS), (*GLASS
SEALS, WAVEGUIDE WINDOWS), (*METAL SEALS, WAVEGUIDE
WINDOWS), STAINLESS STEEL, VACUUM SEALS, THERMAL
EXPANSION, MICA

(U)

SIMPLE SOLDER-GLASS TECHNIQUES ARE DESCRIBED FOR
VACUUM-TIGHT SEALING OF MICA AND GLASS MICROWAVE
WINDOWS IN A METAL FRAME HAVING A COMPATIBLE
COEFFICIENT OF THERMAL EXPANSION. THE SEAL IS MADE
BY APPLYING 0.020 IN. DIAMETER THREADS OF CORNING
NO. 7570 SOLDER GLASS TO HEATED FRAME AND WINDOW.
A HAND TORCH AND QUARTZ BOAT PROVED SATISFACTORY
FOR HEATING WITH MICA OF THICKNESSES OF 0.003 IN. OR
GREATER. A SIMPLE CONE RESISTANCE HEATER WITH
VARIAC AND A METAL TABLE PROVIDED MORE PRECISE
HEATING FOR SEALING THINNER WINDOWS. THE MATERIALS
ARE INEXPENSIVE; THE PROCEDURE AND EQUIPMENT ARE
SIMPLE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZBML5

AD-633 296 11/1

NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)

COLD WELDED INDIUM LOW TEMPERATURE WINDOW SEAL, (U)

SEP 65 1P LIPSETT, F. R. ;
REPT. NO. NRC-8841,

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN REVIEW OF SCIENTIFIC
INSTRUMENTS V37 N2 P229 FEB 1966.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*INDIUM, *GLASS SEALS), CANADA,
CRYOSTATS, METAL COATINGS, O-RINGS, CRYOGENICS,
VACUUM SEALS (U)

REPRINT: COLD WELDED INDIUM LOW TEMPERATURE WINDOW
SEAL.

IV. HERMETIC AND HYDRAULIC SEALS

1/6/6

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-236 837

ROCK ISLAND ARSENAL ILL

INVESTIGATION OF HYDROPNEUMATIC RECOIL MECHANISM
PACKING SPRING LOADS

(U)

APR 60 1V RAISBECK, L.R.;

UNCLASSIFIED REPORT

DESCRIPTORS: *GASKETS, *HOWITZERS, *HYDRAULIC SFALS,
*PNEUMATIC DEVICES, *RECOIL MECHANISMS, *SEALS
(STOPPERS), *SPRINGS, EFFECTIVENESS, PISTONS,
TEMPERATURE, TESTS

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-257 940

REPUBLIC AVIATION CORP FARMINGDALE N Y

DESIGN AND DEVELOPMENT OF A 1000 F HYDRAULIC SYSTEM,
PART III. PHASE II INVESTIGATION (U)

1V MAYHEW, WILLIAM E.;

UNCLASSIFIED REPORT

DESCRIPTORS: *HYDRAULIC ACTUATORS, *HYDRAULIC FLUID
FILTERS, *HYDRAULIC SEALS, *HYDRAULIC SERVOMECHANISMS,
*HYDRAULIC SYSTEMS, *HYDRAULIC VALVES, *PUMPS, AIRCRAFT
EQUIPMENT, CONTROL SYSTEMS, DESIGN, HIGH-TEMPERATURE
RESEARCH, HYDRAULIC ACCUMULATORS, HYDRAULIC FLUIDS,
MATERIALS, SERVOMECHANISMS, TEST FACILITIES (U)

INFORMATION IS PRESENTED ON THE DESIGN AND
FABRICATION OF THE COMPONENTS TO BE USED IN A
HYDRAULIC SYSTEM WHERE A SIGNIFICANT PORTION OF THE
SYSTEM WILL OPERATE AT A FLUID TEMPERATURE OF 1000
F IN AN AMBIENT TEMPERATURE OF 1200 F. FURTHER
WORK WITH REGARD TO THE PHENOXYPHENYL ETHER
PREVIOUSLY CHOSEN AS THE MOST PROMISING FLUID FOR
THIS SYSTEM IS DESCRIBED. THE RESULTS OF A SEAL
TEST PROGRAM, INCLUDING STATIC AND DYNAMIC SEALS, ARE
ALSO INCLUDED. IN ADDITION, THE FACILITIES
DESIGNED, FABRICATED, AND PROCURED TO EVALUATE THE
SYSTEM MOCKUP IN THE REQUIRED ENVIRONMENTS ARE
DESCRIBED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-260 465

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

SUITABILITY OF VITON B O-RINGS FOR USE IN 3000 PSI
HYDRAULIC SYSTEMS CONTAINING PETROLEUM BASE OR
PHOSPHATE ESTER FLUIDS

(U)

IV BARRETT, A.E. I

UNCLASSIFIED REPORT

DESCRIPTORS: *HYDRAULIC SEALS, *HYDRAULIC SYSTEMS,
CYCLOHEXANES, EFFECTIVENESS, ESTERS, ETHYLENES,
FLUORIDES, HYDRAULIC FLUIDS, MATERIALS, PETROLEUM,
PHOSPHATES, POLYMERS, RUBBER, SYNTHETIC RUBBER, TESTS(U)

RESULTS OF DYNAMIC PERFORMANCE TESTS OF VITON B
O-RINGS INDICATE THAT VITON B O-RINGS OF 70
SHORE A HARDNESS WITH TEFLON BACKUP RINGS WILL
PERFORM SATISFACTORILY AT 180 F IN 3000 PSI
HYDRAULIC SYSTEMS CONTAINING PHOSPHATE ESTER FLUIDS.
IN ADDITION, THE RESULTS INDICATE THAT THE O-
RINGS WILL PERFORM EQUALLY AS WELL UNDER THESE
CONDITIONS IN HYDRAULIC SYSTEMS CONTAINING PETROLEUM
BASE FLUIDS. AS REPORTED PREVIOUSLY, THE TEFLON
BACKUP RINGS DO NOT STAND UP AT 300 F UNDER THE
TEST CONDITIONS. BACKUP RINGS MADE OF A 90 SHORE
A VITON B STOCK SHOWED EVEN GREATER WEAR.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-270 746

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

SUITABILITY OF VITON B O-RINGS FOR USE IN 3000 PSI
HYDRAULIC SYSTEMS CONTAINING PETROLEUM BASE FLUID OR
CELLULUBE 220 (U)

NOV 61 1V FORD, R.D.;

UNCLASSIFIED REPORT

DESCRIPTORS: *HYDRAULIC SEALS, *HYDRAULIC SYSTEMS,
*RUBBER SEALS, HYDRAULIC FLUIDS, OIL SEALS, ORGANIC
COMPOUNDS, PETROLEUM, PHOSPHATES, POLYMERS, SYNTHETIC
RUBBER, TEST METHODS (U)

EFFORTS WERE MADE TO DEVELOP A PERFORMANCE TEST FOR
VITON O-RINGS TO BE USED IN 3000 PSI HYDRAULIC
SERVICE. THE SERVICE FLUID MAY BE EITHER PETROLEUM
BASE OR CELLULUBE 220. THE TEST APPARATUS
CONSISTED OF A PISTON WITH TWO O-RINGS WHICH
RECIPROCATES 100 TIMES/MIN IN A VERTICAL CYLINDER O
2.63-IN. INTERNAL DIAMETER. THE PISTON TRAVEL IS 1-
1/2 IN. THE CYLINDER IS HELD AT 160 F. TEFLON
BACK-UP RINGS ARE USED ON THE DOWNSTREAM SIDE OF THE
O-RINGS. THE PRESSURE-ON CYCLE LASTS FOR 9 MIN;
THE PRESSURE-OFF CYCLE LASTS FOR 1 MIN. LEAKAGE AT
BOTH ENDS OF THE PISTON IS COLLECTED. DIFFICULTY
WAS EXPERIENCED IN OBTAINING REPRODUCIBLE RESULTS
WITH THIS EQUIPMENT WHEN THE CRITERION WAS TIME
REQUIRED FOR A DEFINITE LEAKAGE (20 CC) TO OCCUR
AT 3000 PSI FLUID PRESSURE. THE TEST RESULTS SHOW
THAT VITON O-RINGS SEAL CELLULUBE 220
SATISFACTORILY UNDER THESE CONDITIONS AND ARE NOT
DAMAGED BY THIS TREATMENT. THE INVESTIGATION IS
BEING CONTINUED WITH THE CRITERION CHANGED TO THE
NUMBER OF CYCLES BEFORE THE LEAKAGE IN A 24-HR PERIOD
EXCEEDS 15 CC FOR EITHER O-RING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-282 710

TRW INC CLEVELAND OHIO

APPLIED RESEARCH ON A HERMETICALLY-SEALED DRIVE
COUPLING FOR SPACE POWER TRANSMISSION (U)

AUG 62 1V NAU.C.S.
REPT. NO. ER 4956
CONTRACT: AF33 657 8486

UNCLASSIFIED REPORT

DESCRIPTORS: *AUXILIARY POWER PLANTS, *HYDRAULIC SEALS,
*LIQUID METALS, *TRANSMISSIONS, *VAPORS, HYDRAULIC
FLUIDS, RUBIDIUM, SODIUM (U)

A ONE TO ONE SPEED RATIO HERMETICALLY SEALED
COUPLING FOR A 15 KW, 24,000 RPM UNIT IS TO BE
DEVELOPED AND THE PROBLEMS ENCOUNTERED IN SCALING THE
UNIT FROM 15 KW TO 3 KW AND 3000 KW ARE TO BE
EVALUATED. THE DESIGN REQUIREMENTS PROVIDE FOR
POWER TRANSMISSION THROUGH A CONTINUOUS BOUNDARY WITH
A DEVICE HAVING A 90%ASSIFIED REPORT

DESCRIPTORS: *LIQUID METALS, *TRANSMISSIONS,
*AUXILIARY POWER PLANTS, *HYDRAULIC SEALS,
*VAPORS, HYDRAULIC FLUIDS, SODIUM,
RUBIDIUM. A ONE TO ONE SPEED RATIO HERMETICALLY
SEALED COUPLING FOR A 15 KW, 24,000 RPM UNIT IS TO
BE DEVELOPED AND THE PROBLEMS ENCOUNTERED IN SCALING
THE UNIT FROM 15 KW TO VER-ALL EFFICIENCY AND 10,
000 HOURS OF MAINTENANCE-FREE DESIGN LIFE.
OPERATING CONDITIONS WILL BE 20 TO 40 PSI PRESSURE
DIFFERENTIAL, 1000 F POTASSIUM OR RUBIDIUM VAPOR ON
ONE SIDE OF THE BOUNDARY, AND 1/100,000 MM HG
VACUUM AT THE SAME TEMPERATURE ON THE OPPOSITE SIDE.
BOTH A DEFORMABLE MEMBRANE AND A MAGNETIC COUPLING
WILL BE EVALUATED EXPERIMENTALLY. ONE OF THE TWO
DEVICES WILL BE SELECTED FOR A 1000 HOUR ENDURANCE
TEST. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-290 611

OKLAHOMA STATE UNIV STILLWATER SCHOOL OF MECHANICAL
ENGINEERING

A STUDY IN THE FIELD OF FLUID SEALS FOR HIGH SPEED
ROTATING EQUIPMENT (U)

SEP 59 1V CHAPEL, R.E.; SCHLAPBACH, M.E.; HALL,
L.E.;
CONTRACT: AF34 601 5470

UNCLASSIFIED REPORT

DESCRIPTORS: *HYDRAULIC SEALS, *ROTARY PUMPS, *ROTARY
SEALS, ASBESTOS, BIBLIOGRAPHIES, BUSHINGS, CONTAINERS,
ELASTOMERS, FAILURE (MECHANICS), FLANGES, FLUID
MECHANICS, FLUOROCARBONS, FRICTION, GASKETS, LEATHER,
METAL SEALS, PISTON RINGS, PLASTIC SEALS, POLYMERS,
RECIPROCATING PUMPS, RUBBER SEALS, SCREW THREADS, SEALS
(STOPPERS), SILICONES, SYNTHETIC RUBBER (U)
IDENTIFIERS: O RINGS (U)

MANY TYPES OF SEALS HAVE BEEN DESIGNED FOR USE IN
RECIPROCATING OR ROTATING MACHINES. IN RECENT
YEARS, PARTICULARLY IN MILITARY APPLICATIONS, THE
SEALING PROBLEM HAS BECOME COMPLEX. HIGH CONTACT
SPEEDS, EXTREME TEMPERATURES, AND SUPERPRESSURES HAVE
PRESENTED THE DESIGNER WITH SOME CHALLENGING
PROBLEMS. THE SEALS FOR NEW APPLICATIONS USUALLY
ARE DEVELOPED BY EXTRAPOLATING DATA FROM PREVIOUS
DESIGNS. MOST OF THE RECENT INVESTIGATIONS HAVE
BEEN EXPERIMENTAL EVALUATIONS OF NEW MATERIALS. THE
WEAR RATE, LEAKAGE, AND FRICTIONAL DRAG OF THE
MATERIAL ARE OBSERVED OVER A RANGE OF SPEEDS,
TEMPERATURES AND PRESSURES. THERE IS LITTLE
EVIDENCE IN THE LITERATURE OF ANALYTICAL STUDIES THAT
PERTAIN TO DYNAMIC FLUID SEALS. A FEW TYPES, SUCH
AS THE LARYRINTH SEAL, HAVE A WELL DEVELOPED
THEORETICAL ANALYSIS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-460 741

NAVY MARINE ENGINEERING LAB ANNAPOLIS MD

AN ANALYTICAL STUDY OF THIN FLUID FILMS IN FACETYPE
SHAFT SEALS, (U)

JUL 62 122P SNAPP, RALPH B. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: MASTER'S THESIS.

DESCRIPTORS: (*HYDRAULIC SEALS, THRUST BEARINGS),
(*FILMS, HYDRAULIC SEALS), MATHEMATICAL ANALYSIS,
EQUATIONS, PRESSURE, FORCE (MECHANICS), THICKNESS,
CENTRIFUGAL FIELDS, ELASTICITY, DEFORMATION, GRAPHICS,
PARABOLIC BODIES, SURFACE PROPERTIES, DESIGN,
PERFORMANCE (ENGINEERING), DIGITAL COMPUTERS, PROPELLERS
(MARINE), SHAFT COUPLINGS, CARBON, WATER (U)
IDENTIFIERS: G-15 COMPUTERS, LEAKAGE, THIN FLUID
FILMS (U)

AN ANALYTICAL STUDY OF THIN FLUID FILMS BETWEEN THE
SEALING SURFACES OF FACE-TYPE SEALS IS PRESENTED FOR
PARALLEL, LINEAR CONVERGING, LINEAR DIVERGING, AND
THREE TYPES OF PARABOLIC FACES. EQUATIONS ARE
DEVELOPED TO ANALYZE THE EFFECT OF THESE CONTOURS ON
PRESSURE PROFILE, FLUID FORCE AT SEAL FACE, FILM
THICKNESS, AND LEAKAGE RATE. CENTRIFUGAL EFFECT OF
THE FLUID FILM IS INCLUDED IN THE ANALYSES AS WELL AS
ELASTIC DEFORMATION OF THE SEALING SURFACE IN BOTH
RADIAL AND AXIAL DIRECTIONS. EQUATIONS ARE ALSO
DEVELOPED FOR INCLUDING FILM THICKNESS VARIATIONS IN
THE TANGENTIAL DIRECTION. GRAPHIC COMPARISONS OF
NUMERICAL SOLUTIONS TO THE EQUATIONS ARE PRESENTED
FOR THE VARIOUS CASES ANALYZED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-633 238 11/1 11/4 13/9
NAVY MARINE ENGINEERING LAB ANNAPOLIS MD

SELF-LUBRICATED COMPOSITE MATERIALS FOR HIGH-PRESSURE
AIR SEALS (FILAMENT-WOUND STRUCTURES). (U)

DESCRIPTIVE NOTE: RESEARCH AND DEVELOPMENT PHASE REPT.,
MAY 66 31P HALLIWELL, HARRY ; WARD, J. R.

REPT. NO. MEL-56/66,
PROJ: S-F020-03-05,
TASK: 0620,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMPOSITE MATERIALS, *FILAMENT WOUND
CONSTRUCTION), (*HERMETIC SEALS, COMPOSITE
MATERIALS), LUBRICATION, HIGH-PRESSURE RESEARCH,
LUBRICANTS, PLASTIC SEALS, GLASS TEXTILES,
COMPRESSOR PARTS, POLYETHYLENE PLASTICS,
LEAKAGE (FLUID), RELIABILITY, WEAR RESISTANCE,
PISTONS, GAS SEALS, LIFE EXPECTANCY (U)
IDENTIFIERS: POLYTETRAFLUOROETHYLENE (U)

IN A CONTINUING PROGRAM TO EXPLOIT THE UNUSUAL
PROPERTIES AND POTENTIAL ADVANTAGES OF SOLID
COMPOSITE LUBRICANTS, A SLEEVE-TYPE SEAL BASED ON
REINFORCED POLYTETRAFLUOROETHYLENE WAS DEVELOPED AS A
PISTON SEAL FOR HIGH-PRESSURE AIR COMPRESSORS. THE
STATUS OF THE MATERIAL DEVELOPMENT FOR MAXIMIZING THE
EFFECTIVENESS AND LIFE OF THIS SEAL IS REPORTED.
SPECIFICALLY CONSIDERED IS THE USE OF AN ORGANIZED
METALLIC FILAMENT-WINDING TECHNIQUE TO PROVIDE A
SUPERIOR REINFORCING MATRIX AS COMPARED TO THE
RANDOMLY DISPERSED PARTICLES AND FIBERS USED
HERETOFORE. NEW APPROACHES TO COMBINATIONS OF
COMPOSITES FOR THIS AND OTHER APPLICATIONS HAVE BEEN
UNCOVERED. IT IS POSSIBLE TO EXPECT RELIABLE
COMPRESSOR OPERATION AT 5000 PSI USING SUCH SEALS IN
LIEU OF CONVENTIONAL SPLIT RINGS FOR PERIODS BEYOND
1000 HOURS WITH VERY LOW RATES OF WEAR AND AIR
LEAKAGE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-644 038 11/1 11/10
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

A METHOD OF PRODUCING A HEAT-RESISTANT HERMETIC
SEALER BASED ON FLUORINE-RUBBER, (U)

SEP 66 5P FEDOROVA, V. G. STEPANOVA, V.
B. ;
REPT. NO. FTD-HT-66-88

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF
PATENT (USSR) 167 926, APPL. 759814/23/4, 12 JAN
62.

DESCRIPTORS: (*HERMETIC SEALS, *SYNTHETIC RUBBER),
CALCIUM COMPOUNDS, FLUORIDES, ALUMINUM, POWDER
METALS, ZINC COMPOUNDS, CYCLOHEXANONES, HEAT-
RESISTANT MATERIALS, PATENTS, USSR (U)

THE OBJECT OF THE INVENTION IS A METHOD OF
PRODUCING A HEAT-RESISTANT HERMETIC SEALER BASED ON
FLUORINE-RUBBER, FILLERS AND SOLVENTS. TO INCREASE
THE QUALITY OF THE HERMETIC SEALER, 100 PARTS BY
WEIGHT OF FLUORINE-RUBBER (SKF-26), 45 PARTS BY
WEIGHT OF CALCIUM FLUORIDE, 5 PARTS BY WEIGHT OF
ALUMINUM POWDER AND 10 PARTS BY WEIGHT OF ZINC OXIDE
ARE MIXED AND DISSOLVED IN CYCLOHEXANONE TO THE
REQUIRED CONSISTENCY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-659 676 9/1 11/1
AMP INC ELIZABETHTOWN PA CAPITRON DIV

HERMETIC SEALS IN PLASTIC BODIED CONNECTORS, (U)

67 5P JOHNSON, E. ;
REPT. NO. FOLDER-708-7

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ANNUAL WIRE AND CABLE SYMPOSIUM
(16TH), ATLANTIC CITY, N. J.

DESCRIPTORS: (*HERMETIC SEALS, *ELECTRIC
CONNECTORS), PLASTICS, DESIGN, EFFECTIVENESS (U)

PLASTIC BODIES, CONNECTORS AND HEADERS THAT MEET
THE REQUIREMENTS FOR HERMETICALLY SEALED UNITS ARE
AVAILABLE. WHILE SUCH DEVICES CANNOT OFFER THE
SOLUTION TO ALL HERMETIC SEALING PROBLEMS, WJH
CONNECTORS DO HAVE CERTAIN ADVANTAGES, AMONG WHICH
ARE: CHOICE OF MATERIALS DICTATED BY APPLICATION
RATHER THAN APPLICATION LIMITED BY MATERIALS;
CRACKING DUE TO THERMAL SHOCK AND MECHANICAL STRESS
MINIMIZED; SHORTER LEAD-TIME FOR UNUSUAL
CONFIGURATIONS; WIDER RANGE OF GEOMETRIES
PRACTICABLE; HIGHER CONTACT DENSITY; CONTACT PINS
THAT REALLY ARE 'HIGHLY CONDUCTIVE'; CLOSER
DIMENSIONAL TOLERANCES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-684 080 11/1 13/8 13/10
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SEAL SYSTEMS IN HYDROSPACE, PHASE II. CYCLIC
LOADING OF FLANGE AND HATCH SEAL SYSTEMS.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
MAR 69 13P JENKINS, JAMES F. REINHART,
FRED M. ;
REPT. NO. NCEL-TN-1022
PROJ: Y-F38-535-005-01-008

UNCLASSIFIED REPORT

DESCRIPTORS: (*UNDERWATER VEHICLES, *HERMETIC
SEALS), SEA WATER, LIQUID IMMERSION TESTS,
LOADING(MECHANICS), PRESSURE, LIFE EXPECTANCY,
CORROSION INHIBITION, DEFECTS(MATERIALS),
FAILURE(MECHANICS)

(U)

LONG TERM EFFECTS OF HYDROSPACE ON SEALS AND
GASKETS ARE UNDER INVESTIGATION INCLUDING
INVESTIGATION OF THE EFFECTS OF CYCLIC LOADING ON
FIFTEEN SEAL SYSTEMS BY MEANS OF TESTS IN PRESSURE
VESSELS. LONG TERM OCEAN EXPOSURES OF SEAL SYSTEMS
ARE PLANNED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-693 191 11/1 13/9
TENNESSEE UNIV KNOXVILLE DEPT OF MECHANICAL AND AEROSPACE
ENGINEERING

AN INVESTIGATION INTERFACE STABILITY AND ITS
RELATION TO GAS INGESTION IN VISCOSEALS. (U)

DESCRIPTIVE NOTE: DOCTORAL THESIS.
AUG 69 77P FISHER CHARLES F. , JR;
REPT. NO. ME69-T57-6
CONTRACT: N00014-68-A-0144, NGR-43-001-003

UNCLASSIFIED REPORT

DESCRIPTORS: (*HYDRAULIC SEALS, *SHAFTS),
(*BEARINGS, *SEALS), CAVITATION, VISCOSITY,
FLUID DYNAMIC PROPERTIES, REYNOLDS NUMBER, AIR,
INTERFACES, THESES (U)
IDENTIFIERS: *VISCOSEAL BEARINGS (U)

A FUNDAMENTAL STUDY OF THE STABILITY OF A DYNAMIC
GAS-LIQUID INTERFACE BETWEEN ROTATING CYLINDERS IS
REPORTED. THE STUDY WAS INITIATED FOR THE PURPOSE
OF SEEKING FACTORS WHICH HAVE A SIGNIFICANT ROLE IN
THE PROCESS OF GAS INGESTION, OR GAS ENTRAINMENT, IN
VISCOSEALS. THE SIMPLIFIED MODEL OF SMOOTH,
CYLINDRICAL SURFACES WAS SELECTED FOR MATHEMATICAL
TRACTABILITY AND TO PROVIDE A VISUAL STUDY, USING A
TRANSPARENT ACRYLIC HOUSING, WITHOUT THE OBSCURITY OF
THE MORE COMPLEX FLUID FLOW RESULTING FROM THE
PRESENCE OF THE GROOVED SURFACES EMPLOYED IN
VOSCOSEALS. THE VISUAL STUDY WAS SUPPLEMENTED BY
EMPLOYING STROBOSCOPIC PHOTOGRAPHY AND HIGH-SPEED
MOTION PICTURE PHOTOGRAPHY. A PHENOMENOLOGICAL
MECHANISM OF GAS INGESTION WAS ESTABLISHED,
THEORETICALLY AND EXPERIMENTALLY. IT WAS FOUND
THAT GAS ENTRAINMENT CAN RESULT FROM A GAS-LIQUID
INTERFACE INSTABILITY CAUSED BY A VELOCITY OF A
PORTION OF THE INTERFACE TOWARD THE MORE VISCOUS
FLUID AND/OR AN ACCELERATION OF A PORTION OF THE
INTERFACE TOWARD THE MORE DENSE FLUID. RESULTS OF
THE STUDY INDICATE THAT SURFACE TENSION TENDS TO
STABILIZE THE INTERFACE AND PREVENT OR DELAY GAS
INGESTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-708 934 13/8 19/1
AEROPROJECTS INC WEST CHESTER PA

ULTRASONIC WELDING OF PS117 COPPER THIMBLES. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAR 70 36P THOMAS, JOHN G. ;
REPT. NO. RR-70-11
CONTRACT: DAAG39-69-C-0032
PROJ: DA-1-T-662705-A-002, HDL-96094
MONITOR: HDL 0032-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*FUZE FUNCTIONING ELEMENTS, COPPER),
(*ULTRASONIC WELDING, *COPPER), HERMETIC SEALS,
FLANGES, RINGS, TOLERANCES(MECHANICS), TEST
EQUIPMENT, JIGS, SMALL TOOLS, TEST METHODS (U)
IDENTIFIERS: PS-117 THIMBLES (U)

ULTRASONIC RING WELDING WAS INVESTIGATED AS A MEANS FOR PRODUCING LEAKTIGHT CLOSURES OF PS117 COPPER THIMBLE ASSEMBLIES; THESE ASSEMBLIES REPRESENT AN ADVANCE DESIGN PROTOTYPE OF A FLUOBORIC ACID RESERVOIR TO REPLACE THE COMMONLY USED GLASS AMPULE AS A FUZE COMPONENT. THE DRAWN THIMBLE CUP HAS AN ANNULAR GEOMETRY INCORPORATING TWO CONCENTRIC FLANGES TO WHICH THE COVER MUST BE HERMETICALLY SEALED. WHILE THE FEASIBILITY OF SIMULTANEOUS WELDING OF BOTH FLANGES USING A CONCENTRIC WELDING TIP IS THE MOST ECONOMICAL AND CONVENIENT PROCEDURE FOR PRODUCTION, CONSIDERABLE ADDITIONAL EFFORT WILL BE REQUIRED TO DEVELOP THIS TECHNIQUE. HERMETIC SEALS OF GOOD BURST STRENGTH WERE ROUTINELY PRODUCED AT THE OUTER DIAMETER FLANGE, BUT DIFFICULTY WAS EXPERIENCED WITH THE INNER DIAMETER FLANGE WHEN WELDING COVERS THICKER THAN 0.010-INCH. THE PROBLEM WAS ATTRIBUTED TO INSUFFICIENT TORSIONAL AMPLITUDE AT THE SMALL DIAMETER FLANGE. END-ITEM USE OF THE THIMBLE ASSEMBLIES REPORTEDLY REQUIRES COVERS OF GREATER STIFFNESS THAN 0.010-INCH SOFT COPPER--POSSIBLY 0.012-INCH HARD TEMPER OR 0.016-INCH SOFT TEMPER STOCK. SEVERAL APPROACHES INVOLVING EQUIPMENT AND/OR ASSEMBLY GEOMETRY MODIFICATIONS WERE EVOLVED AND RECOMMENDED FOR FUTURE WORK TO PRODUCE THE REQUIRED CLOSURE BY THE SIMULTANEOUS WELDING TECHNIQUE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-709 160 11/1

TENNESSEE UNIV KNOXVILLE DEPT OF MECHANICAL AND AEROSPACE
ENGINEERING

A STUDY OF CONVECTIVE INERTIA EFFECTS AND METHODS OF
CONTROLLING GAS INGESTION IN LARGE DIAMETER
VISCOSEALS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
MAR 70 58P LUTTRULL, LAWRENCE HOWARD ;
REPT. NO. ME70-T57-10
CONTRACT: N00014-68-A-0144, NGR-43-001-003

UNCLASSIFIED REPORT

DESCRIPTORS: (*HYDRAULIC SEALS,
PERFORMANCE(ENGINEERING)), GAS FLOW, BUBBLES,
LEAKAGE(FLUID), PRESSURE, MASS TRANSFER,
CONTROL, ASPECT RATIO (U)
IDENTIFIERS: *VISCOSEALS, *GAS INGESTION (U)

THE STUDY IS CONCERNED WITH THE EFFECT OF TWO
PARAMETERS, CHARACTERISTIC LENGTH AND ASPECT RATIO,
ON THE PERFORMANCE OF LARGE DIAMETER VISCOSEALS, AND
WITH METHODS OF PREVENTING OR CONTROLLING GAS
INGESTION IN THE SAME DEVICE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-713 267 13/11 18/5
NAVAL INTELLIGENCE COMMAND ALEXANDRIA VA TRANSLATION
DIV

HERMETICALLY SEALED PUMPS IN NUCLEAR PROPULSION
PLANTS,

(U)

AUG 70 156P SINEV, N. M. ;UDOVICHENKO,
P. M. ;
REPT. NO. NIC-TRANS-3097

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF MONO. GERMETICHESKIE
VODYANYE NASOSY ATOMNOIKH ENERGETICHESKIKH
USTANOVOK, MOSCOW, 1967 P7-41, 142-166, 204-298.

DESCRIPTORS: (*LIGHT WATER REACTORS, COOLANT
PUMPS), NUCLEAR POWER PLANTS, BOILING WATER
REACTORS, PRESSURIZED WATER REACTORS, FEED WATER,
HERMETIC SEALS, ROTARY PUMPS, STRUCTURAL PARTS,
PERFORMANCE(ENGINEERING), USSR
IDENTIFIERS: TRANSLATIONS

(U)

(U)

THE REPORT DESCRIBES COOLANT PUMPS USED IN NUCLEAR
POWER REACTORS. PERFORMANCE OF VARIOUS
CONFIGURATIONS OF PUMPS MANUFACTURED IN THE UNITED
STATES, GERMANY, AND THE USSR IS ANALYZED.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-721 898 19/6 20/11
WATERVLIET ARSENAL N Y

A TECHNIQUE FOR THE ALTERNATE FIRING AND
CYCLING OF CANNON TUBES.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 71 32P BROWN, BRUCE B. ;
REPT. NO. WVT-7107
PROJ: DA-66656

UNCLASSIFIED REPORT

DESCRIPTORS: (*GUN BARRELS, FATIGUE(MECHANICS)),
INTERIOR BALLISTICS, RIFLING, ROTATING BANDS,
DEFORMATION, CRACKS, CRACK PROPAGATION,
HYDRAULIC SEALS, TEST METHODS, LIFE EXPECTANCY
IDENTIFIERS: *HYDRAULIC CYCLING

(U)

(U)

A TECHNIQUE IS DESCRIBED TO TEST THE CORRELATION OF
FATIGUE EFFECTS IN CANNON TUBES DUE TO HYDRAULIC
CYCLING AND CONVENTIONAL FIRING TESTS. THE
TECHNIQUE IS DEPENDENT ON THE PACKING SYSTEM THAT
EFFECTS A HIGH PRESSURE SEAL ON THE IRREGULAR AND
DAMAGED CANNON BORE SURFACE. THE DEVELOPMENT OF
THIS PACKING SYSTEM IS DISCUSSED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-724 992 13/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

SELF-SEALING SCREW, (U)

JAN 71 6P VERONIS, M. YA. ; LIBERMAN,
L. M. ; YANSON, V. M. ;
REPT. NO. FTD-HT-23-3-71
PROJ: AF-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF PATENT (USSR) 236
165 2P, 1969, BY D. KOOLBECK.

DESCRIPTORS: (*SCREWS, PATENTS), HYDRAULIC
SEALS, POLYMERS, VALVES, USSR (U)
IDENTIFIERS: TRANSLATIONS (U)

THE SELF-SEALING SCREW IS DISTINGUISHED BY THE FACT
THAT IN ORDER TO INCREASE THE HYDRAULIC TIGHTNESS OF
THE JOINT AND TO SIMPLIFY MANUFACTURE IT HAS A RING-
SHAPED RECESS ON THE THREADED SURFACE; THIS RECESS IS
FILLED WITH AN ELASTIC WEAR-RESISTANT POLYMER AND A
THREAD WITH INCREASED AVERAGE DIAMETER IS CREATED ON
THE OUTER SURFACE OF THE POLYMER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-728 216 13/7 1/3
BENDIX CORP SOUTH BEND IND ENERGY CONTROLS DIV

COMPONENT IMPROVEMENT PROGRAM FOR AIRCRAFT
BRAKE PISTON SEALS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. DEC 69-MAY 71,
AUG 71 387 HORNER, RICHARD F. ;
CONTRACT: F33657-70-C-0508
PROJ: WM-9-163-2605
MONITOR: ASD TR-71-43

UNCLASSIFIED REPORT

DESCRIPTORS: (*PISTONS, O-RINGS), (*O-RINGS,
LEAKAGE (FLUID)), (*LANDING GEAR, *HYDRAULIC
BRAKES), MATERIALS, HYDRAULIC SEALS, HYDRAULIC
FLUIDS, OPTIMIZATION, ELASTOMERS, CONFIGURATION,
THERMAL STABILITY, COLD WEATHER TESTS

(U)

HYDRAULIC FLUID LEAKAGE IN AIRCRAFT BRAKES HAS LONG
BEEN A PROBLEM FOR THE AIR FORCE. THIS LEAKAGE
COMMONLY OCCURS WHEN THE EQUIPMENT IS OPERATED IN A
LOW TEMPERATURE ENVIRONMENT. IN SOME CASES, THE
LEAKAGE PROBLEM WAS RESOLVED BY USING SPECIAL
NONSTANDARD 'O' RING SEALS AT A HIGHER COST.
CONSEQUENTLY, IT IS DESIRABLE TO DETERMINE IF A
REVISION TO THE STANDARD GLAND DIMENSIONS WILL
IMPROVE COLD TEMPERATURE PERFORMANCE OF MS-28775
SERIES 'O' RING SEALS. THE PRIMARY PURPOSE OF
THIS INVESTIGATION WAS TO DETERMINE OPTIMUM GLAND
DIMENSIONS FOR USE WITH EXISTING MS-28775 'O'
RING PACKINGS FOR AIRCRAFT BRAKE DYNAMIC SEALS. A
SECONDARY OBJECTIVE WAS TO EVALUATE NEW MATERIALS FOR
SEALS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-729 876 9/5 11/1
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

GROSS LEAK HERMETICITY TESTING
ANALYSIS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT., NOV 69-JUN 70,
AUG 71 39P KILLELEA, JOHN R. FARRELL,
JOHN P. ;
REPT. NO. RADC-TR-71-166

UNCLASSIFIED REPORT

DESCRIPTORS: (*INTEGRATED CIRCUITS, HERMETIC
SEALS), (*HERMETIC SEALS, TEST METHODS),
TESTS, LEAKAGE(FLUID)
IDENTIFIERS: MICROELECTRONICS

(U)

(U)

METHOD 1014, SEAL TEST, OF MIL-STD-883,
STRICTLY DEFINES THE TEST CONDITIONS OF FINE AND
GROSS HERMETICITY TESTING AS THEY PERTAIN TO
MICROCIRCUIT PACKAGES. THE GROSS LEAK TESTS OF
METHOD 1014 AND THE FOLLOWING TWO PROCEDURES ARE
DESCRIBED AND EVALUATED IN THIS REPORT: (1)
WEIGHT TEST, AND (2) ELECTRONIC LEAK
DETECTION. PRIMARY AREAS OF INTEREST WHICH ARE
COVERED INCLUDE THE SENSITIVITY AND REPEATABILITY OF
EACH TEST; SUSCEPTIBILITY TO DESTRUCTION; THE EFFECT
OF PACKAGE CONSTRUCTIONS; AND TEST SELECTION
CRITERIA. COMPLETION OF THIS EFFORT HAS ALLOWED THE
REVISION OF METHOD 1014. THE PRIMARY INTENT OF
THIS REPORT IS TO PROVIDE A SUPPLEMENTAL, DOCUMENTED
GUIDE TO BOTH MICROCIRCUIT MANUFACTURERS AND AIR
FORCE CONTRACTORS ENGAGED IN SCREEN TESTING AND
DEVICE PROCUREMENT, CONCERNING THE SUBJECT SEAL
TEST CONTAINED IN MIL-STD-883. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZCMLS

AD-865 361 11/1 13/10
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SEAL SYSTEMS IN HYDROSPACE, PHASE III:
EFFECTS OF LONG TERM HYDROSPACE EXPOSURE ON
SEAL SYSTEM INTEGRITY. 189 DAYS AT 5,900
FEET.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE APR 68-JUN 69,
JAN 70 48P JENKINS, JAMES F. REINHART,
FRED M. ;
REPT. NO. NCEL-TN-1072
PROJ: YF38.535.005.01.008

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPT. NO. NCEL-TN-1022
DATED MAR 69, AD-684 080.

DESCRIPTORS: (*UNDERWATER VEHICLES, HERMETIC
SEALS), (*HERMETIC SEALS, LIFE EXPECTANCY),
RELIABILITY, LIQUID IMMERSION TESTS, SEA WATER,
O-RINGS, METAL SEALS, LEAKAGE (FLUID),
CORROSION INHIBITION, JIGS, TEST METHODS
IDENTIFIERS: LIP SEALS

(U)

(U)

LONG TERM EFFECTS OF HYDROSPACE ON SEALS AND
GASKETS ARE UNDER INVESTIGATION AT NCEL (NAVAL
CIVIL ENGINEERING LABORATORY). PHASE III
INCLUDES THE EVALUATION OF FIFTEEN SEAL SYSTEMS AND
FIVE METALLIC SEAL FLANGE MATERIALS AFTER EXPOSURE TO
THE MARINE ENVIRONMENT FOR 189 DAYS AT A DEPTH OF 5,
900 FEET IN THE PACIFIC OCEAN. (AUTHOR)

(U)

V. METAL SEALS

6-4a

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDHL5

AD-235 831

MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND
TECHNOLOGY

THE PHASE DIAGRAM FOR THE BINARY SYSTEM
CADMIUMTELLURIUM

(U)

APR 60 31P MASON, DONALD R.; KULWICKI, BERNARD H.;
REPT. NO. 2900 139 R
CONTRACT: DA36 039SC78801
MONITOR: NAVNEPS 6842

UNCLASSIFIED REPORT

DESCRIPTORS: *CADMIUM, *METAL SEALS, *PHASE STUDIES,
*SEMICONDUCTORS, *TELLURIUM, CADMIUM COMPOUNDS,
EUTECTICS, TELLURIDES, THERMODYNAMICS

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-248 535

SPERRY GYROSCOPE CO GREAT NECK N Y

METAL-TO-CERAMIC SEAL TECHNOLOGY STUDY

(U)

OCT 60 105P COLE, S. S. JR. (LARISCH, N. W.)
MONITOR: RADG TR-60-236

UNCLASSIFIED REPORT

DESCRIPTORS: *CERAMIC MATERIALS, *ELECTRON TUBES, *METAL
SEALS, *SEALS (STOPPERS), ALUMINUM COMPOUNDS, ANALYSIS,
BONDING, BRAZING, GLASS, MECHANICAL PROPERTIES, METALS,
OXIDES, SINTERING, STRESSES (U)

A LITERATURE SURVEY ON CERAMIC-TO-METAL SEALING
TECHNIQUES, ADHERENCE THEORY, AND ALLIED SYSTEMS
DISCLOSED LIMITED PUBLISHED WORK AND NO PROCEDURES
FOR ACHIEVING ULTRA-HIGH-STRENGTH SEALS OR SEALS TO
PURE HIGH ALUMINA. TWO ADDITIONAL THEORIES WERE
FORMULATED FOR THIS STUDY--ONE PROPOSING THE
MIGRATION OF THE GLASS IN THE CERAMIC (OVER) INTO
THE METALLIZING MIXTURE, AND THE OTHER RECOGNIZING
THE NEED FOR PROMOTING METALLIZED SINTERING. THREE
SINTERING TEMPERATURES WERE CHOSEN, DEPENDING ON
COMPOSITION, FOR EACH OF THE 200 METALLIZING
MIXTURES. EACH MIXTURE WAS APPLIED TO SPECIMENS OF
94-, 96-, AND 99.6-PERCENT ALUMINA. TESTING
INVOLVED A SCREENING TECHNIQUE WHEREBY THE MOST
PROMISING COMPOSITIONS WERE CARRIED THROUGH TO
INCREASINGLY REFINED TEST TECHNIQUES (SCRATCH AND
PEEL, CIRCUMFERENTIAL SEAL, AND FINALLY TENSILE
TESTS). THE TENSILE TEST SPECIMEN WAS REDESIGNED
TO ELIMINATE SHOULDER BREAKS WHEN EVALUATING ULTRA-
HIGH-STRENGTH SEALS. EXTREMELY STRONG SEALS WERE
DEVELOPED FOR ALL THE CERAMIC BODIES CONSIDERED. A
WIDE VARIETY OF SEALING COMPOSITIONS WAS DISCLOSED
WHICH PRODUCED SEALS STRONGER THAN THOSE PREVIOUSLY
REPORTED. A METHOD TO CALCULATE STRESSES IN
CERAMIC-TO-METAL SEALS IS THEORIZED. MEASUREMENTS
OF THE PROPERTIES OF THE METAL AND OF RESIDUAL
STRESSES IN SEALS WERE MADE, SHOWING EXCELLENT
AGREEMENT WITH CALCULATED STRESSES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-258 893
COAST GUARD WASHINGTON D C

TESTS OF PARKER RING SEAL FOR BUOY POCKETS (U)

JUN 61 1V
REPT. NO. 242

UNCLASSIFIED REPORT

DESCRIPTORS: *BUOYS, *GASKETS, *METAL SEALS, *RUBBER
GASKETS, *RUBBER SEALS, *SEALS (STOPPERS), ALUMINUM,
DESIGN, RINGS, TESTS (U)

TESTS WERE CONDUCTED TO DETERMINE THE SUITABILITY
OF A PARKER RING SEAL FOR USE AS A CLOSURE
GASKET IN BUOY POCKETS. THE GASKET ASSEMBLY
CONSISTS OF AN ALUMINUM FLAT RING HAVING A 24-INCH
I. D. AND 30-1/2-INCH O. D. WITH A NEOPRENE
RUBBER RING INSERT. THE RING SEAL WAS INSTALLED
IN A MOCK-UP BUOY POCKET AND AIR TESTED TO ONE
ATMOSPHERE. FIRE HOSE AND WATER SUBMERGENCE TESTS
WERE ALSO PERFORMED. IT WAS CONCLUDED THAT THE
PARKER RING SEAL GASKET WAS ADEQUATE FOR USE IN
COAST GUARD BUOY POCKETS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-259 803

ARMY ENGINEER REACTORS GROUP FORT BELVOIR VA

PRELIMINARY INVESTIGATION OF SM-1 CONTROL ROD SEAL
FAILURE

(U)

APR 61 1V KNIGHTON, G.W. I
REPT. NO. AERG-OSB-15

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REVISION 1 DATED 16 JUN 61,
AD-265 582.

DESCRIPTORS: *CONTROL RODS, *METAL SEALS, *REACTOR
SAFETY SYSTEMS, *SEALS (STOPPERS), CORROSION, FAILURE
(MECHANICS), NEUTRON ABSORBERS, NUCLEAR POWER PLANTS,
PLATING, REACTOR CONTROL, RESEARCH REACTORS, RODS (U)

ON 26 MARCH, THE SM-1 PLANT EXPERIENCED
EXCESSIVE CONTROL ROD DRIVE SEAL LEAKAGE RATE.
DURING A VAPOR CONTAINER ENTRY FOR INSTRUMENTATION
CHECK, THE LEAKAGE RATE FROM EACH SEAL WAS MEASURED.
THE MAXIMUM RATE WAS FOUND TO BE 6.3 GALLONS PER
HOUR COMPARE 7 GPH. TWO SEALS WERE REPLACED WITH
REBUILT ASSEMBLIES. THIS REDUCED LEAKAGE RATES TO
ANALLOWABLE OPERATING RATE. SHIM NO. 3 SEAL WAS
FOUND PLUGGED, AND BACK FLUSHING ELIMINATED THE
PLUGGING. VISUAL INSPECTION OF THE DISASSEMBLED
ROD-B SEAL INDICATED LEAKAGE INCREASE WAS DUE TO
THE INCREASED CLEARANCE PROBABLY CAUSED BY
OVERHEATING DUE TO LOSS OF COOLING WATER AT VARIOUS
TIMES IN THE OPERATING PERIOD. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-265 582

ALCO PRODUCTS INC SCHENECTADY N Y

INSPECTION OF SM-1 CONTROL ROD SEAL COMPONENTS (U)

DESCRIPTIVE NOTE: FINAL REPT.,

JUN 61 IV CHITTUM, R.A.; SACCOCIO, R.M.

REPT. NO. NOTE-362

CONTRACT: DA44 192ENG17

MONITOR: AERG OSB-10-REV-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REVISION 1 TO REPORT DATED 18 APR
61, AD-259 803.

DESCRIPTORS: *CONTROL RODS, *METAL SEALS, CHEMICAL
ANALYSIS, COOLANTS, CORROSION, DRIVE SHAFTS, FAILURE
(MECHANICS), LIQUID ROCKET PROPELLANTS, MICROSCOPY,
NEUTRON ABSORBERS, NUCLEAR POWER PLANTS, PLATING,
PRESSURE, RADIOGRAPHY, RESEARCH REACTORS, SCALE, SEALS
(STOPPERS), SHAFTS, STAINLESS STEEL, TESTS, WATER (U)

A LABORATORY TEST WAS COMPLETED TO CHECK LEAKAGE
RATES OF A CONTROL ROD DRIVE SEAL ASSEMBLY (SHAFT,
SEAL RINGS AND DIAPHRAGMS) WHICH HAD BEEN IN
OPERATION IN THE SM-1 SINCE ITS ORIGINAL STARTUP.
THE TESTING WAS PERFORMED AT SIMULATED REACTOR
OPERATING PRESSURE (1200 PSI) AND ROOM
TEMPERATURE TO DETERMINE THE LEAKAGE RATE WITH THE
SEAL CORRECTLY ASSEMBLED AND WITH IT ASSEMBLED AS IT
HAD BEEN DURING REACTOR OPERATION I.E., THE FIRST
DIAPHRAGM AND SEAL RING TURNED AROUND ON THE SEAL
SHAFT. NO MEASURABLE WEAR WAS FOUND WHEN THE
COMPONENTS WERE MEASURED. MICROGRAPHICAL
EXAMINATION OF THE CR PLATE ON A SEAL SHAFT
REMOVED FROM THE SM-1 SHOWED CONSIDERABLE PITTING,
CORROSION AND EROSION UNDER AND ADJACENT TO SOME OF
THE STELLITE RING AREAS. THE MOST LIKELY CAUSE OF
REMOVAL OF THE CR PLATE WAS THE POOR QUALITY
PLATING AND INADEQUATE PREPLATE CLEANING WHICH
RESULTED IN NON-METALLIC INCLUSIONS IN THE MATERIAL.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-265 775

WHITTAKER CORP SAN DIEGO CALIF NARMCO RESEARCH AND
DEVELOPMENT DIV

DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE
SYSTEM

(U)

JAN 61 IV BASSETT, WILLIAM LONG, ROGER A.
CONTRACT: NOAS60 6061

UNCLASSIFIED REPORT

DESCRIPTORS: *ADHESIVES, *BONDING, *HONEYCOMB CORES,
*METAL SEALS, *SANDWICH PANELS, ADHESION, BONDED JOINTS,
COPPER COMPOUNDS, DIOXIDES, HEAT TRANSFER, HEATING,
HIGH-PRESSURE RESEARCH, HIGH-TEMPERATURE RESEARCH,
MATERIALS, MECHANICAL PROPERTIES, METAL JOINTS,
MIXTURES, OXIDES, PROCESSING, SEALS (STOPPERS), SHEETS,
SILICON COMPOUNDS, SILVER COMPOUNDS, STAINLESS STEEL (U)

THE OVERLAP BONDING EVALUATION OF ALL EXOTHERMIC
ADHESIVE BONDING WAS COMPLETED. RESULTS INDICATED
THE BONDS WERE SUFFICIENTLY DUCTILE TO WITHSTAND
MECHANICAL SHOCK AND TO RESIST PEEL. PROCEDURES FOR
FABRICATING HONEYCOMB PANELS UP TO 2- X 2-IN WERE
DEVELOPED AND SPECIFICATIONS WRITTEN. PROCEDURES
FOR FABRICATING - X 4-IN. AND 3- X 8-IN PANELS WERE
BEING DEVELOPED AT REPORT TIME. AT THE END OF THIS
QUARTER AND BECAUSE OF THE CONTRACT TIME SHORTAGE, IT
WAS FOUND NECESSARY TO EMPLOY AN AUXILIARY EXTERNAL
EXOTHERM TO PRODUCE GOOD HONEYCOMB BONDING WITHOUT
BURNING SMALL HOLES IN THE CORE CELL WALLS.
(AUTHOR)

(U)

70
UNCLASSIFIED

/ZDML5

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-265 776

WHITTAKER CORP SAN DIEGO CALIF NARMCO RESEARCH AND
DEVELOPMENT DIV

DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE
SYSTEM

(U)

OCT 60 IV BASSETT, WILLIAM; LONG, ROGER A.
CONTRACT: NOAS60 6061

UNCLASSIFIED REPORT

DESCRIPTORS: *ADHESIVES, *BONDING, *HONEYCOMB CORES,
*METAL SEALS, *SANDWICH PANELS, ADHESION, BONDED JOINTS,
COPPER COMPOUNDS, DIOXIDES, HIGH-PRESSURE RESEARCH,
HIGH-TEMPERATURE RESEARCH, IMPACT SHOCK, MATERIALS,
MECHANICAL PROPERTIES, METAL JOINTS, MIXTURES, OXIDES,
SEALS (STOPPERS), SHEAR STRESSES, SHEETS, SILICON
COMPOUNDS, SILVER COMPOUNDS, STAINLESS STEEL, TESTS (U)

THE REFINEMENT OF THE CU AND AG BASED
EXOTHERMIC ADHESIVE SYSTEMS FOR OVERLAP BONDING,
FABRICATING OVERLAP SPECIMENS SPECIFIED IN THE
CONTRACT WAS COMPLETED. THE DEVELOPMENT OF AN
EXOTHERMIC ADHESIVE COMPOSITION AND ASSOCIATED
PROCEDURES FOR HONEYCOMB PANEL BONDING CONTINUED.
STAINLESS STEEL LAP SHEAR STRENGTHS USING AG BASE
EXOTHERMS WERE CONSISTENTLY ABOVE 5300 PSI WITH MOST
FAILURES IN THE STAINLESS PARENT METAL. THE AVERAGE
STRENGTH BEING 9173 PSI. NO APPRECIABLE CHANGE IN
STRENGTH WAS NOTED UP TO 600 F. AT 800 F THIS
AVERAGE WAS 8941 PSI. BEND TESTS DEMONSTRATED THE
BONDS WERE METALLIC, WITH LITTLE OR NO INCLUDED
GLASS. HONEYCOMB CORE CELL BONDING TO SKINS WAS
ACHIEVED BUT CORE CELL BURN THROUGH, ALTHOUGH GREATLY
REDUCED, STILL REMAINED A PROBLEM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMLS

AD-266 158

SPERRY GYROSCOPE CO GREAT NECK N Y

CERAMIC-METAL SEALS FOR HIGH-POWER TUBES (U)

JUL 61 IV COLE, S. S. JR. INCLINDEN, J. E. I

UNCLASSIFIED REPORT

DESCRIPTORS: • CERAMIC MATERIALS, • ELECTRON TUBES, • METAL
SEALS, ALUMINUM COMPOUNDS, BONDING, HEAT TREATMENT,
MATERIALS, METALS, OXIDES, RELIABILITY, RUPTURE, SEALS
(STOPPERS), STRESSES, TENSILE PROPERTIES (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-271 429

WHITTAKER CORP SAN DIEGO CALIF NARMCO RESEARCH AND
DEVELOPMENT DIV

DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE
SYSTEM

(U)

JAN 61 IV BASSETT, WILLIAM CAUGHEY, ROBERT LONG,
ROGER A. J

CONTRACT: NOA560 6061

UNCLASSIFIED REPORT

DESCRIPTORS: *ADHESIVES, *HONEYCOMB CORES, *METAL SEALS,
*SANDWICH PANELS, *STAINLESS STEEL, BONDED JOINTS,
BONDING, BRAZING, CERAMIC MATERIALS, COMPRESSIVE
PROPERTIES, COPPER ALLOYS, GLASS, HIGH-PRESSURE
RESEARCH, HIGH-TEMPERATURE RESEARCH, MATERIALS,
MECHANICAL PROPERTIES, METAL JOINTS, PROCESSING, SHEETS,
SILVER ALLOYS, TENSILE PROPERTIES (U)

COMBINATION METAL-OXIDE AND METAL-GLASS EXOTHERMIC
SYSTEMS WERE DEVELOPED. THESE EXOTHERMIC AG BASE
AND CU BASE ADHESIVES GAVE METALLIC BONDS WHICH ON
THE BASIS OF STAINLESS STEEL TENSILE LAP SHEAR
STRENGTHS SHOWED STRENGTHS IN EXCESS OF 9000 PSI AT
ALL TEMPERATURES UP TO 800 F. THE PROCESS
CONSISTED OF COMBINING REACTIVE AND INERT
CONSTITUENTS THAT PRODUCED A FLUID GLASS, WHICH COULD
BE SQUEEZED OUT OF THE BOND AREA, AND A STAINLESS
STEEL WETTING ALLOY THAT REMAINED IN THE BOND AREA AS
A BRAZE FILLER METAL. THE ADAPTATION OF THE AG
BASE EXO-REACTANT ADHESIVE SYSTEMS TO STAINLESS STEEL
HONEYCOMB PANEL BONDING WAS ACCOMPLISHED.
EXOTHERMIC ADHESIVE BONDED STAINLESS STEEL 15-7
MO HONEYCOMB PANELS WERE EVALUATED AND COMPARED
WITH EQUIVALENT TESTED CONVENTIONALLY BRAZED PANELS.
THE EXOTHERMICALLY BONDED STAINLESS STEEL PANELS
GAVE FLEXURE AND EDGEWISE COMPRESSION STRENGTHS OF
84,300 AND 61,900 COMPARED TO 160,000 AND 116,000
PSI, RESPECTIVELY, PROVIDED BY THE CONVENTIONALLY
FURNACE BRAZED PANELS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-272 888

CHANCE VOUGHT CORP DALLAS TEX

ABSTRACTS OF MATERIAL EVALUATION PROGRAMS CONDUCTED
AT CHANCE VOUGHT CORPORATION (U)

FEB 62 IV PETERSON, J.J.
REPT. NO. 2 53420 2R371
CONTRACT: AF33 616 7986

UNCLASSIFIED REPORT

DESCRIPTORS: *ALUMINUM ALLOYS, *BLACKBODY RADIATION,
*CERAMIC COATINGS, *GLASS TEXTILES, *METAL SEALS,
*PHOTOELASTICITY, AIRCRAFT CANOPIES, ANTIOXIDANTS,
CASTINGS, COATINGS, CORROSION, DIFFUSION, FATIGUE
(MECHANICS), HEAT RESISTANT METALS + ALLOYS, HYDRAULIC
SYSTEMS, MARINE ENGINES, MECHANICAL PROPERTIES, NICKEL
ALLOYS, NIOBIUM ALLOYS, OXIDES, SHEETS, STRESSES,
ZIRCONIUM COMPOUNDS (U)

71

UNCLASSIFIED

/ZDML5

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-275 082

ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

CERAMIC-METAL SEALS FOR HIGH-PRESSURE TUBES

(U)

NOV 61

IV

STYHR, K.H.; FERELLO, A.S.

UNCLASSIFIED REPORT

DESCRIPTORS: CERAMIC MATERIALS, ELECTRON TUBES, METAL SEALS, BRAZING, CHEMICAL MILLING, COATINGS, DESIGN, IONIZATION GAGES, LIFE EXPECTANCY, MANUFACTURING METHODS, METALS, PROCESSING, RELIABILITY, RUPTURE, SEALS (STOPPERS), SPRAY NOZZLES, STRESSES, TENSILE PROPERTIES, TEST EQUIPMENT, TEST METHODS (U)

IT WAS ILLUSTRATED THAT A STATISTICAL APPROACH, BASED ON AN ANALYSIS OF VARIANCE OF BASIC FACTORIAL DESIGN, CAN BE APPLIED TO A SYSTEMATIC STUDY OF THE PARAMETERS EFFECTING THE RELIABILITY OF CERAMIC-TO-METAL SEALS. AN EXPERIMENT HAS SHOWN THAT 2 TYPES OF NICKEL PLATING USED ON 2 TYPES OF CERAMIC, AT 2 DIFFERENT THICKNESSES, WILL YIELD NO SIGNIFICANT DIFFERENCE IN SEAL STRENGTH. IT WAS CONCLUDED THAT ECONOMY CONSIDERATIONS SHOULD GOVERN THE TYPE AND THICKNESS OF PLATING USED ON METALLIZED CERAMICS. AXIAL ALIGNMENT OF THE CERAMIC TEST SPECIMEN WAS SHOWN TO BE OF MAJOR IMPORTANCE IN OBTAINING REPRODUCIBLE TENSILE TEST DATA ON CERAMIC-TO-METAL SEAL STRENGTH. TWO METHODS WERE FOUND USEFUL IN THE DETECTION OF LEAK PATHS IN CERAMIC-METAL ASSEMBLIES. THE FIRST IS THE DEPOSITION OF CARBONACEOUS MATERIAL BY THE DECOMPOSITION OF A HYDROCARBON IMPREGNATED IN THE LEAK. THE SECOND IS THE DEPOSITION OF METAL IN THE LEAK PATH FROM A GASEOUS PHASE. IT IS CONCLUDED THAT BOTH METHODS CAN BE APPLIED TO A METALLOGRAPHIC EXAMINATION TECHNIQUE WHICH WILL ALLOW A CATEGORIZING OF LEAK PATHS. A NON-PUMPING, COLD CATHODE IONIZATION GAGE FOR USE AS A LIFE TEST VEHICLE IS DESCRIBED AND IS BEING FABRICATED FOR TESTING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMLS

AD-277 427

ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

CERAMIC-METAL SEALS FOR HIGH-POWER TUBES

(U)

MAR 62 IV STYHR, K. JR.; WARAKSA, I.; MURPHY, J. A.;

UNCLASSIFIED REPORT

DESCRIPTORS: *ELECTRON TUBES, *METAL SEALS, BRAZING,
CERAMIC MATERIALS, CHEMICAL MILLING, COATINGS,
IONIZATION GAGES, MANUFACTURING METHODS, METALS,
PLATING, PROCESSING, RELIABILITY, RUPTURE, SINTERING,
STRESSES, TENSILE PROPERTIES, TEST EQUIPMENT, TEST
METHODS (U)

PROGRESS REPORT ON DESIGN OF CERAMIC-METAL SEALS
FOR HIGH POWER TUBES. MANUFACTURING METHODS;
PROCESSING; DESIGN; RELIABILITY STUDIES.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-283 410

GENERAL DYNAMICS/FORT WORTH TEX

MATERIAL-ACCESS DOOR SEALANT-SCREENING AND EVALUATION
OF- (U)

MAY 62 IV PRICE, H.M.I
REPT. NO. FGT 1632
CONTRACT: AF 33(038)-2,250, AF 33(657)-7248

UNCLASSIFIED REPORT

DESCRIPTORS: *FUEL TANKS, *METAL SEALS, *SEALING
COMPOUNDS, *SEALS (STOPPERS), ADHESION, AIRPLANE PANELS,
ALUMINUM, HIGH-TEMPERATURE RESEARCH, JET BOMBERS, LOW
TEMPERATURE RESEARCH, TESTS (U)
IDENTIFIERS: B-58 AIRCRAFT, TENNESSEE (U)

THREE LP-2 TYPE MATERIALS (X-464612, X-464626,
X-464645) WERE TESTED AS ACCESS DOOR SEALANTS IN
THE B-58 INTEGRAL FUEL TANKS. AS THERE WERE NO
SPECIFICATIONS COVERING SUCH MATERIALS, SEVERAL TEST
PROCEDURES CONSIDERED APPLICABLE TO THIS TYPE OF
MATERIAL WERE SELECTED FROM PRESENTLY AVAILABLE HIGH
TEMPERATURE SEALANT SPECIFICATIONS, FMS-0008 AND
MIL-S-8802. TESTS INCLUDE TENSILE STRENGTH, %
ELONGATION, APPLICATION TIME, FLOW AND LOW
TEMPERATURE FLEXIBILITY, RESISTANCE TO HEAT, PRESSURE
AND FUEL IN A TYPICAL FAYING SURFACE APPLICATION.
X-464645 WAS CONSIDERED THE MOST SUITABLE FOR USE
AS ACCESS DOOR SEALANTS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMLS

AD-285 106

ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

CERAMIC-METAL SEALS FOR HIGH-POWER TUBES (U)

JUN 62 IV JOHNSON, C. I. WARASKA, I. I. CHEATHAM, E. I.

UNCLASSIFIED REPORT

DESCRIPTORS: •ELECTRON TUBES, •METAL SEALS, BRAZING,
CERAMIC MATERIALS, CHEMICAL MILLING, IONIZATION GAGES,
LIFE EXPECTANCY, MANUFACTURING METHODS, METALS,
PROCESSING, SINTERING, TENSILE PROPERTIES, TESTS (U)

STUDY WAS CONTINUED ON CERAMIC-TO-METAL SEALS FOR
HIGH-POWER TUBES. TEST RESULTS WERE RECORDED FOR
1425 C, 1500 C, AND 1575 C SINTERING AND FOR 4-
, 6-, AND 8-HOUR TEMPERATURE CYCLES. THERE DOES NOT
APPEAR TO BE A SYSTEMATIC INCREASE IN AVERAGES WITH
AN INCREASE IN TEMPERATURE, NOR DOES ANY TEMPERATURE
CYCLE SHOW DEFINITIVE RESULTS. INVESTIGATIONS ARE
IN PROGRESS TO CORRELATE ECCENTRICITY OF THE ALVES
OF TEST SAMPLES WITH CHANGES IN TENSILE STRENGTH.
A MODIFIED NONPUMPING ION GAGE WAS DESIGNED WHICH
IS EXPECTED TO ELIMINATE SPUTTERING. SIXTY
CERAMIC-TO-METAL ASSEMBLIES OF A TYPICAL WINDOW
DESIGN WERE MADE, WITH A YIELD OF 83% BEING
VACUUM-TIGHT. THE LEAKERS ARE UNDERGOING ANALYSIS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMLS

AD-291 984

IIT RESEARCH INST CHICAGO ILL

COMPOSITE INORGANIC RESILIENT SEAL MATERIALS

(U)

JUN 62 IV IWATSUKI, F. SMITH, L. L.
CONTRACT: AF33 616 7310

UNCLASSIFIED REPORT

DESCRIPTORS: *COMPOSITE MATERIALS, *INORGANIC COMPOUNDS,
*METAL SEALS, *SEALS (STOPPERS), CRYOGENICS, DYNAMICS,
ELASTOMERS, FIBERS, FLEXIBLE SHAFTS, FOILS, GASKETS,
HIGH-PRESSURE RESEARCH, HIGH-TEMPERATURE RESEARCH,
IMPREGNATION, LOW-PRESSURE RESEARCH, METAL FILMS,
MOLYBDENUM, NICKEL, RINGS, RUBBER SEALS, SHAFTS, SILVER,
SPACECRAFT, STAINLESS STEEL, STATICS, TIN ALLOYS (U)
IDENTIFIERS: O RINGS (U)

RESEARCH WAS CONDUCTED TO INVESTIGATE AND DEVELOP
COMPOSITE MATERIALS FOR USE AS STATIC AND DYNAMIC
SEALS AT TEMPERATURES RANGING FROM CRYOGENIC TO 2000
F, AND AT PRESSURES UP TO 5000 PSI. EMPHASIS IS
BEING PLACED ON DYNAMIC SEALS FOR ROTATING AND
RECIPROCATING SHAFTS COVERING THE TEMPERATURE RANGE -
320 TO 1500 F AND ON LOW TEMPERATURE, LOW
CLAMPING FORCE STATIC SEALS FOR SEALING THE CABINS OF
SPACE VEHICLES. EFFORTS INCLUDED HIGH TEMPERATURE
EVALUATION OF LARGE STATIC RINGS, CRYOGENIC
EVALUATION OF STATIC SEALS, DYNAMIC FIXTURE DESIGN,
AND SAMPLE PREPARATION FOR THE DETERMINATION OF
MECHANICAL PROPERTIES AT ELEVATED TEMPERATURES.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMLS

AD-404 088

SPEYRY GYROSCOPE CO GREAT NECK N Y

CERAMIC-METAL SEALS FOR HIGH-POWER TUBES.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 10 APR 61-31

OCT 62,

JAN 63 86P JOHNSON, C. I. WARASKA, I. I.

COLE, S. I. STYHR, K. I. CHEATHAM, E. I.

REPT. NO. NAB253 8331

CONTRACT: AF30 822 2371

PROJ: 5573

TASK: 557303

MONITOR: RADC

TDR63 43

UNCLASSIFIED REPORT

DESCRIPTORS: •METAL SEALS, •CERAMIC MATERIALS,
•MANUFACTURING METHODS, QUALITY CONTROL, FAILURE
MECHANICS, RELIABILITY, ELECTROPLATING,
SINTERING, BRAZING, COATINGS, LIFE EXPECTANCY,
PROCESSING, ELECTRON TUBES.

(U)

VARIABLES ASSOCIATED WITH THE FABRICATION OF METAL-
TO-CERAMIC SEALS WERE INVESTIGATED TO UNDERSTAND THE
MECHANISMS OF FAILURES AND TO IMPROVE MANUFACTURING
PROCESSES. THE PROGRAM PRIMARILY INVOLVED AN
EXTENSIVE RELIABILITY STUDY IN WHICH CERAMIC BODIES,
METALLIZING MIXTURES, PLATING, SINTERING, BRAZING,
AND OTHER SEALING PRACTICES WERE STATISTICALLY
EVALUATED. ENVIRONMENTAL, LIFE, AND LEAK PATH
STUDIES SUPPORTED THE PRIMARY INVESTIGATIONS.
RECOMMENDED MANUFACTURING PROCEDURES AND CONTROLS
WERE INCORPORATED INTO A MANUAL ON METAL-TO-CERAMIC
SEALING TECHNIQUES. AN OPERATING NONPUMPING ION
GAGE WAS CONSTRUCTED. (AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMLS

AD-409 160

RADIO CORP OF AMERICA LANCASTER PA INDUSTRIAL TUBE AND
SEMICONDUCTOR DIV

DIELECTRIC TO METAL SEAL TECHNOLOGY STUDY. (U)

DESCRIPTIVE NOTE: QUARTERLY INTERIM TECHNICAL REPT. NO.
3.

MAY 63 61P GRIMM, A.C. ISTRUBHAR, P.D.I

CONTRACT: AF30 602 2682

PROJ: 5573

TASK: 557303

MONITOR: RADC

TDR63 249

UNCLASSIFIED REPORT

DESCRIPTORS: (*DIELECTRICS, SEALS), (*METAL
SEALS, DIELECTRICS), ELECTRON LENSES, METAL
COATINGS, SINTERING, PLATING, SAPPHIRES,
SURFACE PROPERTIES, MOLYBDENUM, TUNGSTEN,
BRAZINE, ADDITIVES, POWDERS, CERAMIC MATERIALS,
OXIDES, BERYLLIUM COMPOUNDS, ALUMINUM COM
POUNDS, SILICON, MIXTURES, FLUORIDES. (U)

IDENTIFIERS: 1962, RENE-41, WASPALLAY, COM
PRESSION BAND WINDOW, METALLIZING, PYROCERAM 9606,
COMPRESSION BAND SEALS. (U)

A NUMBER OF SEAL STRENGTH TESTS WERE PERFORMED TO
DETERMINE THE EFFECTS OF PLATING-METALIZING
COMBINATIONS ON SEAL STRENGTH. VARIOUS PRO
PORTIONS OF MOLYBDENUM AND RCA S-641A METALIZING
MIXTURES AS WELL AS TUNGSTEN AND RCA S-641A
METALIZING MIXTURES WERE TRIED ON SAPPHIRE IN ORDER
TO FIND THE OPTIMUM MIXTURE. A SERIES OF MIGRATION
STUDIES WAS MADE, USING ELECTRON BEAM TECHNIQUES, IN
AN EFFORT TO BETTER UNDERSTAND THE MIGRATION OF
VARIOUS ELEMENTS IN THE SEALS AND THE EFFECT OF THIS
MIGRATION ON SEAL STRENGTH. COMPRESSION-BAND
WINDOW ASSEMBLIES HAVING DIELECTRIC DISCS MADE FROM
BERYLLIUM OXIDE, BORON NITRIDE, MAGNESIUM FLUORIDE,
PYROCERAM 9606, PYROCERAM XM-1, AND SAPPHIRE
WITH A 60 DEGREE CRYSTAL ORIENTATION WERE MADE AND
EVALUATED. TESTS HAVE VERIFIED THAT COMPRESSION
BANDS FABRICATED FROM RENE 41, WASPALLOY, OR
MOLYBDENUM WILL MEET WINDOW DESIGN OBJECTIVES.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMLS

AD-419 783

RADIO CORP OF AMERICA LANCASTER PA INDUSTRIAL TUBE AND
SEMICONDUCTOR DIV

DIELECTRIC TO METAL SEAL TECHNOLOGY STUDY. (U)

DESCRIPTIVE NOTE: QUARTERLY INTERIM TECHNICAL REPT. NO. 4.

JUL 63 74P GRIMM, A. C. ; STRUBHAR, P. D.

CONTRACT: AF30 602 2682

PROJ: 5573

TASK: 557303

MONITOR: RADC TDR63 393

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*MICROWAVE EQUIPMENT, VACUUM SEALS),
(*METAL SEALS, MICROWAVE EQUIPMENT), (*CERAMIC
MATERIALS, SEALS (STOPPERS)), (*DIELECTRICS, SEALS
(STOPPERS)), TEST METHODS, REFRACTORY METALS AND
ALLOYS, BERYLLIUM COMPOUNDS, SAPPHIRES, OXIDES, BORON
COMPOUNDS, NITRIDES, MAGNESIUM COMPOUNDS, FLUORIDES,
MOLYBDENUM COMPOUNDS, MOLYBDENUM, PARTICLE SIZE,
DISTRIBUTION, RUPTURE, FAILURE (MECHANICS), TESTS,
HIGH-TEMPERATURE RESEARCH, ALLOYS, MATERIALS, TABLES,
TUNGSTEN, FRACTURE (MECHANICS), MICROWAVES (U)
IDENTIFIERS: PYROCERAM, METALIZING, MICROWAVE TUBE
WINDOWS, 1963 (U)

THIS REPORT COVERS THE FOURTH QUARTER OF WORK UNDER
A 19-MONTH PROGRAM TO CONDUCT A THEORETICAL AND
EXPERIMENTAL INVESTIGATION LEADING TO THE DEVELOPMENT
OF IMPROVED DIELECTRIC-TO-METAL SEALS AND SEALING
TECHNIQUES FOR USE WITH OUTPUT WINDOWS FOR HIGH-POWER
MICROWAVE TUBES. THE USE OF FINER MOLYBDENUM,
TUNGSTEN, AND 5-641A PARTICLE SIZES IN THE
METALIZING INKS EMPLOYED IN THE SAPPHIRE-REFRACTORY
METAL SEALS WAS INVESTIGATED. SEAL SLEEVES OF
THICKER COPPER AND COPPER-PLATED STAINLESS STEEL,
KOVAR, AND NICKEL WERE EVALUATED FOR COMPRESSION-
BAND WINDOW ASSEMBLIES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMLS

AD-602 144

HELPAIR INC FALLS CHURCH VA

2000F POWER WIRE FOR AEROSPACE ENVIRONMENT.

(U)

DESCRIPTIVE NOTE: QUARTERLY REPT. NO. 5, 5 APR-5 JUL 64.

JUL 64 30P

CONTRACT: AF33 657 11046

PROJ: 8128

TASK: 812806

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•METAL SEALS, BRAZING), (•ELECTRIC WIRE, METAL SEALS), HIGH TEMPERATURE RESEARCH, AERONAUTICS, CERAMIC MATERIALS, ALUMINUM, MAGNESIUM, OXIDES, VOLTAGE, OXIDATION, TESTS, CLEANING, TEST EQUIPMENT, COOLING, ELECTRIC INSULATION, VACUUM APPARATUS (U)
IDENTIFIERS: ALUMINUM OXIDES, MAGNESIUM OXIDE (U)

A BRAZING STUDY WAS UNDERTAKEN TO PRODUCE RELIABLE END SEALS FOR POWER WIRE SYSTEMS. THE BEST RESULTS WERE OBTAINED WITH 99.5 PERCENT DENSE ALUMINA END PLUGS, VACUUM BRAZED UNDER CONTROLLED HEATING, COOLING, AND CLEANING CONDITIONS. STUDIES OF THE BREAKDOWN DURING THE 2000F 1200V TEST SHOWED THAT BREAKDOWN OCCURED OVER THE SURFACE OF THE CERAMIC. SMALL MODIFICATIONS OF THE PRESENT END SEAL CONFIGURATION USING MATERIALS ALREADY ON HAND SHOW PROMISE OF OVERCOMING THIS DIFFICULTY. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-606 139

REPUBLIC AVIATION CORP FARMINGDALE N Y

METALLIC BOSS SEAL EVALUATION AND TEST PROGRAM. (U)

DESCRIPTIVE NOTE: BI-MONTHLY PROGRESS REPT. NO. 5, 1

JAN-1 MAR 61,

MAR 61 1P CANNIZZARO, S. I

REPT. NO. RAC-682-626(268)

CONTRACT: AF33 616 7297

PROJ: U 2 3145

TASK: 61085

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: LEGIBILITY OF THIS DOCUMENT IS IN PART UNSATISFACTORY. REPRODUCTION HAS BEEN MADE FROM BEST AVAILABLE COPY.

DESCRIPTORS: (*METAL SEALS, PERFORMANCE (ENGINEERING)), (*STAINLESS STEEL, METAL SEALS), TITANIUM, ALUMINUM, CARBON, TENSILE PROPERTIES, THERMAL STRESSES, VIBRATION, TESTS (U)

THERMAL CYCLING TESTS USING NAVAN STAINLESS STEEL SEALS IN STAINLESS STEEL ASSEMBLIES SHOWED GOOD PERFORMANCE DURING THE FIRST TWO SERIES OF THERMAL CYCLES; HOWEVER, PERFORMANCE DECREASED IN SUBSEQUENT TESTS APPARENTLY AS A RESULT OF DISASSEMBLY AND REASSEMBLY BETWEEN SERIES. THERMAL CYCLING TESTS USING 1/4-INCH ALUMINUM UNIONS INDICATED THAT THE UNIONS COULD WITHSTAND AN OPERATING PRESSURE OF 2000 PSI AT 400F BUT FAILED AT AN OPERATING PRESSURE OF 4000 PSI. TITANIUM UNIONS ASSEMBLED IN STAINLESS STEEL BOSSES WITH NAVAN STAINLESS STEEL TEES SHOWED SATISFACTORY PERFORMANCE IN THERMAL CYCLING TESTS. REPEATED ASSEMBLY TESTS SHOWED THAT ALTHOUGH THE NAVAN ALUMINUM SEALS WITHSTOOD A HIGHER TIGHTENING TORQUE THAN THE USAF X59C6184 SEALS, THE SEALING ABILITY OF THE LATTER AT LOWER TORQUE VALUES WAS EQUAL TO THAT OF THE NAVAN SEAL. VIBRATION TEST RESULTS ON ASSEMBLIES MADE UP OF COMBINATIONS OF ALUMINUM AND CARBON STEEL AND WITH NAVAN AND X59 ALUMINUM SEALS SHOWED SATISFACTORY PERFORMANCE AT ROOM TEMPERATURE AND AT 400F. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDHL5

AD-610 837

HARRY DIAMOND LABS WASHINGTON D C

SOLDER-GLASS SEALING OF MICROWAVE ANTENNA WINDOWS,

(U)

NOV 64 15P BLOMQUIST, T. V. ;

REPT. NO. TM-64-28

PROJ: DA 1PS23801A300 ,96300

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*WAVEGUIDE WINDOWS, GLASS SEALS), (*GLASS SEALS, WAVEGUIDE WINDOWS), (*METAL SEALS, WAVEGUIDE WINDOWS), STAINLESS STEEL, VACUUM SEALS, THERMAL EXPANSION, MICA

(U)

SIMPLE SOLDER-GLASS TECHNIQUES ARE DESCRIBED FOR VACUUM-TIGHT SEALING OF MICA AND GLASS MICROWAVE WINDOWS IN A METAL FRAME HAVING A COMPATIBLE COEFFICIENT OF THERMAL EXPANSION. THE SEAL IS MADE BY APPLYING 0.020 IN. DIAMETER THREADS OF CORNING NO. 7570 SOLDER GLASS TO HEATED FRAME AND WINDOW. A HAND TORCH AND QUARTZ BOAT PROVED SATISFACTORY FOR HEATING WITH MICA OF THICKNESSES OF 0.003 IN. OR GREATER. A SIMPLE CONE RESISTANCE HEATER WITH VARIAC AND A METAL TABLE PROVIDED MORE PRECISE HEATING FOR SEALING THINNER WINDOWS. THE MATERIALS ARE INEXPENSIVE; THE PROCEDURE AND EQUIPMENT ARE SIMPLE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-635 592 11/6 11/1 13/10.1
NAVY MARINE ENGINEERING LAB ANNAPOLIS MD

GALVANIC CORROSION BEHAVIOR OF WEAR-RESISTANT
MATERIALS FOR MECHANICAL SHAFT SEALS.

(U)

DESCRIPTIVE NOTE: RESEARCH AND DEVELOPMENT PHASE REPT.

JUL 66 15P VREELAND, D. C. I
REPT. NO. MEL-242/66,
PROJ: S-F013-07-01,
TASK: 3723,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*METAL SEALS, *CORROSION),
ELECTROLYSIS, SHAFTS, SUBMARINES, WEAR
RESISTANCE, CORROSION-RESISTANT ALLOYS, COBALT
ALLOYS, CHROMIUM ALLOYS, TUNGSTEN ALLOYS, NICKEL
ALLOYS, MOLYBDENUM ALLOYS, VANADIUM ALLOYS, COPPER
ALLOYS, LEAD ALLOYS, TIN ALLOYS, TITANIUM
COMPOUNDS, CARBIDES, TUNGSTEN COMPOUNDS, SEA
WATER, RINGS, POWDER ALLOYS, SEALS(STOPPERS)

(U)

SHAFT SEALS CURRENTLY USED ON SUBMARINES EMPLOY
MATING WEAR SURFACES WHICH ARE SUPPORTED BY MONEL
CARRIER RINGS. GALVANIC CORROSION EFFECTS BETWEEN
VARIOUS CANDIDATE MATING MATERIALS AND MONEL HAVE
BEEN INVESTIGATED BY THE EXPOSURE OF COUPLES IN
SEAWATER. THE 14 MATERIALS EXPOSED INCLUDED SEVEN
COBALT-CHROMIUM ALLOYS, SIX SINTERED CARBIDE
MATERIALS, AND ONE COPPER-LEAD-TIN ALLOY. THE
RESULTS INDICATE THAT GALVANIC COUPLING TO MONEL
HAD NO ADVERSE EFFECT ON THE CORROSION BEHAVIOR OF
FIVE OF THE COBALT-CHROMIUM ALLOYS, AND ONE OF THE
SINTERED CARBIDE MATERIALS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD636 950 11/2 9/1
EIMAC SAN CARLOS CALIF

METALLURGICAL RESEARCH AND DEVELOPMENT FOR CERAMIC
ELECTRON DEVICES. (U)

DESCRIPTIVE NOTE: REPT. NO. 12 (FINAL) 1 JUL 62-30
JUN 65.

JAN 66 494P REED, L. WADE, W. VOGEL, S. I
MCRAE, R. BARNES, C. I
REPT. NO. TR-66-1, R/E-66-115
CONTRACT: DA-36-039-SC-90903,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-453 367.

DESCRIPTORS: (SEALS, CERAMIC MATERIALS), (METAL
SEALS, ELECTRONIC EQUIPMENT), (MICROWAVE EQUIPMENT,
SEALS), ALUMINUM COMPOUNDS, OXIDES, DIELECTRIC
PROPERTIES, PAINTS, BERYLLIUM COMPOUNDS, QUARTZ,
ELECTRICAL PROPERTIES, RADIOFREQUENCY POWER,
WAVEGUIDE WINDOWS, ELECTRON TUBES (U)
IDENTIFIERS: DEFENDER PROJECT (U)

FIFTEEN SPECIAL 948 AND 998 ALUMINA CERAMICS IN
THE SYSTEM SiO_2 -CAO-AL₂O₃ WITH A
 SiO_2 /CAO RATIO OF 1:1 AND 2:1 WERE
FABRICATED AND THEIR BEHAVIOR CHARACTERIZED. IT
WAS TENTATIVELY ESTABLISHED THAT THE RATE DETERMINING
MECHANISM OF ALUMINA SOLUTION BOTH DURING THE INITIAL
PROCESSING OF THE CERAMIC AND DURING ITS SUBSEQUENT
REACTION DURING METALLIZING WITH REFRACTORY METAL
PAINTS CONTAINING OXIDE ADDITIONS, WAS THE CHEMICAL
REACTION RATE. LUCALOX, SAPPHIRE, BERYLLIA AND
FUSED QUARTZ VACUUM TIGHT SEALS WERE MADE AND THEIR
SEALING MECHANISMS WERE EXAMINED AS WERE THOSE OF
SEVERAL COMMERCIAL ALUMINA CERAMICS. IT WAS
ESTABLISHED THAT CHEMICAL AND/OR SEMICONDUCTING BOND
MECHANISMS WERE RESPONSIBLE FOR THE ACTUAL SEALING
PROCESS OF REFRACTORY METAL TO THE OXIDE SUBSTRATE.
THE ELECTRICAL STUDIES INCLUDED DC RESISTANCE
MEASUREMENTS, LOW POWER RF CONDUCTION AND DIELECTRIC
LOSS STUDIES, AND HIGH POWER LOSS STUDIES. IN
ADDITION TO USAGE ON HIGH POWER KLYSTRONS, THE LOW
LOSS METALLIZING DEVELOPMENT IN THIS STUDY CAN
PROFITABLY BE USED ON PLANAR TRIODES AND REFLEX
KLYSTRONS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMLS

AD#718 180 13/9 11/8
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

DEVICE FOR LUBRICATING BEARINGS, (U)

DEC 70 7P PANFILOV, E. A. ILUBENETS,
V. D. IROMANENKO, N. T. INIKITIN, YU F. I
TERKEL, A. L. I
REPT. NO. FTD-HT-23-785-70
PROJ: FTD-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF PATENT (USSR) 241
841 2P, 1969, BY D. KOOLBECK.

DESCRIPTORS: (*ANTIFRICTION BEARINGS,
*LUBRICATION), SCREW THREADS, DRIVE SHAFTS, (U)
METAL SEALS, PATENTS, USSR (U)
IDENTIFIERS: TRANSLATIONS (U)

THE DEVICE FOR LUBRICATING BEARINGS, E.G., GAS-
BLAST, BY SURROUNDING THE SHAFT WITH OPPOSITELY
DIRECTED THREADS WHICH SUPPLY OIL TO THE BEARINGS IS
DISTINGUISHED BY THE FACT THAT IN ORDER TO PROVIDE
LUBRICANT TO THE LOW-SPEED SHAFT WITHOUT INCREASING
THE DIMENSIONS AND WEIGHT OF THE PART, A SEALING RING
IS PLACED ON THE HIGH-SPEED SHAFT. THIS SEALING RING
LIMITS THE SUPPLY OF OIL TO ONE OF THE BEARINGS BY
FORMING A FORCING CHAMBER DURING ROTATION TOGETHER
WITH THE THREADS AND THE HOUSING OF THE BEARINGS.
THE FORCING CHAMBER IS CONNECTED BY A CHANNEL WITH
A CAVITY LOCATED BETWEEN THE THREADS OF THE LOW-SPEED
SHAFT. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-721 032 11/8
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

LUBRICATING COMPOSITION FOR MERCURY WATER
SEALS.

(U)

DEC 70 8P KULIEV, A. M.; ISULEIMANOVA,
F. G. ILOVICH, I. I. ILEVSHINA, A. M. ;
VEDENEEVA, L. YA. ;
REPT. NO. FTD-NT-23-743-70
PROJ: FTD-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF PRISADKI K
SMAZOCHNYM MASLAN (USSR) N2 P128-130 1969. BY D.
KOOLBECK.

DESCRIPTORS: (SEALS, LUBRICANTS), MERCURY,
WATER, LUBRICANT ADDITIVES, POLYMERS, TEST
METHODS, USSR

(U)

IDENTIFIERS: THICKENERS (MATERIALS),
TRANSLATIONS

(U)

THE MAXIMUM OPERATING CAPABILITIES OF MINERAL
FLUIDS USED IN MERCURY WATER SEALS ARE CHARACTERIZED
BY THE AVERAGE MAGNITUDE OF CRITICAL VELOCITY; THE
LATTER IS DETERMINED BY THE POTENTIAL PHYSICOCHEMICAL
PROPERTIES OF THE MINERAL CRUDE. THE AUTHORS
PREPARED LUBRICATING COMPOSITIONS BASED ON A LOW-
VISCOSITY OIL FRACTION BY THICKENING IT WITH THE
COPOLYMER OF ISOBUTYLENE WITH STYRENE OR WITH
POLYISOBUTYLENE (IN CONCENTRATIONS OF 0.9 TO
3.0%). THE PROPOSED COMPOSITIONS WERE SUBJECTED
TO PRELIMINARY TESTING ON A LABORATORY MERCURY SEAL.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-730 361 11/1 21/5
CURTISS-WRIGHT CORP WOOD-RIDGE N J

STATIC AND ROTATING AIR/GAS SEAL
EVALUATION.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 71 17UP PALADINI, W. ;
REPT. NO. CW-WR-70-024F
CONTRACT: DAAJD2-70-C-0024
PROJ: DA-IG-162204-A-014
TASK: IG-162204-A-01409
MONITOR: USAAMPDL TR-71-28

UNCLASSIFIED REPORT

DESCRIPTORS: (GAS SEALS, LEAKAGE (FLUID)),
(GAS TURBINES, GAS SEALS), ROTARY SEALS, C-
RINGS, METAL SEALS, CENTRIFUGAL COMPRESSORS,
AXIAL-FLOW COMPRESSORS, COMPRESSOR PARTS,
MECHANICAL DRAWINGS
IDENTIFIERS: LABYRINTH SEALS

(U)

(U)

THE REPORT DESCRIBES AN EVALUATION OF THE LEAKAGE CHARACTERISTICS OF CURRENT GAS TURBINE ENGINE AIR/GAS SEALS AND SEALING SURFACES OF SMALL GAS TURBINE ENGINES. THE EVALUATION INCLUDED DEFINITION OF PROBABLE AIR/GAS LEAKAGE SOURCES AND PATHS IN AN ENGINE POSSESSING VARIABLE COMPRESSOR AND POWER TURBINE STATOR GEOMETRY, IDENTIFICATION OF SEALING CONCEPTS CURRENTLY IN USE, PREDICTION OF SEAL LEAKAGE IN THE SMALL ENGINE, RIG TESTING OF SEVERAL STATIC AND ROTATING SEALS, AND ANALYSIS OF THE EFFECT OF LEAKAGE ON SMALL ENGINE PERFORMANCE. THE ROTATING SHAFT SEAL TESTS WERE CONDUCTED ON A FIN-TO-FIN LABYRINTH SEAL AND A CARBON FACE CONTACT SEAL. THE CASING FLANGE SEAL TESTS WERE CONDUCTED ON METAL-TO-METAL SURFACES AND ON FOUR METAL SEALS FOR FLANGES. THE VARIABLE-GEOMETRY VANE TRUNNION SEAL TESTS WERE CONDUCTED ON A FLUOROCARBON BUSHING AND A METAL BUSHING FOR THE COMPRESSOR AND POWER TURBINE LOCATIONS, RESPECTIVELY. TESTING INCLUDED LEAKAGE CALIBRATIONS, AND THERMAL CYCLIC AND MECHANICAL CYCLIC OPERATION. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDML5

AD-734 232 13/11
ROCKETDYNE CANOGA PARK CALIF

CONTAMINANT PARTICLES IN METAL-TO-METAL
CLOSURES.

(U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 70-JUN 71,
DEC 71 195P TELLIER, G. F. ISPRING, T.
R. 1

REPT. NO. R-8782
CONTRACT: FD4611-70-C-0048
MONITOR: AFRPL TR-71-112

UNCLASSIFIED REPORT

DESCRIPTORS: (•VALVES, •METAL SEALS),
CONTAMINATION, LEAKAGE(FLUID), DESIGN,
COPPER, IMPACT TESTS, LIFE EXPECTANCY

(U)

THE REPORT CONTAINS THE RESULTS OF ANALYTICAL AND
EXPERIMENTAL INVESTIGATIONS TO DEVELOP METAL-TO-METAL
CONTAMINANT-RESISTANT CLOSURES. INVESTIGATIONS WERE
COMPRISED OF STATIC AND DYNAMIC HIT FREQUENCY AND
LIFE CYCLE TESTS OF HARD-ON-HARD (440C) AND HARD-
ON-SOFT (COPPER) CLOSURES WITH 1/2-INCH NOMINAL
OD. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENLS

AD-288 540

OKLAHOMA STATE UNIV STILLWATER SCHOOL OF MECHANICAL
ENGINEERING

A CONTINUATION OF THE STUDY IN THE FIELD OF FLUID
SEALS FOR HIGH-SPEED ROTATING EQUIPMENT (U)

AUG 61 IV CHAPEL, R.E. MORROW, R.B. BELSH, F.M.I
CONTRACT: AF34 601 5470

UNCLASSIFIED REPORT

DESCRIPTORS: OIL SEALS; AIRCRAFT EQUIPMENT; FLUIDS;
FUEL SEALS; HYDRAULIC FLUIDS; HYDRAULIC SEALS; HYDRAULIC
SYSTEMS; METAL SEALS; PRESSURE; ROTARY SEALS; ROTATING
STRUCTURES; SEALS (STOPPERS); SHAFTS; SURFACES; TEST
FACILITIES (U)

IDENTIFIERS: B-58 AIRCRAFT (U)

FROM A CONTINUED SURVEILLANCE OF TECHNICAL
LITERATURE, VENDOR INFORMATION AND ANALYSIS OF
VARIOUS FLUID SEAL PROBLEMS, THE FLUID SEAL PROBLEM
IN GENERAL SEEMS TO BE REACHING A POINT OF STATUS
QUO. RESEARCH IS BEING CONTINUED ON SEAL
APPLICATIONS INVOLVING SUPER PARAMETER REQUIREMENTS,
ROTATING SPEED, PRESSURE, TEMPERATURE, AND SPECIAL
FLUIDS, BUT THE APPLICATIONS FOR THE MAJORITY OF
AIRCRAFT ACCESSORY SITUATIONS SEEMS TO BE FAIRLY WELL
SOLVED. SPEEDS OF 25,000 TO 40,000 RMP, PRESSURES
AS HIGH AS 300 PSI, AND CONVENTIONAL FLUIDS, SUCH AS
HYDRAULIC FLUID, JET ENGINE FUEL, SEEM TO OFFER
LITTLE PROBLEM IN SEALING WITH PRESENT DAY SEAL
DESIGNS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEMLS

AD-410 925

GENERAL ELECTRIC CO SCHENECTADY N Y

THEORETICAL INVESTIGATION OF OIL BACKSTREAMING
THROUGH A VACUUM TRAP, (U)

JUL 63 58P

TSONIS ,C. HOLKEBOER ,D.

H. JONES, O. W. J

CONTRACT: AF 40(600)-954

PN0J: AF-7778

TASK: 777801

MONITOR: AEDC YDR-63-149

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: IN COOPERATION WITH AERO VAC
CORP., TROY, N. Y.

DESCRIPTORS: (•DIFFUSION PUMPS, OILS), (•FLUID
FLOW, THEORY), (•OIL SEALS, DESIGN), VACUUM
SEALS, VACUUM APPARATUS, GEOMETRY, CONDEN
SATION, MOLECULES, DIFFUSION, PRESSURE,
OPERATION, CONTAMINATION, ANALYSIS. (U)

IDENTIFIERS: 1963, BACKSTREAMING, ELBOW TRAP. (U)

THE PHENOMENA OF OIL BACKSTREAMING THROUGH AN
OPTICALLY TIGHT, LIQUID NITROGEN-COOLED 36-IN.
DIAMETER ELBOW TRAP IS ANALYZED. TRAP GEOMETRY IS
STUDIED IN CONJUNCTION WITH THE EFFECTS OF CON
DENSATION COEFFICIENT, MOLECULAR COLLISION, DIF
FUSION, AND GAS SWEEPING EFFECTS. FOUR MODES OF
OIL ESCAPE ARE CONSIDERED FOR OPERATING PRESSURES
RANGING FROM THE MOLECULAR TO THE CONTINUUM FLOW
REGION: (1) OIL TRANSFER BY SINGLE BOUNCE,
(2) OIL TRANSFER BY OIL-TO-OIL COLLISION, (3)
OIL TRANSFER BY OIL-TO-AIR COLLISION, AND (4) OIL
TRANSFER BY DIFFUSION AND SWEEPING ACTION.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENLS

AD-424 301

NARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

PROPOSED MILITARY SPECIFICATION GASKETS, HATCH SEAL
O-RING, OIL-RESISTANT RUBBER. (U)

7B

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•GASKETS, MILITARY REQUIREMENTS), (•SEALS
(STOPPERS), SUBMARINES), SPECIFICATIONS, HATCHES,
RUBBER, MECHANICAL PROPERTIES, TESTS, ENVIRONMENTAL
TESTS, TEST METHODS (U)
IDENTIFIERS: 1963, O-RING SEALS (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEMLS

AD-607 240

MONSANTO RESEARCH CORP DAYTON OHIO

EVALUATION OF ELASTOMERS AS O-RING SEALS FOR LIQUID
ROCKET FUEL AND OXIDIZER SYSTEMS. (U)

DESCRIPTIVE NOTE: REPT. FOR MAR 63-MAR 64,
AUG 64 102P BELLANCA, CARMEN L. ISALYER,
IVAL O. HARRIS, JAY C. I
CONTRACT: AF33 616 8483
PROJ: 7381
TASK: 738103
MONITOR: ASD, TDR63 496 P2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (FUEL SEALS, LIQUID ROCKET FUELS),
(ELASTOMERS, O-RINGS), (O-RINGS, FUEL SEALS),
POLYETHYLENE PLASTICS, HALOCARBON PLASTICS, BUTYL
RUBBER, SILICONES, PLASTICS, CLADDING, ENCAPSULATION,
METAL COATINGS, LIQUID ROCKET OXIDIZERS, DEGRADATION,
TEST METHODS, ROCKET PROPELLANTS, OXIDATION, PERFORMANCE
(ENGINEERING), FUEL SYSTEMS, NITROGEN COMPOUNDS, OXIDES,
HYDRAZINE, HYDROGEN PEROXIDE, CHLORINE TRIFLUORIDE (U)

O-RING SEALS OF SELECTED ELASTOMERIC AND COMPLIANT
MATERIALS WERE EVALUATED FOR RESISTANCE TO LIQUID
ROCKET FUELS IN A SIMULATED END-USE TEST. THE
CANDIDATE ELASTOMERS WERE PLACED UNDER COMPRESSION IN
CLOSED CELLS AND EXPOSED TO THE LIQUID AND VAPOR OF
LIQUID ROCKET FUELS AND OXIDIZERS FOR EXTENDED
PERIODS OF TIME. RATE OF FUEL LOSS THROUGH THE
SEAL, AND THE CHANGE IN PHYSICAL PROPERTIES OF THE
SEAL MATERIALS WERE DETERMINED. NITROGEN
TETROXIDE, MIXED HYDRAZINES, CHLORINE TRIFLUORIDE,
90% HYDROGEN PEROXIDE, HYBALINE A-B, AND
PENTABORANE WERE TESTED IN DIRECT CONTACT WITH THE
O-RING SEALS AT 73F. METAL CLAD AND
POLYETHYLENE ENCAPSULATED ELASTOMERIC O-RINGS WERE
ALSO TESTED FOR RESISTANCE TO NITROGEN TETROXIDE AT
73F. THE EFFECT OF TEMPERATURE ON ELASTOMER
ENDURANCE WAS DETERMINED BY EXPOSING THE O-RINGS TO
NITROGEN TETROXIDE, MIXED HYDRAZINES, AND HYDROGEN
PEROXIDE AT 180F. THE EFFECT OF DIRECT IMMERSION
IN LIQUID ROCKET FUEL ON THE PHYSICAL PROPERTIES OF
THE SEAL MATERIALS WAS INVESTIGATED BY IMMERSING
PROMISING O-RING CANDIDATES IN NITROGEN TETROXIDE,
HYDROGEN PEROXIDE, AND MIXED HYDRAZINE. (AUTHOR)

(U)

96

UNCLASSIFIED

/ZEMLS

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENL5

AD-612 604

GENERAL DYNAMICS/FORT WORTH TEX

THE EFFECTS OF REACTOR RADIATION ON THE PHYSICAL
PROPERTIES OF TWO RADIATION-RESISTANT O-RING
COMPOUNDS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. FOR 1 OCT 63-30 SEP 64,
JAN 65 82P LEWIS, J. M. JOHNSON, P. M. I

SELF, M. R. I

REPT. NO. FZK-196

CONTRACT: AF29 601 6213

PROJ: AF-6773

TASK: 677302

MONITOR: AFWL TR-64-133

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: O-RINGS, RADIATION DAMAGE, ELASTOMERS,
RADIATION DAMAGE, RADIATION DAMAGE, O-RINGS, STYRENE
PLASTICS, ACRYLONITRILE POLYMERS, TENSILE PROPERTIES,
HARDNESS, COMPRESSIVE PROPERTIES, WEIGHT, DENSITY,
DEFORMATION

(U)

IDENTIFIERS: BUTADIENES

(U)

TWO O-RING COMPOUNDS SPECIALLY FORMULATED FOR
RADIATION RESISTANCE - PRPC 1387 AND PRPC 4387
(ACRYLONITRILE-BUTADIENE) (STYRENE-
BUTADIENE) - WERE IRRADIATED TO SIX GAMMA DOSE
LEVELS IN THE RANGE OF FROM 4.9×10 TO THE 8TH POWER
TO 1.5×10 TO THE 11TH POWER ERGS/GM(C). O-RINGS,
TENSILE SPECIMENS, AND COMPRESSION-SET BUTTONS OF
BOTH MATERIALS WERE IRRADIATED IN AIR AT (OR
NEAR) ROOM TEMPERATURE. O-RINGS OF PRPC 1387
WERE ALSO IRRADIATED IN OIL. TENSILE PROPERTIES,
HARDNESS, COMPRESSION SET, WEIGHT CHANGE, AND
SPECIFIC GRAVITY WERE MEASURED AS A FUNCTION OF
RADIATION DOSE. SEVERAL ANALYTICAL PROCEDURES WERE
USED IN INTERPRETING THE DATA. THE WIDE RANGE OF
DOSES EMPLOYED IN THE EXPERIMENT PROVIDES AN ACCURATE
ASSESSMENT OF DEGRADATION PRODUCED BY RADIATION.
THE HIGHEST DOSE RESULTED IN COMPLETE LOSS OF
USEFUL MECHANICAL PROPERTIES. THE PROPERTIES MOST
ADVERSELY AFFECTED AT LOWER DOSES WERE ULTIMATE
ELONGATION, HARDNESS, AND COMPRESSION SET.
HOWEVER, BOTH MATERIALS EXHIBIT GOOD RADIATION
RESISTANCE AND APPEAR TO BE USEFUL UP TO DOSES OF AT
LEAST 10 TO THE 10 TH POWER ERGS/GM(C). (AUTHOR)

(U)

UNCLASSIFIED

/ZENL5

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEMLS

AD-657 917 11/1
OREGON STATE UNIV CORVALLIS DEPT OF CHEMISTRY

A SIMPLE VACUUM SEAL FOR NON-CIRCULAR TUBES, (U)

JAN 67 3P FREDERICKS, W. J. I
CONTRACT: AF-AFOSR-217-66
PROJ: AF-9761
TASK: 976102
MONITOR: AFOSR 67-2075

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN J. SCI INSTRUM V44
P561 1967.

DESCRIPTORS: (O-RINGS, PIPES), DESIGN, VACUUM
SEALS, DEFORMATION, VACUUM FURNACES (U)

A SIMPLE O-RING SEAL FOR LARGE DIAMETER NON-
CIRCULAR TUBES IS DESCRIBED. THE O-RING IS
FORCED TO CONFORM TO THE CONTOUR OF THE TUBE BY A
DEFORMABLE BACKING RING AND SEALED BY A HAND NUT.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENL5

AD-665 374 11/10 21/7 11/1
ARMY COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND
MD

INVESTIGATING FUEL-ALCOHOL EFFECTS ON ELASTOMER
COMPONENTS OF DIESEL INJECTOR SYSTEMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JAN 68 27P LEPERA, W. E. JOGEL, C.

A. ?
REPT. NO. CCL-244
PROJ: DA-16024401A106

UNCLASSIFIED REPORT

DESCRIPTORS: (FUEL INJECTORS, O-RINGS),
(ELASTOMERS, COMPATIBILITY), DIESEL ENGINES,
FREEZING POINT DEPRESSANTS, ALCOHOLS, PETROLEUM,
DEFORMATION, STRESSES (U)

AN INVESTIGATION WAS CONDUCTED TO DEFINE POSSIBLE
DELETERIOUS EFFECTS ON INJECTOR SYSTEM 'O-RING'
COMPONENTS RESULTING FROM ADDITIONS OF FREEZE-POINT
DEPRESSANTS TO DIESEL FUEL. AN ACCELERATED TEST
METHOD WAS SUBSEQUENTLY DEVELOPED TO DETERMINE THE
COMPATIBILITY OF FUEL-ALCOHOL MIXTURES WITH A VARIETY
OF MOLDED 'O-RING' COMPONENTS CURRENTLY IN USE BY
EQUIPMENT MANUFACTURERS. IT WAS FOUND THAT AS LOW
AS THREE PERCENT ADDITIONS OF ETHANOL TO DIESEL FUEL
RESULTED IN SIGNIFICANT LOSSES IN ELASTOMER
PROPERTIES. IN ADDITION, THE INCORPORATING OF A
STRESS MODE OF EXPOSURE ENHANCED THE DEGRADATORY
EFFECTS OF ALCOHOL-FUEL MIXTURES ON THE TEST 'O-RING'
COMPONENTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEHL5

AD-686 175 13/9 11/1
TENNESSEE UNIV KNOXVILLE DEPT OF MECHANICAL AND AEROSPACE
ENGINEERING

AN EXPERIMENTAL STUDY OF THE VISCOSEAL
BEARING.

(U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
FEB 69 77P SHAH, CHANDRAKANT KHUMAJI ;
REPT. NO. ME69-T57-2
CONTRACT: NDU014-68-A-0144, NGR-43-001-003

UNCLASSIFIED REPORT

DESCRIPTORS: (*BEARINGS, FLUID FLOW), (*OIL
SEALS, FLUID FLOW), LUBRICATION, OILS,
VISCOSITY, EXPERIMENTAL DESIGN,
LOADING(MECHANICS), NUMERICAL ANALYSIS, FILMS,
FRICTION, TORQUE, THERMAL EXPANSION, FLOWMETERS,
CALIBRATION

(U)

IDENTIFIERS: *VISCOSEAL BEARINGS

(U)

THE EXPERIMENTAL DATA OBTAINED FROM TWO GROOVE
GEOMETRIES OF THE VISCOSEAL BEARING WERE ANALYSED TO
STUDY THE BEARING CHARACTERISTICS AND THE SEALING
PERFORMANCE. THE EXPERIMENTAL BEARING
CHARACTERISTICS WERE COMPARED WITH THE DUBOIS AND
OCVIRK SHORT-BEARING APPROXIMATION. THE
SEALING PERFORMANCE ANALYSIS OF THE BEARING INCLUDED
(1) THE DETERMINATION OF THE SEALING COEFFICIENT
WHICH WAS COMPARED WITH THE STAIR AND HALE METHOD
OF THEORETICAL PREDICTION AND (2) THE EFFECT OF
THE BEARING ECCENTRICITY RATIO ON THE SEALING
COEFFICIENT, WHICH WAS COMPARED WITH THE VOHN AND
CHOW METHOD OF THEORETICAL PREDICTION. THE
RESULTS OF THE STUDY INDICATED THAT, AT CONSTANT LOAD
AND SPEED, THE BEARING SUPPLY PRESSURE HAD NO EFFECT
ON THE BEARING ECCENTRICITY RATIO; AT A CONSTANT FLOW
RATE, HOWEVER, THE BEARING SUPPLY PRESSURE DECREASED
AS THE BEARING ECCENTRICITY RATIO INCREASED.
EXCEPT FOR THE SHAFT CENTER LOCUS FINDINGS, THE
EXPERIMENTAL RESULTS WERE IN FAIR AGREEMENT WITH THE
SHORT-BEARING APPROXIMATION. THE EXPERIMENTAL
RESULTS SHOWED GOOD AGREEMENT WITH A NUMERICAL
ANALYSIS OF THE VISCOSEAL BEARING. THE STUDY ALSO
INDICATED THAT AN INCREASE IN THE LAND WIDTH RESULTED
IN AN INCREASE IN THE LOAD-CARRYING CAPACITY OF THE
BEARING. THE EXPERIMENTAL SEALING COEFFICIENT DID
NOT AGREE WITH THE THEORETICAL PREDICTION, ALTHOUGH
THE RESULTS INDICATED THAT THE SEALING COEFFICIENT
INCREASED WITH AN INCREASE IN THE BEARING.

(U)

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/ZEHL5

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENL5

AU-693 195 11/1 20/11
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS
RESEARCH LAB

THE THEORY OF PLANE ELASTIC DEFORMATION APPLIED TO
THE COMPRESSION OF RUBBER SEALS, (U)

AUG 69 34P EHLERS, F. EDWARD I
REPT. NO. MATHEMATICAL NOTE-613, D1-82-0883
HUNTOR: IDEP 345.50.70.00-C6-01

UNCLASSIFIED REPORT

DESCRIPTORS: (O-RINGS, COMPRESSIVE PROPERTIES),
RUBBER SEALS, ELASTICITY, DEFORMATION, FRICTION,
LUBRICATION, STRESSES, DISKS, PRESSURE,
THEORY, FUNCTIONS, ITERATIVE METHODS, FOURIER
ANALYSIS, BOUNDARY VALUE PROBLEMS (U)
IDENTIFIERS: PLANE ELASTIC DEFORMATION, LUBRICATED
O-RINGS (U)

THE THEORY OF PLANE ELASTIC DEFORMATION AS
DEVELOPED BY MILNE-THOMSON UTILIZING COMPLEX
VARIABLES IS EXPLAINED IN DETAIL. FORMULAS FOR THE
DISPLACEMENTS AND THE NORMAL AND SHEAR STRESS IN A
CIRCULAR DISC ARE PRESENTED IN TERMS OF ANALYTIC
FUNCTIONS OF A COMPLEX VARIABLE. BY MEANS OF THESE
FORMULAS, AN ITERATION PROCEDURE FOR FINDING THE
PRESSURE DISTRIBUTION ON A LUBRICATED O RING IN A
RECTANGULAR CHANNEL IS DEVELOPED. SINCE THE
GENERAL FORM OF THE PRESSURE DISTRIBUTION ON THE RING
IS KNOWN, THE PRESSURE DISTRIBUTION IS FIRST
ESTIMATED. BY MEANS OF FOURIER ANALYSIS, THE
COEFFICIENTS FOR THE PRESSURE ON THE BOUNDARY ARE
FOUND; AND FROM THESE COEFFICIENTS, THE EXPANSIONS
FOR THE DISPLACEMENTS ON THE BOUNDARY ARE CALCULATED.
THE FIRST ESTIMATE OF THE BOUNDARY PRESSURE IS THEN
MODIFIED TO IMPROVE THE DISPLACEMENTS UNTIL THE RING
FITS INTO THE RECTANGULAR CHANNEL. FORMULAS ARE
DERIVED FOR THE APPROPRIATE COEFFICIENTS IN THE
EXPANSION. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENL6

AD-710 350 13/10 13/13
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

STRUCTURAL DESIGN OF CONICAL ACRYLIC
VIEWPORTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 67-APR 69.
JUN 70 67P SNOET, M. R. (KATONA, M.

G. I

REPT. NO. NCEL-TR-686
PROJ: YFJB-535.009.01.005

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER VEHICLES, VISIBILITY),
(STRUCTURAL PARTS, DESIGN), ACRYLIC RESINS,
OPERATION, CONICAL BODIES, FAILURE (MECHANICS),
SEALS, STRUCTURAL PROPERTIES, THICKNESS,
EXPOSURE, VISCOELASTICITY, PRESSURE,
LOADING (MECHANICS), HYDROSTATIC PRESSURE, O-
RINGS, SHEAR STRESSES (U)
IDENTIFIERS: VIEWPORTS, MANNED SUBMERSIBLES (U)

THE PURPOSE OF THIS REPORT IS TO ESTABLISH A
RATIONAL ENGINEERING APPROACH FOR THE DESIGN OF
CONICAL ACRYLIC VIEWPORTS. TO ACHIEVE THIS GOAL, A
TIME-DEPENDENT, YIELD-FAILURE CRITERION WAS DEVELOPED
AND UTILIZED IN THE ANALYSIS OF A VARIETY OF VIEWPORT
CONFIGURATIONS. SPECIFICALLY, A RANGE OF THICKNESS/
MINOR DIAMETER (T/D) RATIOS FROM 0.25 TO 1.75 AND
INCLUDED ANGLES FROM 60 DEGREES TO 120 DEGREES WERE
ANALYZED BY THE FINITE ELEMENT TECHNIQUE. USING THE
VIEWPORT STRUCTURAL ANALYSIS IN CONJUNCTION WITH THE
YIELD-FAILURE CRITERION FOR ACRYLIC, TIME-DEPENDENT
OPERATING DEPTHS WERE DETERMINED AS A FUNCTION OF
VIEWPORT CONFIGURATION. PARALLELING THE ABOVE, AN
EXPERIMENTAL INVESTIGATION WAS PERFORMED TO VALIDATE
THE ANALYTICAL RESULTS. SIX FULL-SCALE VIEWPORTS
WERE TESTED FOR A YEAR UNDER SIMULATED OPERATIONAL
CONDITIONS THAT INCLUDED SIMULTANEOUS CYCLING OF
PRESSURE AND TEMPERATURE, 0 TO 4,000 PSI AND 70 TO
35F, RESPECTIVELY. COMPARISON OF ANALYTICAL AND
EXPERIMENTAL RESULTS INDICATED EXCELLENT AGREEMENT
FOR THE PHYSICAL LOCATION OF VIEWPORT FAILURE AT
SPECIFIED LOADING HISTORIES. DESIGN RECOMMENDATIONS
ARE PRESENTED IN THE FORM OF DESIGN CURVES WHICH
ENABLE THE DESIGN OF A CONICAL ACRYLIC VIEWPORT FOR A
SPECIFIED OPERATING PRESSURE AND DURATION UNDER LOAD.
TO COMPLETE THE RECOMMENDATIONS, DESIGN INFORMATION
IS GIVEN ALSO ON SEALING WITH A CONVENTIONAL O-
RING, AS WELL AS GUIDELINES FOR ELEVATING A VIEWPORT. (U)

102
UNCLASSIFIED

/ZENL6

UNCLASSIFIED

DDI REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEMLS

AD-723 679 13/9 1/3
AVIATION ELECTRIC LTD MONTREAL (QUEBEC)

CLOSURE TECHNIQUE FOR LARGE BEARINGS ON
AIRCRAFT WHEELS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. AUG 67-JUN 69.

MAR 71 59P
REPT. NO. AETR-13857
CONTRACT: F33657-67-C-1527
PROJ: WL-7-1630-1147
MONITOR: ASD TR-70-52

UNCLASSIFIED REPORT

DESCRIPTORS: (•ROLLER BEARINGS, •OIL SEALS),
(•JET FIGHTERS, LANDING GEAR), LUBRICANTS,
LEAKAGE (FLUID), ROLLER BEARINGS, RINGS, TEST
METHODS, LIFE EXPECTANCY, SPARE PARTS
IDENTIFIERS: F-4 AIRCRAFT, F-4C AIRCRAFT,
GREASE SEALS

(U)

(U)

AIRCRAFT WHEELS INCORPORATING LARGE BEARINGS (10
INCHES DIAMETER AND LARGER) HAVE BEEN SUBJECT TO
PROBLEMS RELATING TO GREASE RETENTION. THE PROJECT
INCLUDED INSPECTING A NUMBER OF F-4C AIRCRAFT
WHEELS DURING OVERHAUL AT MACDILL AIR FORCE
BASE. TESTS OF VARIOUS DESIGNS OF SEALS WERE
THEN CONDUCTED AT AVIATION ELECTRIC LIMITED TO
DETERMINE IF A SATISFACTORY METHOD OF SEALING SUCH
BEARINGS COULD BE DEVELOPED. AS A RESULT OF THE
INVESTIGATION, IT WAS CONCLUDED THAT THE FAILURE OF
F-4C WHEEL BEARINGS WAS DUE TO LOSS OF GREASE.
TESTS INDICATED THAT SEVERAL ORDERS OF MAGNITUDE
IMPROVEMENT IN BEARING SEALS COULD BE REALIZED.
ONE DESIGN IS DIRECTLY INTERCHANGEABLE WITH
EXISTING SEALS AND TWO DESIGNS REQUIRE SOME WHEEL
MODIFICATION; HOWEVER, THESE DESIGNS COULD BE
INCORPORATED IN NEW WHEELS WITH VERY LITTLE
DIFFICULTY. (AUTHOR)

(U)

UNCLASSIFIED

JDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEMLS

NO-728 216 13/1 1/3
BENDIA CORP SOUTH BEND IND ENERGY CONTROLS DIV

COMPONENT IMPROVEMENT PROGRAM FOR AIRCRAFT
BRAKE PISTON SEALS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. DEC 69-MAY 71,
AUG 71 38P HORNER, RICHARD F. I
CONTRACT: F33657-70-C-0508
PROJ: WM-9-163-2605
MONITOR: ASD TR-71-43

UNCLASSIFIED REPORT

DESCRIPTORS: (PISTONS, O-RINGS), (O-RINGS,
LEAKAGE (FLUID)), (LANDING GEAR, HYDRAULIC
BRAKES), MATERIALS, HYDRAULIC SEALS, HYDRAULIC
FLUIDS, OPTIMIZATION, ELASTOMERS, CONFIGURATION,
THERMAL STABILITY, COLD WEATHER TESTS

(U)

HYDRAULIC FLUID LEAKAGE IN AIRCRAFT BRAKES HAS LONG
BEEN A PROBLEM FOR THE AIR FORCE. THIS LEAKAGE
COMMONLY OCCURS WHEN THE EQUIPMENT IS OPERATED IN A
LOW TEMPERATURE ENVIRONMENT. IN SOME CASES, THE
LEAKAGE PROBLEM WAS RESOLVED BY USING SPECIAL
NONSTANDARD 'O' RING SEALS AT A HIGHER COST.
CONSEQUENTLY, IT IS DESIRABLE TO DETERMINE IF A
REVISION TO THE STANDARD GLAND DIMENSIONS WILL
IMPROVE COLD TEMPERATURE PERFORMANCE OF MS-28775
SERIES 'O' RING SEALS. THE PRIMARY PURPOSE OF
THIS INVESTIGATION WAS TO DETERMINE OPTIMUM GLAND
DIMENSIONS FOR USE WITH EXISTING MS-28775 'O'
RING PACKINGS FOR AIRCRAFT BRAKE DYNAMIC SEALS. A
SECONDARY OBJECTIVE WAS TO EVALUATE NEW MATERIALS FOR
SEALS. (AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENL

AD-729 320 13/9 11/1 1/3
PHATT AND WHITNEY AIRCRAFT WEST PALM BEACH FLA FLORIDA
RESEARCH AND DEVELOPMENT CENTER

BEARING AND SEAL TECHNOLOGY REVIEW.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

JUN 71 127P NIEGEL, ANTHONY F. :

REPT. NO. PWA-FR-4189

CONTRACT: DAAJ02-68-C-0001

PROJ: DA-1-G-163201-D-447

TASK: 1-G-163201-D-44701

MONITOR: USAAMNDL TH-71-26

UNCLASSIFIED REPORT

DESCRIPTORS: (•BEARINGS, TURBOJET ENGINES),
(•OIL SEALS, SHAFTS), REVIEWS, MECHANICS,
ENGINE STRUCTURES, LUBRICATION, COOLING, BALL
BEARINGS, ROLLER BEARINGS, COMPRESSORS, DESIGN,
SCALE, GAS FLOW, EXPERIMENTAL DATA

(U)

IDENTIFIERS: •ENGINE SHAFT BEARING AND SEAL
TECHNOLOGY

(U)

PHATT AND WHITNEY AIRCRAFT LARGE AND SMALL
ENGINE MAIN SHAFT BEARINGS AND SEALS WERE REVIEWED
(1) TO IDENTIFY LARGE GAS TURBINE ENGINE BEARING
AND SEAL CONCEPTS OR CHARACTERISTICS WHICH ARE
APPLICABLE TO SMALL GAS TURBINE ENGINES OF THE 2-10
LB/SEC AIRFLOW SIZE, (2) TO DEFINE LARGE ENGINE
BEARING AND SEAL DESIGN STANDARDS FOR APPLICABILITY
TO SMALL GAS TURBINE ENGINES, (3) TO DETERMINE
SUITABLE FACTORS FOR SCALING BEARING AND SEAL
TECHNOLOGY CONCEPTS FROM LARGE GAS TURBINE ENGINES TO
SMALL, 2-10 LB/SEC AIRFLOW SIZE TURBINE ENGINES,
(4) TO RECOMMEND TEST PROGRAMS TO PROVIDE SCALING
DATA WHERE SCALE FACTORS ARE QUESTIONABLE, AND
(5) TO DETERMINE WHAT BEARING AND SEAL TECHNOLOGY
IS LACKING FOR ADVANCED SMALL ENGINES. TO
ACCOMPLISH THIS TASK, BEARING AND SEAL
CHARACTERISTICS THAT MIGHT DEFINE STANDARD DESIGN
PRACTICES OR SCALE FACTORS WERE SELECTED. AFTER
COLLECTION AND COMPILATION OF PERTINENT DATA,
COMPARISONS WERE MADE TO ESTABLISH RELATIONSHIPS
BETWEEN ENGINE SIZE AND SELECTED BEARING AND SEAL
CHARACTERISTICS. IN ADDITION, COMPARISONS OF
SELECTED CHARACTERISTICS OF LARGE, MOSTLY TWIN-SPOOL
ENGINES VERSUS SMALL ENGINE BEARING, SEAL, AND ROTOR
DYNAMIC CHARACTERISTICS WERE MADE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEML5

AD-729 329 11/1 13/9 21/5
GENERAL ELECTRIC CO WEST LYNN MASS AIRCRAFT ENGINE
GROUP

BEARING AND SEAL SCALABILITY STUDY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 71 55P ZIRIN, LOUIS I. ;
CONTRACT: DAAJ02-68-C-0002
PROJ: DA-1-G-163201-D-447
TASK: 1-G-163201-D-44701
MONITOR: USAAMRDL TR-71-27

UNCLASSIFIED REPORT

DESCRIPTORS: (*ANTIFRICTION BEARINGS, *OIL SEALS),
(*TURBOJET ENGINES, ANTIFRICTION BEARINGS), GAS
TURBINES, TURBINE PARTS, GAS BEARINGS, BALL
BEARINGS, PERFORMANCE (ENGINEERING), DESIGN,
STATISTICAL DATA

(U)

IDENTIFIERS: TURBOSHAFT ENGINES, SCALING LAWS,
LABYRINTH SEALS

(U)

DURING THIS ANALYTICAL STUDY, LARGE AIRCRAFT GAS
TURBINE ENGINE ADVANCED BEARING AND SEAL TECHNOLOGY
WAS REVIEWED TO DETERMINE THOSE CONCEPTS WHICH MAY BE
APPLICABLE TO SMALL, ADVANCED, FRONT DRIVE TURBOSHAFT
ENGINES IN THE 2- TO 10-LB/SEC AIRFLOW SIZE. BASED
ON THIS REVIEW AND A STUDY OF SIMPLE MECHANICAL
ARRANGEMENTS WHICH APPEAR TO BE FEASIBLE, PROBLEMS
ASSOCIATED WITH THE DESIGN OF THE BEARINGS AND SEALS
IN THESE SMALL, ADVANCED TURBOSHAFT ENGINES ARE
DISCUSSED. FINALLY, DESIGN APPROACHES AND TEST
PROGRAMS REQUIRED TO PROVIDE SOLUTIONS TO THESE
PROBLEMS ARE RECOMMENDED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENLS

AD-729 643 9/1
NAVAL RESEARCH LAB ORLANDO FLA UNDERWATER SOUND REFERENCE
DIV

THE DESIGN OF DEEP-SUBMERGENCE
HYDROPHONES.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
SEP 71 SIP GROVES, IVOR D., JRI
PROJ: SF11-121-302-14083, NRL-S02-32
MONITOR: NRL 7339

UNCLASSIFIED REPORT

DESCRIPTORS: (*HYDROPHONES, DESIGN),
PIEZOELECTRIC CRYSTALS, DEEP SUBMERGENCE, O-RINGS,
CORROSION, SENSITIVITY, SPECIFICATIONS,
STABILITY, LIFE EXPECTANCY, ELASTOMERS,
METALS

(U)

IDENTIFIERS: *PIEZOELECTRIC HYDROPHONES

(U)

THE GOALS AND ACHIEVEMENTS IN THE DEVELOPMENT OF A
LONG-LIFE, DEEP-SUBMERGENCE, WIDE-FREQUENCY-RANGE
HYDROPHONE BASED ON TRIED AND PROVED DESIGNS AND
MATERIALS ARE SUMMARIZED. THE HYDROPHONE HAS BEEN
DIVIDED INTO SENSOR, PREAMPLIFIER, AND CABLE ASSEMBLY
COMPARTMENTS TO MINIMIZE FAILURE AND TO FACILITATE
CONSTRUCTION AND REPAIR. ALL JOINTS HAVE DOUBLE
O-RING SEALS. THE PIEZOELECTRIC ELEMENT IS
DOUBLE-BOOTED WITH BUTYL RUBBER AS THE WATER BARRIER.
EACH BOOT IS FILLED WITH DEGASSED, LOW-WATER-VAPOR
CASTOR OIL. ALL OF THE EXTERIOR METAL PARTS ARE
COVERED WITH AN ELASTOMER TO MINIMIZE CORROSION AND
TO REDUCE THE POSSIBILITY OF ELECTRICAL CROSSTALK.
FOURTEEN DIFFERENT SENSOR ELEMENTS WERE CONSTRUCTED
AND EVALUATED, AND FOUR HYDROPHONES OF ONE DESIGN
HAVE BEEN CONSTRUCTED TO GIVE 'IN-SERVICE'
EVALUATION. THE REPORT INCLUDES A DISCUSSION OF THE
SENSOR ELEMENT, CHARTS OF SENSITIVITY AND DIRECTIONAL
CHARACTERISTICS, PHOTOGRAPHS OF HYDROPHONES AND
SUBASSEMBLIES, AN ASSEMBLY DRAWING, AND A SET OF
SPECIFICATIONS. DATA ARE INCLUDED ON ELASTOMERS AND
METALS SUITABLE FOR USE AT DEPTHS AS GREAT AS 9000
METERS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEMLS

AD-731 356 11/6

NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

PROTECTION OF DSRV SEAL SEAT SURFACES
EXPOSED TO CYCLIC PRESSURE IN SEAWATER.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE NOV 68-MAR 70,
JUN 71 16P JENKINS, JAMES F. REINHART,
FRED M. I

REPT. NO. NCEL-TN-1160
PROJ: NCEL-52-003

UNCLASSIFIED REPORT

DESCRIPTORS: (•STAINLESS STEEL, •CORROSION),
(•DEEP SUBMERGENCE, UNDERWATER VEHICLES),
SILICONES, GREASES, PAINT PRIMERS, O-RINGS,
ENVIRONMENTAL TESTS, SEA WATER, PLASTIC COATINGS
IDENTIFIERS: •DEEP OCEAN VEHICLES, DEEP
SUBMERGENCE RESCUE VEHICLES

(U)

(U)

THE EFFICACY OF TWO COATING SYSTEMS IN PREVENTING
CORROSION OF SEAL SEATS SIMILAR TO THOSE USED FOR THE
THROUGH-HULL ELECTRICAL PENETRATORS ON THE DEEP
SUBMERGENCE RESCUE VEHICLE (DSRV) WAS
EVALUATED UNDER SIMULATED DSRV OPERATING
CONDITIONS. A VERY THIN (.0002 IN. TO .0003
IN.) WASH PRIMER REDUCED CORROSION OF THE SEAL
SEATS FOR A SHORT PERIOD AND A THICKER (.0023 IN.
TO .0025 IN.) COATING SYSTEM PREVENTED SEAL SEAT
CORROSION FOR 183 SIMULATED SERVICE CYCLES IN
PRESSURIZED SEAWATER. (AUTHOR)

(U)

UNCLASSIFIED

DDI REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZENL5

AD-865 361 11/1 13/10
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SEAL SYSTEMS IN HYDROSPACE, PHASE III:
EFFECTS OF LONG TERM HYDROSPACE EXPOSURE ON
SEAL SYSTEM INTEGRITY, 189 DAYS AT 5,900
FEET.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE APR 68-JUN 69,
JAN 70 48P JENKINS, JAMES F. REINHART,
FRED M. ;
REPT. NO. NCEL-TN-1072
PROJ: YF38.535.005.01.008

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPT. NO. NCEL-TN-1022
DATED MAR 69, AD-684 080.

DESCRIPTORS: (•UNDERWATER VEHICLES, HERMETIC
SEALS), (•HERMETIC SEALS, LIFE EXPECTANCY),
RELIABILITY, LIQUID IMMERSION TESTS, SEA WATER,
O-RINGS, METAL SEALS, LEAKAGE (FLUID),
CORROSION INHIBITION, JOGS, TEST METHODS
IDENTIFIERS: LIP SEALS

(U)

(U)

LONG TERM EFFECTS OF HYDROSPACE ON SEALS AND
GASKETS ARE UNDER INVESTIGATION AT NCEL (NAVAL
CIVIL ENGINEERING LABORATORY). PHASE III
INCLUDES THE EVALUATION OF FIFTEEN SEAL SYSTEMS AND
FIVE METALLIC SEAL FLANGE MATERIALS AFTER EXPOSURE TO
THE MARINE ENVIRONMENT FOR 189 DAYS AT A DEPTH OF 5,
900 FEET IN THE PACIFIC OCEAN. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZEMLS

AD-870 494 13/5 9/1
SACLANT ASM RESEARCH CENTRE LA SPEZIA (ITALY)

A CABLE GLAND FOR DEEP-SEA
OPERATION.

(U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,
MAR 70 17P MIASCHI, BRUNO I
REPT. NO. SACLANTCEN-TH-149

UNCLASSIFIED REPORT

DESCRIPTORS: (•WATERTIGHT FITTINGS, UNDERWATER
EQUIPMENT), ELECTRIC CABLES, ELECTRIC CONNECTORS,
O-RINGS, BUSHINGS, EPOXY PLASTICS, ELECTRIC
INSULATION, SYNTHETIC RUBBER, RUBBER, DESIGN,
RELIABILITY, DEEP WATER, HYDROSTATIC PRESSURE
IDENTIFIERS: NEOPRENE, •CABLE GLANDS

(U)

(U)

AN UNDERWATER MULTI-CABLE GLAND USED FOR CONNECTING
SENSORS SUBJECT TO HYDROSTATIC PRESSURE TO ELECTRONIC
EQUIPMENT LOCATED IN PRESSURE-RESISTANT CONTAINERS IS
DESCRIBED. IN ITS PRESENT FORM THE GLAND IS FOR USE
ONLY WITH NEOPRENE OR RUBBER SHEATHED CABLES.
SAMPLES OF THE ASSEMBLY HAVE BEEN IN REGULAR
OPERATIONAL USE AT WATER DEPTHS DOWN TO 3600 M DURING
THE LAST TWO YEARS. (AUTHOR)

(U)

VII. PLASTIC AND VACUUM SEALS

110a

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-410 016

AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD
MASS

EPOXY VACUUM SEAL FOR INTRODUCTION OF LEADS INTO
CRYOGENIC EQUIPMENT, (U)

MAR 63 4P LIPSON, HERBERT G.
BOUTHILLETTE, LIONEL O.
TASK: PROJ. 4608
MONITOR: AFCNL 63 78

UNCLASSIFIED REPORT

DESCRIPTORS: (•VACUUM SEALS, PLASTIC SEALS),
(•PLASTIC SEALS, VACUUM SEALS), CRYOGENICS,
ELECTRIC WIRE, THERMOCOUPLES, ELECTRICAL
EQUIPMENT, EPOXY PLASTICS. (U)
IDENTIFIERS: 1963. (U)

A VACUUM-TIGHT REPLACEABLE SEAL FOR THE INTRO
DUCTION OF THERMOCOUPLE OR ELECTRICAL LEADS INTO
CRYOGENIC EQUIPMENT IS DESCRIBED. THIS SEAL WHICH
PRODUCES NO THERMAL EMF'S AT THE JUNCTIONS IS EASILY
CONSTRUCTED FROM COMMERCIALY AVAILABLE PARTS WITH
EPOXY CEMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 72FHL5

AD-423 599

FLUOROCARBON CO PINE BROOK N J TIMELY TECHNICAL PRODUCTS
DIV

INVESTIGATION OF SEAL DESIGN AND SEALING TECHNIQUES
FOR KEL-F, TEFLON AND HALON. (U)

DESCRIPTIVE NOTE: COMPREHENSIVE REPT. NO. 3 (FINAL).
JAN 64 67P PISZKO, JOHN J. 1
CONTRACT: DA18 108AMC111A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•HALOCARBON PLASTICS, FLUORINE COMPOUNDS),
(•PLASTIC SEALS, HALOCARBON PLASTIC), ALKENES, CHLORINE
COMPOUNDS, SEALING COMPOUNDS, SEALS (STOPPERS),
PROCESSING (U)

IDENTIFIERS: 1964, HALON, KEL - F, TEFLON, SPIN
SEALING, PLUG SEALING (U)

THE PURPOSE OF THE WORK PERFORMED WAS TO DEVELOP
SEALING PROCESSES FOR KEL-F, TEFLON F&P AND
HALON. A SEALING METHOD IS DESIRED TO
HERMETICALLY SEAL A CONTAINER WHICH WILL WITHSTAND
150 PSI INTERNAL AIR PRESSURE AND A HELIUM LEAK TEST.
THE WORK WAS CONCENTRATED ON INDUCTION HEAT
SEALING, SPIN SEALING, SEALING WITH SPECIAL
FLUOROCARBON BASE SEALING, MATERIAL, AND CONTACT
HEAT SEALING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 72FHLB

AD-429 993

GENERAL ELECTRIC CO OWENSBORO KY

7480 CERAMIC TRIODE, PRODUCTION ENGINEERING
MEASURE.

(U)

DESCRIPTIVE NOTE: QUARTERLY PROGRESS REPT., NO. 5, 1
JULY-30 SEP 63,

SEP 63 26P MARSHALL, J. D. 3

CONTRACT: DA36 D39SC06738

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (1) TRIODES, PRODUCTION), (1) VACUUM SEALS,
TRIODES), LIFE EXPECTANCY, TEST EQUIPMENT (ELECTRONIC),
VACUUM PUMPS, TESTS, DIFFUSION PUMPS

(U)

IDENTIFIERS: 1943, ION PUMPS

(U)

TH ION PUMP VACUUM EXHAUST EQUIPMENT HAS BEEN
PLACED IN OPERATION. TUBES HAVE BEEN MADE FOR
COMPARISON OF THIS TYPE OF VACUUM SYSTEM AND THE
PRESENT OIL-DIFFUSION TYPE VACUUM SYSTEM. THE
RESULTS OF LIFE TESTS ON TUBES OF THE LOT FROM WHICH
THE SECOND ENGINEERING SAMPLE WAS DRAWN ARE
PRESENTED. (AUTHOR)

(U)

117

UNCLASSIFIED

72FHLB

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AU-627 23J 11/1 13/7
NAVY MARINE ENGINEERING LAB ANNAPOLIS MD

SELF-LUBRICATED SEALS DEVELOPMENT FOR HIGH-PRESSURE,
OIL-FREE COMPRESSORS. (U)

DESCRIPTIVE NOTE: PHASE REPT.,
JAN 66 23P WARD, JOHN R. ;
REPT. NO. MEL-399/65
PROJ: S-F013-08-05
TASK: 4090

UNCLASSIFIED REPORT

DESCRIPTIONS: (•SEALS(STOPPERS), HIGH-PRESSURE
COMPRESSORS), (•PLASTIC SEALS, HIGH-PRESSURE
COMPRESSORS), GAS SEALS, HALOGENATED HYDROCARBONS,
PISTONS, MATERIALS, WEAR RESISTANCE, LIFE
EXPECTANCY (U)
IDENTIFIERS: SELF-LUBRICATED SEALS (U)

CONTINUED PROGRESS IN THE DEVELOPMENT OF
SELF-LUBRICATED PISTON AND ROD SEALS FOR OIL-FREE,
HIGH-PRESSURE AIR COMPRESSORS IS DESCRIBED. SEAL
MATERIAL CHARACTERISTICS BASED ON FILLED
POLYTETRAFLUOROETHYLENE (PTFE) AS WELL AS NEW,
POTENTIALLY IMPROVED SEAL MATERIALS ARE DISCUSSED.
PISTON SPEEDS UP TO 450 FEET PER MINUTE WERE
INVESTIGATED. WEAR RESULTS FROM SEVERAL LONG-TERM
TESTS AT 4500 AND 5000 POUNDS PER SQUARE INCH ARE
SHOWN. A USEFUL PISTON SEAL LIFE EXCEEDING 2000
HOURS WAS DEMONSTRATED. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFALB

AD-633 895 11/1 13/5
DEPARTMENT OF THE NAVY WASHINGTON D :

TIGHTENING FLANGE JOINTS BY MEANS OF HERMETICALLY
SEALING PLASTIC. (U)

66 5P RAZDROGIN.YU. V. I
RLPI. NO. TRANSLATION-2098,
NUMBER: TT : 66-61431

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UPLOTNENIE FLANTSEVYKH SUEGINENII
S POMOSHCHYU GERMETIZIRUYUSHCHEI PLASTMASSY, TRANS. OF
SUDOSTROENIE (USSR) NO P76-7 1965.

DESCRIPTORS: (PLASTIC SEALS, JOINTS), FLANGES,
HERMETIC SEALS, EPOXY PLASTICS, BOLTED JOINTS,
METAL JOINTS, USSR, EFFECTIVENESS (U)

UNUSUAL WATERTIGHTNESS OF FLANGE JOINTS IS OBTAINED
BY PLACING A SUITABLE PACKING BETWEEN THE TIGHTENING
FLANGES. ADDITIONAL ADJUSTING WORK IN ASSEMBLING
FLANGE JOINTS MAY BE AVOIDED BY USING A SPECIAL
BINDING PLASTIC DEPOSITED ON THE TIGHTENING SURFACES
OF THE FLANGES WHICH FILLS ALL THE MICRO- AND MACRO-
IRREGULARITIES WHEN TIGHTENING THE FLANGES WITH THE
JOINING BOLTS. UNDER SUCH CONDITIONS THE PLASTIC
MUST BE SELF HARDENING. THE INDICATED REQUIREMENTS
ARE MET BY HERMETICALLY SEALING PLASTIC BASED ON AN
EPOXY RESIN MARK ED-5 (ITU LSNKH NO. 33029-
59) AND AN EPOXY PUTTY MARK EPOOIO (GOST 10277-
62). POLYETHYLENEPOLYAMIN (VTU MKHP NO. P-10-
57) SERVES AS THE HARDENING AGENT, PORTLAND CEMENT
500 (GOST 965-41) AND CHOPPED GLASS FIBER (VTU
NO. 836-60) AS FILLERS. A HERMETICALLY SEALING
PLASTIC IS RESISTANT TO VIBRATION AND IMPACT LOADS,
AND TO OIL AND GASOLINE AND AS A CONSEQUENCE OF ITS
INSIGNIFICANT SHRINKING IT MAINTAINS RELATIVELY
STABLE CONDITION OF THE JOINED FLANGES. (U)

JOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-650 315 11/1 7/3
 OLIN MATTHEWSON CHEMICAL CORP NEW HAVEN CONN CHEMICALS
 GROUP

DEVELOPMENT OF SOLVENT-RESISTANT SEALANTS. (U)

DESCRIPTIVE NOTE: FINAL REPT., 1 FEB 66-31 JAN 67,
 FEB 67 48P DOUDAKIAN, M. M. IRAES, M.
 C. TUNIS, S. V. I
 CONTRACT: HON-66-0323

UNCLASSIFIED REPORT

DESCRIPTORS: (SEALS, MATERIALS), (PLASTIC
 SEALS, STABILITY), (ISOCYANATE PLASTICS,
 PLASTIC SEALS), (EPOXY PLASTICS, PLASTIC
 SEALS), HALOGENATED HYDROCARBONS, FLUORINE
 COMPOUNDS, ETHERS, ALCOHOLS, POLYMERIZATION,
 CURING AGENTS, PHENOLS, AMINES, HALOCARBON
 PLASTICS, SUBSTRATES, ALUMINUM, SOLVENTS (U)

URETHANE TYPE SEALANTS COMPOUNDED FROM CF₃ AND
 CF₂IS-CONTAINING POLYETHER TRIOLS, TOLUENE
 DIISOCYANATE AND MOISTURE CURED WERE DEVELOPED WITH
 GOOD RESISTANCE TO PAINT-STRIPPER SOLVENTS, HIGH
 MECHANICAL PROPERTIES AND EXCELLENT ADHESION TO
 ALUMINUM SUBSTRATE. A NUMBER OF FLUORINE-
 CONTAINING MONO- AND DIGLYCIDYL ETHERS,
 PERFLUORINATED EPOXIDES AND FLUORINE-RICH DIAMINES
 AND POLYOLS WERE SYNTHESIZED FOR COMPOUNDING INTO
 URETHANE- AND EPOXY-TYPE SEALANTS. IT IS
 RECOMMENDED TO CARRY OUT A DETAILED EVALUATION OF THE
 COMPOUNDS TO SELECT A CANDIDATE FOR FIELD TRIAL.
 (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-655 567 13/11
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

METHOD OF PUMPING OF VACUUM SYSTEMS, (U)

FEB 67 6P MARTINSON, L. N. PLECHEV,
V. 1, ;
REPT. NO. FTD-HT-67-17

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SPUSOB OTKACHKI VAKUUMNYKH
SISTEM, UNEDITED ROUGH DRAFT TRANS. OF PATENT (USSR)
164 920, APPL. BU9519/24-6, 21 DEC 62.

DESCRIPTORS: (*VACUUM PUMPS, *VACUUM SEALS),
HELIUM GROUP GASES, NITROGEN, SORPTION, FLUSH
VALVES, USSR (U)

THE ARTICLE DESCRIBES A METHOD OF PUMPING OUT
VACUUM SYSTEMS WITH THE AID OF SORPTION PUMPS, WHICH
FOR THE PURPOSE OF REMOVING INERT GASES AND ATTAINING
A HIGHER VACUUM, THE SYSTEM OF PERIODICALLY FLUSHING
OUT WITH GASEOUS NITROGEN IS USED. (AUTHOR) (U)

UNCLASSIFIED

JDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-695 739 11/1 9/1
CALIFORNIA UNIV LOS ANGELES DEPT OF PHYSICS

A SIMPLE HIGH VOLTAGE VACUUM SEAL, (U)

APR 69 2P MACKENZIE, K. R. ;
CONTRACT: AF-AFOSR-1447-68
PMUJ: AF-9767
TASK: 976703
MONITOR: AFOSR 69-2624TR

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN REVIEW OF SCIENTIFIC
INSTRUMENTS, VAC NB P1107-1108 AUG 69.

DESCRIPTORS: (*VACUUM SEALS, DESIGN), (*GLOW
DISCHARGES, RADIOFREQUENCY), DIRECT CURRENT,
ELECTRODES, O-RINGS, HALOCARBON PLASTICS,
RELIABILITY (U)

IDENTIFIERS: HIGH VOLTAGE, VACUUM PLATES,
CREEPAGE PATHS (U)

A HIGH VOLTAGE VACUUM SEAL IS DESCRIBED WHICH HAS
LOW RF LOSSES AND A LONG CREEPAGE PATH. IT USES
TEFLON AS THE INSULATOR. CONSTRUCTION AND
INSTALLATION ARE DESCRIBED. (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 7ZFMLS

AD-697 029 11/10 21/8
AEROSPACE CORP EL SEGUNDO CALIF SYSTEMS ENGINEERING
OPERATIONS

EXPOSURE OF ELASTOMERS TO HYDRAZINE AND AIR, WATER
VAPOR, OR CARBON DIOXIDE. (U)

JUL 69 10P TAKIMOTO, HIDEYO H. IDENAULT,
GENEVIEVE C. MARSH, PETER A. ;
REPT. NO. TR-0066(5135-01)-1
CONTRACT: F04701-69-C-0066
MONITOR: SAMSO TR-69-344

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: FORMERLY AVAILABLE AS AEROSPACE
REPT. NO. TR-0200(4135-01)-1

DESCRIPTORS: (*ELASTOMERS, ENVIRONMENTAL TESTS),
(*HYDRAZINE, ELASTOMERS), (*LIQUID ROCKET
PROPELLANTS, *PLASTIC SEALS), TEST METHODS,
CARBON DIOXIDE, AIR, WATER VAPOR, VALVES (U)
IDENTIFIERS: ETHYLENE COPOLYMERS, PROPYLENE
COPOLYMERS (U)

SPECIMENS OF STILLMAN RUBBER (SR) 721-P80
AND SR 724-Y0 (FORMS OF ETHYLENE-PROPYLENE
RUBBER) POTENTIAL ELASTOMERS FOR VALVE SEAT
APPLICATIONS IN HYDRAZINE MONOPROPELLANT SYSTEMS,
WERE ALTERNATELY EXPOSED TO HYDRAZINE AND EITHER AIR,
WATER VAPOR, OR CARBON DIOXIDE. THE WEIGHT CHANGES
OF THE ELASTOMERS WERE DETERMINED DURING THESE CYCLIC
EXPOSURES, AND PERIODIC CHECKS OF THE THICKNESS
CHANGES WERE MADE. THE WEIGHT CHANGE FOR SR 724
LEVELED OFF AT 2 TO 3 PERCENT, WHILE THAT OF SR 721
CONTINUED TO INCREASE WITH THE NUMBER OF CYCLES
(FOR HYDRAZINE AND VAPOR, 26 PERCENT AFTER 40
CYCLES). SR 724 IS SUPERIOR TO SR 721 IN TERMS
OF ITS SWELLING CHARACTERISTIC WITH HYDRAZINE WHEN
PERIODIC EXPOSURES TO AIR ARE ENCOUNTERED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-698 685 1772 1171
GENERAL CABLE CORP DAYONNE N J

PRESSURE DAMS IN COMMUNICATION CABLES,

(U)

UCT 69 16P MASTERSON, J. B. I

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT INTERNATIONAL WIRE
AND CABLE SYMPOSIUM (18TH), ATLANTIC CITY, N.
J. 3-5 DEC 69.

DESCRIPTORS: (*TELEPHONE LINES, PLASTIC SEALS),
(*PLASTIC SEALS, *ISOCYANATE PLASTICS),
PRESSURE, AGING(MATERIALS), PHYSICAL
PROPERTIES

(U)

THE POLYURETHANE COMPOUNDS AS USED TODAY ARE AN
IMPROVEMENT OVER THE PREVIOUSLY-USED EPOXY SYSTEMS.
THEY EXHIBIT BETTER AGING PROPERTIES AND LOWER PEAK
EXOTHERMS. FURTHER WORK IS NECESSARY IN THE
DEVELOPMENT OF POLYURETHANE DAMMING COMPOUNDS, TO
LOWER THE FREE TDI AND TO PROVIDE GREATER LONG
TERM HYDROLYTIC STABILITY. PLASTICIZERS AND OTHER
MATERIALS USED TO MODIFY THE PHYSICAL PROPERTIES OF
THE MATERIALS MUST NOT BE USED TO THE DETRIMENT OF
THE MATERIAL'S ABILITY TO FORM A GOOD DAM. UNDER
EXTREME CONDITIONS OF TEMPERATURE AND HUMIDITY THESE
POLYURETHANE COMPOUNDS MAY REVERT HYDROLYTICALLY.
PROJECTED LIFE BASED ON THE TIME TO LIQUIFY IS ONLY
ONE INDICATOR OF THE LONG-TIME PERFORMANCE OF THE
COMPOUND. COMPOUNDS SUSCEPTIBLE TO WEIGHT LOSS AS
A RESULT OF AGING MAY ALSO FAIL IN SERVICE. THE
TOXICITY OF THE FREE ISOCYANATE IN THE PREPOLYMER IS
DEFINITELY HAZARDOUS TO THE USER. RESIDUAL TDI
EXISTING AFTER THE COMPOUND HAS BEEN REACTED MUST
ALSO BE CONSIDERED AS A POTENTIAL HAZARD.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-713 620 11/6 11/4 11/9
MARTIN MARITTA CORP DENVER COLO DENVER DIV

CRYOGENIC MATERIALS DATA HANDBOOK (REVISED).
VOLUME II. SECTIONS D, E, F, G, H AND
I. (U)

DESCRIPTIVE NOTE: TECHNICAL DOCUMENTARY REPT.,
JUL 70 552P SCHWARTZBERG, FRED M. I
OSGOOD, SAMUEL H. ; BRYANT, CAROL ; KNIGHT, MARVIN
;

CONTRACT: AF 33(657)-9161, FJ3615-67-C-1794
PROJ: AF-7381
TASK: 730106
MONITOR: AFML TOR-64-280-VOL-2-REV

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REVISION OF REPORT DATED AUG 64,
AD-609 562 AND SUPPLEMENT 4 DATED AUG 68, AD-679
087. SEE ALSO VOLUME I, REVISED, AD-713 619.

DESCRIPTORS: (*CRYOGENICS, *HANDBOOKS), (*NICKEL
ALLOYS, CRYOGENICS), (*STEEL, CRYOGENICS),
(*POLYMERS, CRYOGENICS), (*REINFORCED PLASTICS,
CRYOGENICS), (*SEALS, CRYOGENICS), (*COPPER
ALLOYS, CRYOGENICS), GASKETS, MECHANICAL
PROPERTIES, NYLON, EPOXY PLASTICS, POLYESTER
PLASTICS, COMPOSITE MATERIALS, TEST METHODS (U)
IDENTIFIERS: INCUNEL, *TETRAFLUOROETHYLENE RESINS,
*FIBERGLASS REINFORCED PLASTICS, (U)
*POLYCHLOROTRIFLUORO ETHYLENE (U)

THE REPORT CONTAINS INFORMATION ON THE CRYOGENIC
MECHANICAL PROPERTIES OF SUPERALLOYS, STEEL,
MISCELLANEOUS METALS AND ALLOYS, POLYMERS, FIBER
REINFORCED PLASTICS, AND SEALS AND GASKETS. (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFML5

AD-720 928 11/1 11/4 11/9
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

POSSIBLE USE OF MATERIALS BASED ON
POLYTETRAFLUOROETHYLENE FOR PACKING DRILLING
PUMPS. (U)

DEC 70 BP POTUSHANSKII, A. A. I
REPT. NO. FTD-HT-23-771-70
PROJ: FTD-7343

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UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF PROBLEMY GEOLUGII
I TEKHNIKI OSVOENIYA SVERKHLUBOKOGO BURENIYA NA
NEFT I GAS V UKRAINSKOI SSR, RESPUBLIKANSKOGO
SOVESHCHANIYA, KIEV, FEB 68. MATERIALY (PROBLEMS
OF THE GEOLOGY AND TECHNIQUES FOR PERFORMING EXTRA-
DEEP DRILLING FOR PETROLEUM AND GAS IN THE UKRAINIAN
SSR, REPUBLIC CONFERENCE, KIEV, FEB 68.
MATERIAL), KIEV, 1969 P249-251, BY V. MESENZEFF.

DESCRIPTORS: (*HALOCARBON PLASTICS, PLASTIC
SEALS), (*PLASTIC SEALS, *PUMPS), COMPOSITE
MATERIALS, HALOCARBON PLASTICS, FLUORINE COMPOUNDS,
WEAR RESISTANCE, DRILLING, MECHANICAL PROPERTIES,
USSR (U)

IDENTIFIERS: *WELL PUMPS, *TETRAFLUOROETHYLENE
RESINS, *FILLED THERMOPLASTICS, TRANSLATIONS (U)

A TECHNIQUE WAS DEVELOPED FOR THE MIXING OF
FIDROPLAST-4 POLYTETRAFLUOROETHYLENE (1) WITH
FILLERS IN A SPECIALLY DESIGNED MIXER. THE
REINFORCED 1 EXHIBITED SUPERIOR THERMAL
CONDUCTIVITY, HARDNESS, COMPRESSION STRENGTH, AND
WEAR RESISTANCE. WHEREAS ITS THERMAL EXPANSION
COEFFICIENT MARKEDLY DECLINED. REINFORCED 1 WAS
USED AS A SEALANT FOR PNEUMATIC COMPRESSORS AND
EXPANSION ENGINES OPERATING UNDER HIGH PRESSURES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 72FMLS

AD-720 988 1976
NATCHELLET ARSENAL N Y

SILICONE-ASBESTOS OBTURATOR PADS FOR 175MM
GUN, M113A 1. A PRODUCT IMPROVEMENT.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 71 44P HYNES, JAMES T. I
REPT. NO. WVT-7101

UNCLASSIFIED REPORT

DESCRIPTORS: (*BREACH MECHANISMS, *SEALS), GUNS,
SILICONE PLASTICS, ASBESTOS
IDENTIFIERS. M-113 GUNS(175-MM), *OBTURATOR
PADS

(U)

(U)

THE PURPOSE OF THE INVESTIGATION WAS TO DESIGN AN
ALL-WEATHER OBTURATOR PAD THAT COULD BE USED IN THE
175MM CANNON M113A1. MANY TEST PADS WERE
FABRICATED AND FIRED WITH TEMPERATURES VARYING FROM -
50F TO +145F. THE SILICONE-ASBESTOS COMPOSITE
PAD WAS FOUND TO PERFORM MOST SATISFACTORILY AFTER
FIRING OVER 10,000 ROUNDS AT ALL FIRING ZONES AT ALL
WEATHER CONDITIONS. THIS DESIGN IS SUCH THAT WITH
FURTHER WORK IT CAN BE ADAPTED TO OTHER BAG LOADED
CANNON. (AUTHOR)

(U)

JOL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-728 039 11/1 11/3 1/3
 Vought Aeronautics Co Dallas Tex

DEVELOPMENT OF FASTENER COUNTERSINK CORROSION
 PROTECTION SEALS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 24 JAN 70-24 APR 71,
 APR 71 69P KELLY, G. W. I
 REPT. NO. VAC-2-53110/IR-2916
 CONTRACT: N00019-70-C-0244

UNCLASSIFIED REPORT

DESCRIPTORS: (*PLASTIC SEALS, *MECHANICAL
 FASTENERS), (*CORROSION INHIBITION, *PLASTIC
 COATINGS), AIRFRAMES, ISOCYANATE PLASTICS,
 ELASTOMERS, SILICONE PLASTICS

(U)

THE OBJECTS OF THE PROGRAM WERE TO MODIFY COATING
 MATERIALS FOR USE WITH SPECIALIZED APPLICATION
 EQUIPMENT, TO STUDY APPLICATION TECHNIQUES APPLICABLE
 TO PRODUCTION PRACTICES AND TO DEVELOP A COLOR STABLE
 (NON-YELLOWING) MATERIAL SUITABLE FOR THIS USE.
 ALL OBJECTIVES WERE ORIENTED TOWARD DEVELOPMENT OF
 AN ELASTOMERIC SEALANT SYSTEM DESIGNED FOR USE IN
 SEALING FASTENER-HEAD COUNTERSINKS IN HIGHLY LOADED
 AIRCRAFT SKINS THAT ARE SUSCEPTIBLE TO EXFOLIATION
 CORROSION. MATERIALS WERE FORMULATED THAT COULD BE
 SMOOTHLY DEPOSITED ON VERTICAL SURFACES TO
 THICKNESSES OF 5 TO 7 MILS PER PASS UTILIZING VAPOR-
 CARRIER TYPE SPRAY EQUIPMENT; OTHER MATERIALS
 FORMULATED FOR USE IN CONVENTIONAL APPLICATION
 EQUIPMENT WERE EASILY APPLIED TO AN AESTHETICALLY
 SMOOTH FINISH WITH A MINIMUM LOSS OF COATING BUILD
 PER PASS. THESE COATINGS WERE MANUFACTURED IN
 COMMERCIAL FACILITIES AND TEST RESULTS OBTAINED FROM
 THESE MATERIALS CORRELATED WITH LABORATORY
 EXPERIMENTAL DATA. MATERIALS AND APPLICATION
 TECHNIQUES DEVELOPED AS A RESULT OF THIS PROGRAM HAVE
 SIGNIFICANTLY REDUCED THE COSTS OF APPLYING FASTENER-
 COUNTERSINK SEALS TO PRODUCTION AIRCRAFT.
 (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-730 251 11/1
TEXAS TECH UNIV LUBBOCK DEPT OF ELECTRICAL
ENGINEERING

HEAT SHRINKABLE TUBING AS AN INEXPENSIVE
VACUUM SEAL, (U)

DEC 70 2P MOLEN, G. M. ; ROSELAND, L.
G. ; KRISTIANSEN, M. ; HAGLER, H. O. ;
CONTRACT: AF-AFOSR-1757-69
PROJ: AF-9752
TASK: 975201
MONITOR: AFOSR TR-71-2479

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF VACUUM SCIENCE
AND TECHNOLOGY, V8 N3 P515 MAY-JUN 71.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 14 DEC
70.

DESCRIPTORS: (•VACUUM SEALS, PIPES), JOINTS,
GLASS, METALS, ELECTRODES, LASERS, PRESSURE,
TESTS (U)
IDENTIFIERS: •HEAT SHRINKABLE TUBING (U)

HEAT SHRINKABLE TUBING HAS BEEN FOUND VERY USEFUL
AS A QUICK AND INEXPENSIVE VACUUM SEAL FOR JOINING
GLASS OR METAL TUBING WITHOUT THE USE OF GLASS
BLOWING OR VACUUM FLANGES. ONE SIZE CAN BE USED TO
CONNECT SEVERAL DIFFERENT SIZES OF GLASS OR METAL
TUBING, SINCE THE TUBING CAN SHRINK TO APPROXIMATELY
ONE HALF ITS ORIGINAL DIAMETER. THESE SEALS HAVE
BEEN USED FOR SEVERAL APPLICATIONS SUCH AS CONNECTING
ELECTRODES AND JOINING SECTIONS OF THE PLASMA TUBE OF
A CO₂ LASER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-735 230 11/1 20/12
CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF PHYSICS

A CONVENIENT AND RELIABLE DEMOUNTABLE SEAL
FOR LOW TEMPERATURE WORK.

(U)

JUN 71 JP MOTA, ANA CELIA ;
CONTRACT: AF-AFOSR-631-67, AT(04-3)-34
PROJ: AF-9764
TASK: 976402
MONITOR: AFOSR TR-72-0093

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN REVIEW OF SCIENTIFIC
INSTRUMENTS, V42 NO P1541-1542 OCT 71.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 5 MAY
71.

DESCRIPTORS: (•VACUUM SEALS, •CRYOGENICS),
(•SEALING COMPOUNDS, CRYOGENICS), MIXTURES,
GLYCEROLS, SOAPS, DESIGN, LIQUEFIED GASES

(U)

A MIXTURE OF GLYCERINE AND SOAP HAS BEEN USED FOR
MANY YEARS AS A MEANS TO MAKE A VACUUM SEAL AT LOW
TEMPERATURES. THE SEALING METHOD HAS NOT BEEN
GENERALLY RELIABLE, HOWEVER. IN THE REPORT, THE
AUTHORS PRESENT A GLYCERINE-SOAP MIXTURE TOGETHER
WITH A SEAL DESIGN WHICH DOES GIVE RELIABLE RESULTS
AND WHICH IS TIGHT TO SUPERFLUID HELIUM. THE SEALS
PROVIDE, AMONG OTHER USES, QUICK AND EASY ACCESS AT
ROOM TEMPERATURE TO A REGION WHICH WILL CONTAIN AT
LOW TEMPERATURE EITHER SUPERFLUID ⁴HE OR LIQUID
³HE. (AUTHOR)

(U)

UNCLASSIFIED

JDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-736 400

11/1

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

EXPERIMENTAL DETERMINATION OF THE COEFFICIENT
OF FRICTION DURING THE CONTACT OF A SPHERE WITH
A CONE.

(U)

NOV 71

BP

MUMYANTSEV, O. V. IPRUDAN,

V. O. IPENSHIN, F. F. ;

REPT. NO. FTD-MT-23-1374-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF MASHINOVEDENIE
(USSR) N4 PIU1-103 1970, BY K. DION.

DESCRIPTORS: (VACUUM SEALS, FRICTION),
LOADING (MECHANICS), SPHERES, CONICAL BODIES,
INTERFACES, EXPERIMENTAL DATA, USSR

(U)

IDENTIFIERS: TRANSLATIONS, COEFFICIENT OF
FRICTION

(U)

IT IS SHOWN THAT A COMMON TYPE OF VALVE SEALING
RESULTS FROM THE HIGH CONTACT STRESSES PROVIDED WHEN
A SPHERICAL SHAPE IS FORCED INTO A CONICAL
DEPRESSION. THIS WORK IS DEDICATED TO
DETERMINATION OF THE COEFFICIENT OF FRICTION IN THE
AREA OF RELATIVELY HIGH SPECIFIC PRESSURES UPON
CONTACT BETWEEN A SPHERE AND A CONE. IN THE
EXPERIMENTAL STUDY PERFORMED, THE SPHERE WAS REPLACED
BY A DEVICE WITH THREE LEGS EXTENDING AT EVEN
INTERVALS AROUND A CIRCLE FROM A CYLINDRICAL CENTER
SECTION. THE ENDS OF THE LEGS WERE WORKED INTO A
SPHERICAL SHAPE WITH A RADIUS OF 50 MM (REPLACEMENT
OF THE SPHERE WITH A ROD MODEL ALLOWED THE AUTHORS TO
STUDY THE PLANAR PROBLEM). (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZFMLS

AD-737 174 11/1 13/5
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG
MISS

INVESTIGATION OF NONMETALLIC WATERSTOPS.
REPORT 9. EFFECT OF SPECIMEN SIZE AND LOW
TEMPERATURE ON WATERSTOP TEST RESULTS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JAN 72 34P HOUSTON, BILLY J. ;
REPT. NO. AEWES-TR-6-546-8

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT 7, AD-714 219.

DESCRIPTORS: (JOINTS, PLASTIC SEALS), TEST
METHODS, STRESSES, RUBBER, POLYVINYL CHLORIDE,
PERFORMANCE (ENGINEERING), TEMPERATURE

(U)

IDENTIFIERS: JOINT SCALERS

(U)

TO PROVIDE INFORMATION CONCERNING THE RELATIONSHIP
BETWEEN TEST RESULTS OBTAINED FROM SMALL TEST
SPECIMENS OF WATERSTOP MATERIAL AS NOW SPECIFIED IN
CORPS OF ENGINEERS SPECIFICATIONS AND RESULTS
OBTAINED FROM FULL-WIDTH WATERSTOP SPECIMENS TESTED
WITH STRESS APPLIED IN THE DIRECTION IN WHICH IT
WOULD BE APPLIED BY JOINT MOVEMENT AS WELL AS
INFORMATION CONCERNING THE EFFECT OF LOW TEMPERATURE
ON WATERSTOPS UNDER STRESS, SIX WATERSTOPS WERE
TESTED, INCLUDING TWO- AND THREE-BULB SHAPES OF
NATURAL RUBBER AND POLYVINYLCHLORIDE (PVC), A
THREE-BULB NEOPRENE, AND A CORRUGATED FLANGE SHAPE
PVC. (AUTHOR)

(U)

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VIII. ROTARY SEALS

128a

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-283 365

GENERAL ELECTRIC CO CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE

(U)

JUL 62 1V

CONTRACT: AF33 657 8459

UNCLASSIFIED REPORT

DESCRIPTORS: *ROTARY SEALS, *SEALS (STOPPERS), DESIGN, DYNAMICS, EFFECTIVENESS, FLUID FLOW, FLUIDS, HIGH-TEMPERATURE RESEARCH, LIFE EXPECTANCY, LIQUID METALS, LOW-PRESSURE RESEARCH, POTASSIUM, RINGS, ROTATING STRUCTURES, SPACE ENVIRONMENTAL CONDITIONS, TEST EQUIPMENT, TEST METHODS, TESTS, TURBULENCE

(U)

INVESTIGATIONS CONTINUED CONCERNING TECHNIQUES FOR SEALING HIGH SPEED ROTATING SHAFTS UNDER THE OPERATING CONDITION OF HIGH TEMPERATURE LIQUID METALS AND VAPORS, THE NEAR-VACUUM ENVIRONMENTS OF SPACE, AND TO PROVIDE LONG SEAL LIFE. THE REQUIREMENTS ARE: THE WORKING FLUID IS K, THE OPERATING TEMPERATURE IS FROM MELTING POINT OF K TO 1400 F, THE INTERNAL PRESSURE IS 15 PSI AND EXTERNAL PRESSURE OF 10 TO THE -6TH POWER MM HG, THE SPEED OF THE ROTATING IS A MAXIMUM OF 36,000 RPM., AND IT SHALL HAVE AN OPERATING LIFE OF 10,000 HR. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-200 611

OKLAHOMA STATE UNIV STILLWATER SCHOOL OF MECHANICAL
ENGINEERING

A STUDY IN THE FIELD OF FLUID SEALS FOR HIGH SPEED
ROTATING EQUIPMENT (U)

SEP 59 1V CHAPEL, R.E.; SCHLAPBACH, M.E.; HALL,
L.F.;
CONTRACT: AF34 601 5470

UNCLASSIFIED REPORT

DESCRIPTORS: *HYDRAULIC SEALS, *ROTARY PUMPS, *ROTARY
SEALS, ASBESTOS, BIBLIOGRAPHIES, BUSHINGS, CONTAINERS,
ELASTOMERS, FAILURE (MECHANICS), FLANGES, FLUID
MECHANICS, FLUOROCARBONS, FRICTION, GASKETS, LEATHER,
METAL SEALS, PISTON RINGS, PLASTIC SEALS, POLYMERS,
RECIPROCATING PUMPS, RUBBER SEALS, SCREW THREADS, SEALS
(STOPPERS), SILICONES, SYNTHETIC RUBBER (U)
IDENTIFIERS: O RINGS (U)

MANY TYPES OF SEALS HAVE BEEN DESIGNED FOR USE IN
RECIPROCATING OR ROTATING MACHINES. IN RECENT
YEARS, PARTICULARLY IN MILITARY APPLICATIONS, THE
SEALING PROBLEM HAS BECOME COMPLEX. HIGH CONTACT
SPEEDS, EXTREME TEMPERATURES, AND SUPERPRESSURES HAVE
PRESENTED THE DESIGNER WITH SOME CHALLENGING
PROBLEMS. THE SEALS FOR NEW APPLICATIONS USUALLY
ARE DEVELOPED BY EXTRAPOLATING DATA FROM PREVIOUS
DESIGNS. MOST OF THE RECENT INVESTIGATIONS HAVE
BEEN EXPERIMENTAL EVALUATIONS OF NEW MATERIALS. THE
WEAR RATE, LEAKAGE, AND FRICTIONAL DRAG OF THE
MATERIAL ARE OBSERVED OVER A RANGE OF SPEEDS,
TEMPERATURES AND PRESSURES. THERE IS LITTLE
EVIDENCE IN THE LITERATURE OF ANALYTICAL STUDIES THAT
PERTAIN TO DYNAMIC FLUID SEALS. A FEW TYPES, SUCH
AS THE LARYRINTH SEAL, HAVE A WELL DEVELOPED
THEORETICAL ANALYSIS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-295 700

GENERAL ELECTRIC CO CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE

(U)

OCT 62 1V
CONTRACT: AF33 657 8459

UNCLASSIFIED REPORT

DESCRIPTORS: *ROTARY SEALS, *SEALS (STOPPERS), DESIGN,
DISKS, FLUID FLOW, FLUIDS, HYDRODYNAMICS, LIQUID METALS,
LUBRICANTS, POTASSIUM, RINGS, ROTATING STRUCTURES,
SHAFTS, SPACE ENVIRONMENTAL CONDITIONS, SPACECRAFT, TEST
EQUIPMENT, TEST METHODS, WATER (U)

UNCLASSIFIED

DNC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-400 255

HOTPOINT INC CHICAGO ILL

DYNAMIC SHAFT SEALS IN SPACE

(U)

JAN 67 1V

CONTRACT: AF33 657 8459

UNCLASSIFIED REPORT

DESCRIPTORS: *ROTARY SEALS, *SEALS (STOPPERS), DISKS,
FLUID FLOW, LIFE EXPECTANCY, LIQUID METALS, LUBRICANTS,
MANUFACTURING METHODS, POTASSIUM, SHAFTS, SPACE
ENVIRONMENTAL CONDITIONS, TEST EQUIPMENT, TEST METHODS,
TESTS (U)

SEALING HIGH SPEED ROTATING SHAFTS UNDER OPERATING
CONDITIONS OF HIGH TEMPERATURE LIQUID METALS AND VAPORS
IN A NEAR-VACUUM ENVIRONMENT OF SPACE.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-405 056

GENERAL ELECTRIC CO CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE.

(U)

DESCRIPTIVE NOTE: QUARTERLY PROJ. STATUS REPT. NO. 4 FOR
PERIOD ENDING 15 APR 63.

APR 63 100P

CONTRACT: AF33 657 8459

UNCLASSIFIED REPORT

DESCRIPTORS: *ROTARY SEALS, *SEALS (STOPPERS),
LIQUID METALS, POTASSIUM, HIGH-TEMPERATURE
RESEARCH, PRESSURE, MAINTAINABILITY, LIFE
EXPECTANCY, TESTS, RINGS, DESIGN, LUBRICANTS,
TEST METHODS, PARTIAL DIFFERENTIAL EQUATIONS,
REYNOLDS NUMBER, COUETTE FLOW, LAMINAR FLOW,
TURBULENCE, SHAFTS, SPACE ENVIRONMENTAL
CONDITIONS.

(U)

DYNAMIC SHAFT SEALS IN A SPACE ENVIRONMENT.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-406 307

FRANKFORD ARSENAL PHILADELPHIA PA

DETERMINATION OF THE MECHANISMS GOVERNING THE INFLOW
OF MOISTURE PAST A ROTARY SEAL - THEORETICAL MODEL,

(U)

JAN 63 89P HOFFMAN, BERNARD ;
MONITOR: FA TM M63 1 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: *FIRE CONTROL SYSTEM COMPONENTS, *SEALS
(STOPPERS), *MOISTURE, *WATER VAPOR, *ROTARY SEALS,
DESIGN, EQUATIONS, RUBBER GASKETS, INJECTION,
INSTRUMENTATION, CONFIGURATION, DIFFUSION, TRANSPORT
PROPERTIES, TEMPERATURE, PRESSURE, HUMIDITY,
DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS,
MOISTUREPROOFING

(U)

EFFORTS WERE MADE TO DETERMINE A METHOD FOR
ACHIEVING AN EFFECTIVE MOISTURE BARRIER FOR FIRE
CONTROL INSTRUMENTS. A DESCRIPTION IS PRESENTED OF
THE PROBABLE MECHANISMS GOVERNING THE INFLOW OF WATER
AND ITS VAPOR THROUGH ROTARY SEALS. THE MECHANISMS
WERE DETERMINED FROM: (1) A SEARCH OF THE
TECHNICAL LITERATURE PERTAINING TO THE MASS TRANSFER
OF WATER, ITS VAPOR AND RELATED PHENOMENA; (2)
CONSULTATIONS WITH INVESTIGATORS WHO ARE ACTIVE IN
THE FIELDS OF SCIENCE RELATED TO WATER VAPOR AND
WATER VAPOR PHENOMENA; AND (3) PREVIOUSLY
DEVELOPED INTUITIVE AND STATISTICAL REASONING.
UTILIZING THE DERIVED MECHANISMS, CALCULATIONS ARE
MADE TO OBTAIN ENGINEERING ESTIMATES OF PROBABLE
LEAKAGES THROUGH ACTUAL ROTARY SEALING SYSTEMS
(SYSTEMS EMPLOYING ROTARY 'O'-RINGS). A DESIGN
OF EXPERIMENT IS PROPOSED FOR PROVING OUT THE
MECHANISMS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-406 308

FRANKFORD ARSENAL PHILADELPHIA PA

DETERMINATION OF THE MECHANISMS GOVERNING THE INFLOW
OF MOISTURE PAST A ROTARY SEAL. (U)

DESCRIPTIVE NOTE: STATUS REPT..

JAN 63 45P

PROJ: 513 01 00A

MONITOR: FA M63 1 2

UNCLASSIFIED REPORT

DESCRIPTORS: *TEST FACILITIES, *ROTARY SEALS,
FIRE CONTROL SYSTEMS, MOISTURE, FLUID FLOW,
DIFFUSION, VISCOSITY, COSTS, DESIGN, TESTS. (U)
IDENTIFIERS: LEAKAGE. (U)

THE DESIGN OF AN EXPERIMENT TO VERIFY THE MECHANISMS GOVERNING THE TRANSPORT OF MOISTURE PAST A ROTARY SEAL IS DESCRIBED. THE MECHANISMS WERE DETERMINED AFTER EXTENSIVE SEARCH OF TECHNICAL LITERATURE AND CONSULTATIONS WITH PERSONS KNOWLEDGEABLE IN THE FIELD OF WATER VAPOR AND RELATED PHENOMENA. NONEXISTENCE OF SUITABLE TESTING FACILITIES REQUIRED THE DESIGN AND DEVELOPMENT OF SPECIAL EQUIPMENTS NECESSARY TO CONDUCT THE EXPERIMENT. THESE EQUIPMENTS INCLUDED SPECIAL MOISTURE SENSORS WITH ASSOCIATED INDICATING DEVICE AND SUITABLE SENSOR CALIBRATION MEANS; LEAKPROOF CHAMBERS FOR SIMULATING FIRE CONTROL INSTRUMENTS; MEANS FOR SIMULATING VARIOUS MODES OF ROTATION; AND A CONSTANT TEMPERATURE ENVIRONMENTAL CHAMBER. THE TESTING FACILITIES AND THEIR STATE OF COMPLETION AT THE END OF FY 1962 ARE DISCUSSED. RECOMMENDATIONS TO CONTINUE THE PROGRAM ARE MADE; COST AND TIME ESTIMATES FOR COMPLETION OF TESTING FACILITIES AND CARRYING OUT OF EXPERIMENT ARE PRESENTED. (AUTHOR) (U)

UNCLASSIFIED

DNC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-423 319

GENERAL ELECTRIC CO CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE.

(U)

DESCRIPTIVE NOTE: QUARTERLY REPT. NO. 5 PERIOD ENDING 15 JULY 63.

JUL 63 64P

CONTRACT: AF33 657 8469

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ROTARY SEALS, SHAFTS), (*SEALS (STOPPERS), SPACE ENVIRONMENTAL CONDITIONS), LIQUID METALS, RINGS, TESTS, TEST EQUIPMENT, GAS BEARINGS, DESIGN, LUBRICANTS, MATERIALS, CREEP, TENSILE PROPERTIES, STABILITY, STAINLESS STEEL, ELECTRON BEAMS, WELDING, POTASSIUM, HIGH-TEMPERATURE RESEARCH, PRESSURE, FLUID FLOW, IRON ALLOYS (U)

IDENTIFIERS: 1963, REX 49 ALLOY, 316 STAINLESS STEEL (U)

THE INTERFACE INSTABILITY OBSERVED DURING THE OPERATION OF DYNAMIC FLUID SEALS CONTINUED TO BE INVESTIGATE SEVERAL METHODS OF SUPPRESSING THE INSTABILITY LEAKAGE USING WATER AS THE SEAL FLUID HAVE BEEN DEVELOPED. THESE METHODS ARE NOT DEPENDENT ON CLOSE AXIAL CLEARANCES. METALLURGICAL DATA ON THE MATERIALS USED IN THE LIQUID METAL TEST RIG HAVE BEEN OBTAINED AND THE INFORMATION USED TO INSURE PROPER DESIGN OF THE EQUIPMENT. ADDITIONAL DATA ON THE WELDING AND HEAT TREATMENT OF THE REX 49 GAS BEARING SHAFT MATERIAL IS STILL BEING INVESTIGATED. ANALYSIS OF THE OPERATING CHARACTERISTICS OF THE ARGON GAS BEARING FOR THE LIQUID METAL TEST RIG HAS BEEN MADE WITH A PROGRAM ON THE 7090 COMPUTER. (AUTHOR) (U)

UNCLASSIFIED

DNC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-429 211

GENERAL ELECTRIC CO CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE.

(U)

DESCRIPTIVE NOTE: QUARTERLY REPT., NO. 6, 15 AUG-15
OCT 63.

OCT 63 73P

CONTRACT: AF33 657 8469

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ROTARY SEALS, SHAFTS), (*SEALS
(STOPPERS), SPACE ENVIRONMENTAL CONDITIONS), LIQUID
METALS, POTASSIUM, PRESSURE, ROTATION, HIGH-TEMPERATURE
RESEARCH, LIFE EXPECTANCY, MAINTENANCE, SEALING
COMPOUNDS, RINGS, GASKETS, LUBRICANTS, DESIGN, TESTS,
TEST METHODS, TEST EQUIPMENT, TEST FACILITIES, LAMINAR
FLOW, TURBULENCE, COUETTE FLOW, SPECIFICATIONS, FLUID
DYNAMIC PROPERTIES, SATELLITES (ARTIFICIAL) (U)
IDENTIFIERS: 1963, SNAP, LEAKAGE (U)

A THEORETICAL INVESTIGATION OF ROTATING FLUID RING
SEALS WAS COMPLETED. THE ANALYSIS PREDICTS THE
PERFORMANCE OF PLAIN ROTATING HOUSING AND ROTATING
DISK SEALS. THE EXPERIMENTAL INVESTIGATION OF THE
INTERFACE INSTABILITY ASSOCIATED WITH ROTATING FLUID
RING SEALS CONTINUED UTILIZING THE WATER SEAL TEST
RIG. THE TESTING PROVIDED ADDITIONAL DATA
CONCERNING THE EXTREME OPERATING RANGE OF THE
DYNAMIC ZERO LEAKAGE (DZL) SEALS WHICH WERE
DESIGNED TO ALLEVIATE THE INTERFACE INSTABILITY
PROBLEM. SO FAR, TWO SEAL CONCEPTS HAVE BEEN
DEVELOPED WHICH SUPPRESSED LIQUID LEAKAGE UP TO
SPEEDS OF 20,000 RPM. WATER SEAL TESTING WAS ALSO
PERFORMED ON THE ROTATING DISK SQUEEZE SEAL
CONFIGURATION TO OBTAIN ADDITIONAL TEST DATA FOR
CORRELATING THE SQUEEZE SEAL RESULTS WITH THEORETICAL
ANALYSIS. THE OPEN LOOP OF THE WATER SEAL RIG
FACILITY WAS CONVERTED TO A CLOSE LOOP SO THAT OTHER
FLUIDS SUCH AS OIL CAN BE EVALUATED AS SEALING
FLUIDS. SEAL TESTING FOR THE SNAP R PROJECT
USING DOW'S ET378 OIL WAS INITIATED.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-432 064

GENERAL ELECTRIC CO. CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE.

(U)

DESCRIPTIVE NOTE: QUARTERLY REPT. NO. 7, 16 OCT 63-15
JAN 64.

JAN 64 17P
CONTRACT: AF33 657 8469

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ROTARY SEALS, SHAFTS), (*SEALS
(STOPPERS), SPACE ENVIRONMENTAL CONDITIONS), HIGH
TEMPERATURE RESEARCH, LIQUID METALS, VAPORS, POTASSIUM,
PRESSURE, LIFE EXPECTANCY, LUBRICANTS, DESIGN,
CONFIGURATION, MAINTAINABILITY, SPECIFICATIONS, TEST
METHODS, TEST FACILITIES, TEST EQUIPMENT, COMPUTERS,
PROGRAMMING (COMPUTERS), PERFORMANCE (ENGINEERING),
FLUID DYNAMIC PROPERTIES, GASKETS
IDENTIFIERS: 1964, SNAP

(U)

(U)

THIS REPORTING PERIOD COVERS THE FOLLOWING: (1)
INVESTIGATING MODIFICATIONS TO THE DYNAMIC ZERO
LEAKAGE SEAL, (DZL SEAL); (2) SEAL TESTING
FOR THE SNAP-8 PROJECT USING ET-378 OIL; (3)
CHECKING OUT THE DZL SEAL DEVELOPED AT EVENDALE
FOR THE SNAP-8 PROJECT; (4) ADAPTING
COMPUTER FOR USE IN THE REDUCTION OF THE TEST DATA
OBTAINED DURING THE WATER SEAL TESTING; (5)
MANUFACTURING THE LIQUID METAL SEAL TEST RIG; AND
(6) MANUFACTURING OF THE LIQUID METAL SEAL TEST
FACILITY. (AUHTOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-601 338

GENERAL ELECTRIC CO CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE.

(U)

DESCRIPTIVE NOTE: QUARTERLY REPT. NO. 8.

APR 64 23P

CONTRACT: AF33 657 8469

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ROTARY SEALS, TEST FACILITIES), (*SEALS (STOPPERS), LIQUID METALS), SPACE ENVIRONMENTAL CONDITIONS, DRIVE SHAFTS, GAS BEARINGS, ROCKET COMPONENTS, SPACE PROPULSION

(U)

THE OBJECTIVE OF THE PROGRAM IS TO ACQUIRE THE TECHNIQUES FOR SEALING HIGH SPEED ROTATIVE SHAFTS UNDER THE OPERATING CONDITIONS OF HIGH TEMPERATURE LIQUID METALS AND VAPORS, THE NEARVACUUM ENVIRONMENTS OF SPACE AND TO PROVIDE LONG SEAL LIFE. THE LIQUID METAL SEAL TEST RIG WAS COMPLETELY MANUFACTURED, ASSEMBLED, AND INSTALLED IN THE FACILITY. THE LIQUID METAL SEAL TEST FACILITY CHECK-OUT CONTINUED. THE SYSTEMATIC APPROACH WAS ADOPTED WHICH WILL INSURE EXPEDITIOUS COMPLETION OF THIS CHECK-OUT. INSTRUMENTATION SET-UP AND CHECK-OUT FOR THE LIQUID METAL SEAL TEST RIG PROGRESSED THROUGHOUT THE QUARTER. DATA REDUCTION UTILIZING A COMPUTER PROGRAM WAS USED ON THE WATER SEAL TEST RESULTS. (AUTHOR)

(U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-603 655

GENERAL ELECTRIC CO CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE.

(U)

DESCRIPTIVE NOTE: QUARTERLY REPT. NO. 9.

JUL 64 53P

CONTRACT: AF33 657 8469

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SPACE PROPULSION, SEALS (STOPPERS)),
(*ROTARY SEALS, SPACE PROPULSION), (*SEALS (STOPPERS),
LIQUID METALS), SPACE ENVIRONMENTAL CONDITIONS, GAS
BEARINGS, THRUST BEARINGS, RESONANCE, ARGON, HIGH
TEMPERATURE RESEARCH, POTASSIUM, OIL SEALS, DRIVE
SHAFTS, TEST FACILITIES, CAPTIVE TESTS

(U)

THE OBJECTIVE OF THE PROGRAM IS TO ACQUIRE THE
TECHNIQUES FOR SEALING HIGH SPEED ROTATING SHAFTS
UNDER THE OPERATING CONDITIONS OF HIGH TEMPERATURE
LIQUID METALS AND VAPORS, THE VACUUM ENVIRONMENTS OF
SPACE AND TO PROVIDE LONG SEAL LIFE. THE LIQUID
METAL SEAL RIG WAS COMPLETELY ASSEMBLED FOR
PRELIMINARY CHECK-OUT TESTS. THE SUPPORTING
FACILITIES FOR THESE TESTS WERE INSTALLED AND
SATISFACTORILY OPERATED. ELECTROMAGNETIC SHAKE
TESTS OF THE INSTALLED SEAL RIG WERE CARRIED OUT.
STATIC TESTS OF THE EXTERNALLY PRESSURIZED ARGON
GAS BEARINGS WHICH CARRY THE SEAL SPINDLE WERE
CARRIED OUT FOR SEVERAL SUPPLY PRESSURES. DYNAMIC
GAS BEARING EVALUATION WAS COMPLETED. DYNAMIC SEAL
EVALUATION USING LIGHT TURBINE OIL WAS ALSO CARRIED
OUT. REDUCTION OF DATA OBTAINED DURING
EXPERIMENTAL EVALUATION (WATER) OF THE SQUEEZE
SEAL CONFIGURATIONS WAS COMPLETED.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-621 011

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

END SEALING OF A SHAFT,

(U)

AUG 65 5P ARINUSHKIN, L. S. IPOLINOVSKII,
A. YU. ;
REPT. NO. FTD-TT-65-773
MONITOR: TT , 65-63936

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF
RUSSIAN PATENT 134 986, PUB. 23 MAY 60, APPL. 667368/25,
2P.

DESCRIPTORS: (*SHAFTS, ROTARY SEALS), (*ROTARY
SEALS, SHAFTS), USSR, PATENTS, CENTRIFUGAL FIELDS,
SPRINGS, HERMETIC SEALS, GASKETS

(U)

THE OBJECT OF THE INVENTION IS THE END SEALING OF A
SHAFT IN THE FORM OF A RING TURNING TOGETHER WITH THE
SHAFT, THE RING SLIDING ON THE SMOOTH MOTIONLESS END
SURFACE TO WHICH IT IS PRESSED BY A SPRING, BELLOWS-
TYPE PACKING, AND SLOTTED CENTRIFUGAL PACKING, FORMED
BY THE RING GAP BETWEEN THE BOTTOM OF A CUP TURNING
TOGETHER WITH THE SHAFT AND THE MOTIONLESS END
SURFACE. FOR THE PURPOSE OF RELEASING THE SLIDING
SEALING AT HIGH ANGULAR VELOCITY THE JACKET OF THE
SLIDING RING HAS A CONICAL END SURFACE RESTING ON
BALLS WHICH PUSH IT OUT UNDER THE ACTION OF
CENTRIFUGAL FORCE. (AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-622 373

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

CLUTCH FOR TRANSMITTING ROTARY MOTION INTO AN AIR-TIGHT HOUSING,

(U)

SEP 65 6P TSEITLIN, N. I. IREPkin, M. V. ;
REPT. NO. FTD-TT-65-519
MONITOR: TT , 65-64155

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF
RUSSIAN PATENT 167 097, APPL. 836421/25-8, 17 MAY 63,
1P.

DESCRIPTORS: (*CLUTCHES, PRESSURE VESSELS),
(*ROTARY SEALS, PRESSURE VESSELS), ROTATION,
BEARINGS, PIPES, HERMETIC SEALS, PATENTS,
USSR

(U)

A CLUTCH IS DESCRIBED FOR THE TRANSMISSION OF
ROTARY MOTION INTO A HERMETICALLY SEALED CAVITY,
WHICH CONTAINS A DIAPHRAGM, A DRIVING AND A DRIVEN
HALF CLUTCH, WHICH HAS THE DISTINGUISHING FEATURE
THAT FOR THE PURPOSE OF ASSURING THE TRANSMISSION OF
ROTARY MOTION INTO A CAVITY OF SUPERHIGH PRESSURE A
BLANK WALL IS DESIGNED IN THE FORM OF A THIN-WALLED
TUBE CONSISTING OF CONCENTRIC SECTIONS OF THIN-WALLED
TUBES WITH VARYING OPTIMUM DIFFERENCES OF PRESSURE. (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-623 210

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

CENTRIFUGAL SEALING OF A ROTATING SHAFT,

(U)

OCT 65 6P RAZRAN, M. A. ITROYANKER, B. S. ;
REPT. NO. FTD-TT-65-1131
MONITOR: TT , 65-64428

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF
RUSSIAN PATENT 165 624, APPL. NO. 846604/25-B, 9 JUL 63,
2P.

DESCRIPTORS: (*ROTARY SEALS, SHAFTS), CENTRIFUGAL
FIELDS, PATENTS, USSR, DISKS, SEALS(STOPPERS),
CENTRIFUGAL PUMPS

(U)

THE OBJECT OF THE INVENTION IS THE CENTRIFUGAL
SEALING OF A ROTATING SHAFT, FOR INSTANCE, OF A
CENTRIFUGAL PUMP. TO PREVENT OVERFLOW OF THE
MEDIUM ALONG THE ROTATING SHAFT AND TO CREATE SELF-
SEALING, ELASTIC DISKS WITH EDGES BENT IN THE
DIRECTION OF THE MEDIUM OF INCREASED PRESSURE ARE
INSTALLED IN THE IMMOBILE SLEEVE FASTENED IN THE
HOUSING OF THE PUMP WHICH ARE PLACED BETWEEN THE HARD
WASHERS AND FASTENED ONTO THE ROTATING SHAFT.
(AUTHOR)

(1)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-706 841 11/1 20/4
WATERVLIET ARSENAL N Y BENET R AND E LABS

TWO-FLUID FLOWS IN FACE SEALS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
APR 70 158P ZWEIG, JOHN E. ;
PROJ: DA-1-T-061101-A-91-A
MONITOR: WVT 7014

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: DOCTORAL THESIS.

DESCRIPTORS: (*ROTARY SEALS, LAMINAR FLOW),
LEAKAGE (FLUID), LUBRICANTS, INTERFACES,
SHEAR STRESSES, DISKS, HYDRODYNAMICS,
THESES

(U)

IDENTIFIERS: *FACE SEALS

(U)

THE LAMINAR FLOW OF TWO DISSIMILAR FLUIDS IN AN
ALIGNED, PARALLEL SURFACE FACE SEAL IS STUDIED
ANALYTICALLY. IT IS ASSUMED THAT IN THE SPACE
BETWEEN THE SEAL FACES THERE ARE TWO DIFFERENT
CONSTANT PROPERTY FLUIDS SEPARATED BY AN IDENTIFIABLE
INTERFACE. VELOCITIES AND THE DOMINANT COMPONENTS
OF SHEAR STRESS ARE MATCHED ACROSS THIS INTERFACE.
THE GENERAL TWO-FLUID RESULTS ARE APPLIED TO
VARIOUS COMBINATIONS OF WATER, OIL, AND AIR IN THE
RESERVOIRS INSIDE AND OUTSIDE THE SEAL. PERFORMANCE
CHARACTERISTICS OF THESE COMBINATIONS ARE PRESENTED
GRAPHICALLY, ALONG WITH A DISCUSSION OF THE OPERATING
CONDITIONS FOR WHICH NO SOLUTIONS WERE OBTAINED.
(AUTHOR)

(U)

111

UNCLASSIFIED

/ZGMLS

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-717 881 13/9 13/10
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

MARINE THRUST BEARING, (U)

DEC 70 7P KUZNETSOV, S. A. ; LAPIN, B.
G. ;
REPT. NO. FTD-HT-23-752-70
PROJ: FTD-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF PATENT (USSR) 235
565 2P, 1969, BY D. KOOLBECK.

DESCRIPTORS: (*THRUST BEARINGS, DESIGN),
(*MARINE PROPULSION, THRUST BEARINGS), BALL
BEARINGS, LUBRICATION, COOLING, ROTARY SEALS,
PATENTS, USSR

(U)

IDENTIFIERS: TRANSLATIONS

(U)

THE MARINE SUPPORT BEARING CONSISTING OF A SET OF
RADIAL-SUPPORT BALL BEARINGS MOUNTED IN A HOUSING
WITH END CAPS WITH SEALS IS DISTINGUISHED BY THE FACT
THAT IN ORDER TO REDUCE WEIGHT AND DIMENSIONS OF THE
BEARING AND TO INCREASE THE COOLING SURFACE THE
BEARING HOUSING IS MADE WITH ANNULAR GROOVES FOR
SUPPLY OF OIL TO THE BALL BEARINGS, WHICH ARE LOCATED
AT THE JUNCTION OF TWO DETACHABLE RINGS OF BALL
BEARINGS; THE HOUSING ALSO HAS AN ANNULAR SLEEVE
SPACE FOR THE PASSAGE OF COOLANT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-726 444 13/9 20/11

NORTHWESTERN UNIV EVANSTON ILL DEPT OF MECHANICAL
ENGINEERING AND ASTRONAUTICAL SCIENCES

THERMOELASTIC INSTABILITY OF FRICTIONAL
CONTACTS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 APR-30 SEP 70,
JUN 71 41P BURTON, RALPH A. ; DOW,

THOMAS A. ;

REPT. NO. 5341-410

CONTRACT: N00014-67-A-0356-0013

PROJ: NR-249-017

UNCLASSIFIED REPORT

DESCRIPTORS: (*BEARINGS, FRICTION), INTERFACES,
THERMOELASTICITY, STABILITY, SLIDING CONTACTS,
ROTARY SEALS, HEAT TRANSFER, LUBRICATION

(U)

IDENTIFIERS: SLIDING CONTACT BEARINGS

(U)

THE REPORT IS A STUDY OF THE STABILITY OF
FRICTIONAL CONTACT OF ELASTIC SOLIDS. TO BE
SPECIFIC, THE PROBLEM IS TO DETERMINE WHEN SURFACE
PRESSURE OR TEMPERATURE DISTRIBUTIONS WILL BE DAMPED,
OR WHEN THEY WILL BE AMPLIFIED BY THE THERMAL,
FRICTIONAL AND ELASTIC INTERACTIONS OF THE SURFACES.
THIS EFFORT WILL SHED LIGHT ON THE BEHAVIOR OF
NUMEROUS LUBRICATED AND UNLUBRICATED SLIDING SYSTEMS
SUCH AS SEALS, BEARINGS, AND PISTON RINGS. IT
SHOULD LEAD TO DESIGN CRITERIA IN TERMS OF MATERIALS
AND OPERATING PARAMETERS. THE PRESENT REPORT IS
CONCERNED WITH TWO PHASES OF THE STUDY: A DISCRETE
MODEL OF SURFACE CONTACT, AND A CONTINUOUS THIN-BLADE
MODEL OF SURFACE CONTACT. THE FIRST SHEDS LIGHT ON
THE PROCESSES AT WORK, AND ANALYSIS OF IT LEADS TO A
'THERMAL VIBRATION' EQUATION WITH A DAMPING
COEFFICIENT WHICH MAY BE EITHER NEGATIVE OR POSITIVE
DEPENDING UPON THE SPECIFIC OPERATING CONDITIONS.
THE SECOND MODEL PROVIDES A MORE COMPLETE TREATMENT
OF THE THERMOELASTIC INTERACTIONS AT WORK IN
CONTINUOUS BODIES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-730 361 11/1 21/5
CURTISS-WRIGHT CORP WOOD-RIDGE N J

STATIC AND ROTATING AIR/GAS SEAL
EVALUATION.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 71 170P PALADINI, W. ;
REPT. NO. CW-WR-70-024F
CONTRACT: DAAJ02-70-C-0024
PROJ: DA-IG-162204-A-014
TASK: IG-162204-A-01409
MONITOR: USAAMRDL TR-71-28

UNCLASSIFIED REPORT

DESCRIPTORS: (*GAS SEALS, LEAKAGE(FLUID)),
(*GAS TURBINES, GAS SEALS), ROTARY SEALS, O-
RINGS, METAL SEALS, CENTRIFUGAL COMPRESSORS,
AXIAL-FLOW COMPRESSORS, COMPRESSOR PARTS,
MECHANICAL DRAWINGS
IDENTIFIERS: LABYRINTH SEALS

(U)
(U)

THE REPORT DESCRIBES AN EVALUATION OF THE LEAKAGE CHARACTERISTICS OF CURRENT GAS TURBINE ENGINE AIR/GAS SEALS AND SEALING SURFACES OF SMALL GAS TURBINE ENGINES. THE EVALUATION INCLUDED DEFINITION OF PROBABLE AIR/GAS LEAKAGE SOURCES AND PATHS IN AN ENGINE POSSESSING VARIABLE COMPRESSOR AND POWER TURBINE STATOR GEOMETRY, IDENTIFICATION OF SEALING CONCEPTS CURRENTLY IN USE, PREDICTION OF SEAL LEAKAGE IN THE SMALL ENGINE, RIG TESTING OF SEVERAL STATIC AND ROTATING SEALS, AND ANALYSIS OF THE EFFECT OF LEAKAGE ON SMALL ENGINE PERFORMANCE. THE ROTATING SHAFT SEAL TESTS WERE CONDUCTED ON A FIN-TO-FIN LABYRINTH SEAL AND A CARBON FACE CONTACT SEAL. THE CASING FLANGE SEAL TESTS WERE CONDUCTED ON METAL-TO-METAL SURFACES AND ON FOUR METAL SEALS FOR FLANGES. THE VARIABLE-GEOMETRY VANE TRUNNION SEAL TESTS WERE CONDUCTED ON A FLUOROCARBON BUSHING AND A METAL BUSHING FOR THE COMPRESSOR AND POWER TURBINE LOCATIONS, RESPECTIVELY. TESTING INCLUDED LEAKAGE CALIBRATIONS, AND THERMAL CYCLIC AND MECHANICAL CYCLIC OPERATION. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-730 723 11/1 20/4
TENNESSEE UNIV KNOXVILLE DEPT OF MECHANICAL AND AEROSPACE
ENGINEERING

TURBULENCE AND INERTIA EFFECTS IN THE ALIGNED
FACE SEAL.

(U)

DESCRIPTIVE NOTE: DOCTORAL THESIS,
AUG 71 149P WILHELM, LUTHER R. ;
REPT. NO. ME71-T57-12
CONTRACT: N00014-68-A-0144

UNCLASSIFIED REPORT

DESCRIPTORS: (*SEALS, HYDRODYNAMICS),
(*BEARINGS, SEALS), INCOMPRESSIBLE FLOW,
LAMINAR FLOW, TURBULENCE, DIFFERENCE EQUATIONS,
DIGITAL COMPUTERS, COMPUTER PROGRAMS,
LEAKAGE (FLUID), VISCOSITY, INERTIA,
THESES

(U)

IDENTIFIERS: *HYDRODYNAMIC SEALS, *RADIAL FACE
SEALS, ROTATING SEALS

(U)

USING AN ORDER OF MAGNITUDE ANALYSIS, THE GOVERNING
EQUATIONS ARE DERIVED FOR BOTH LAMINAR AND TURBULENT
FLOW IN AN ALIGNED FACE SEAL. THESE EQUATIONS
CONTAIN INERTIA TERMS WHICH HAVE NOT BEEN CONSIDERED
IN PREVIOUS ANALYSES. USING A DIGITAL COMPUTER, THE
EQUATIONS ARE SOLVED FOR INCOMPRESSIBLE FLOW TO FIND
THE LEAKAGE RATE. THE RESULTS ARE COMPARED WITH
CALCULATIONS USING A PURELY VISCOUS THEORY WITH NO
INERTIA TERMS AND ALSO WITH CALCULATIONS WHERE ONLY
THE CENTRIFUGAL INERTIA TERM IS CONSIDERED.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZGMLS

AD-732 021 11/1 20/4
TENNESSEE UNIV KNOXVILLE DEPT OF MECHANICAL AND AEROSPACE
ENGINEERING

BASIC RESEARCH IN DYNAMIC SEALING.

(U)

DESCRIPTIVE NOTE: ANNUAL SUMMARY REPT. 1 SEP 70-31 AUG
71,

OCT 71 62P FISHER, C. F. , JR. ; STAIR,
W. K. ; BROOKS, C. R. ; EDMONDSON, A. J. ;
BLALOCK, T. V. ;
REPT. NO. ME71-T57-13
CONTRACT: N00014-68-A-0144
PROJ: NR-097-377

UNCLASSIFIED REPORT

DESCRIPTORS: (*ROTARY SEALS, TURBULENCE),
MATHEMATICAL ANALYSIS, BOUNDARY LAYER, INERTIA,
DIFFUSIVITY, LUBRICATION, ELECTRON MICROSCOPY,
FILMS, MECHANICS

(U)

IDENTIFIERS: *MECHANICAL FACE SEALS, *FACE SEALS,
RADIAL FACE SEALS, *DYNAMIC SEALS

(U)

THE REPORT OUTLINES PROGRESS AND SIGNIFICANT
TECHNICAL INFORMATION OBTAINED DURING THE PERIOD
SEPTEMBER 1, 1970, THROUGH AUGUST 31, 1971, ON
BASIC RESEARCH IN DYNAMIC SEALING. PROGRESS ON
CONSTRUCTION OF A DYNAMIC TEST FACILITY FOR
MECHANICAL FACE SEALS IS REPORTED. RESULT. OF A
MATHEMATICAL STUDY, INCLUDING INERTIA EFFECTS, OF
TURBULENT FLOW IN THE SPACE BETWEEN THE FACES OF
MECHANICAL SEALS IS REPORTED. RESULTS OF
THEORETICAL AND EXPERIMENTAL STUDIES OF FLOW BETWEEN
POROUS DISCS IS REPORTED. (AUTHOR)

(U)

IX. RUBBER SEALS

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-256 689

GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF

THE EFFECTS OF REACTOR RADIATION ON ELASTOMERS AND
SEALANTS. III

(U)

APR 61 1V MORGAN, L.L.;
REPT. NO. NARF 60 37T
CONTRACT: AF33 600 38946

UNCLASSIFIED REPORT

DESCRIPTORS: *ELASTOMERS, *RADIATION DAMAGE, *RUBBER
ADHESIVES, *RUBBER SEALS, *SEALING COMPOUNDS, ADHESIVES,
GAMMA RAYS, MECHANICAL PROPERTIES, NEUTRON REACTIONS,
POLYMERS, STORAGE, SULFIDES, SYNTHETIC RUBBER, TENSILE
PROPERTIES (U)

FIFTEEN TYPES OF LIQUID POLYMER POLYSULFIDE
SEALANTS AND ONE CRUDE POLYSULFIDE SEALANT HAVE BEEN
IRRADIATED. INCLUDED WERE PRODUCTS RESEARCH
R-1201 AND PR-1422; MINNESOTA MINING EC-
1610, EC-1605, EC-1520, EC -!+, A D EC -*); C
H RCHILL 3C-1050; THIOKOL ST; AND SEVEN
LABORATORY FORMULATIONS FROM THE THIOKOL CHEMICAL
CORPORATION. TENSILE SPECIMENS OF EACH OF THE
SEALANTS WERE IRRADIATED IN AIR AND FUEL. SOME
PEEL SPECIMENS WERE IRRADIATED. IRRADIATIONS WERE
CONDUCTED TO A MAXIMUM DOSE OF 2.5×10 TO THE 10TH
POWER ERGS/GM GG (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-258 893

COAST GUARD WASHINGTON D C

TESTS OF PARKER RING SEAL FOR BUOY POCKETS (U)

JUN 61 1V
REPT. NO. 242

UNCLASSIFIED REPORT

DESCRIPTORS: *BUOYS, *GASKETS, *METAL SEALS, *RUBBER
GASKETS, *RUBBER SEALS, *SEALS (STOPPERS), ALUMINUM,
DESIGN, RINGS, TESTS (U)

TESTS WERE CONDUCTED TO DETERMINE THE SUITABILITY
OF A PARKER RING SEAL FOR USE AS A CLOSURE
GASKET IN BUOY POCKETS. THE GASKET ASSEMBLY
CONSISTS OF AN ALUMINUM FLAT RING HAVING A 24-INCH
I. D. AND 30-1/2-INCH O. D. WITH A NEOPRENE
RUBBER RING INSERT. THE RING SEAL WAS INSTALLED
IN A MOCK-UP BUOY POCKET AND AIR TESTED TO ONE
ATMOSPHERE. FIRE HOSE AND WATER SUBMERGENCE TESTS
WERE ALSO PERFORMED. IT WAS CONCLUDED THAT THE
PARKER RING SEAL GASKET WAS ADEQUATE FOR USE IN
COAST GUARD BUOY POCKETS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-260 920

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

DEVELOPMENT OF SEALS FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES (U)

1V FORD, R.D.?

UNCLASSIFIED REPORT

DESCRIPTORS: *PNEUMATIC SYSTEMS, *RUBBER SEALS, *SEALS
(STOPPERS), *SUBMARINES, AIR, COMPRESSED AIR,
EFFECTIVENESS, HIGH-PRESSURE RESEARCH, MATERIALS,
MECHANICAL PROPERTIES, PHYSICAL PROPERTIES, SYNTHETIC
RUBBER, TESTS (U)

STUDIES WERE CONDUCTED TO DEVELOP A FORMULATION FOR
RUBBER SEALS TO BE USED IN THE HIGH PRESSURE AIR
SYSTEMS OF FBM SUBMARINES. THE BEST STOCK WHICH
THE LABORATORY HAD DEVELOPED PREVIOUSLY FOR THIS
SERVICE WAS A VITON A-HV STOCK IDENTIFIED AS
COMPOUND A. AN OBJECTIONABLE FEATURE OF THIS
STOCK WAS ITS TENDENCY TO BACKRIND WHEN MOLDING. A
NEW VITON A-HV STOCK (377-89) WAS DEVELOPED
WHICH DOES NOT BACKRIND AND WHICH IS ALSO SUITABLE
FOR USE IN SEALS FOR HIGH PRESSURE GAS SERVICE.
FOUR SETS OF O-RINGS SUBMITTED BY THE PARKER
SEAL COMPANY WERE TESTED FOR RESISTANCE TO
SWELLING CAUSED BY RAPID RELEASE OF 5000 PSI AIR
PRESSURE. TWO OF THE SETS OF O-RINGS WERE FAIRLY
RESISTANT TO SWELLING, BUT WERE NOT EQUAL TO
COMPOUND A OR 377-89 IN THIS REGARD. O-RINGS
MADE BY LINEAR INCORPORATED AND CONFORMING TO
CLASSES A AND B OF SPECIFICATION MIL-P-
55168 WERE TESTED FOR SWELLING. BOTH THE
CLASS A (88 SHORE) AND CLASS B (68
SHORE) O-RINGS WERE SERIOUSLY SWOLLEN, AND THE
CLASS B O-RINGS EXHIBITED MANY SMALL BLISTERS
AFTER DECOMPRESSION. THE CLASS A O-RINGS WERE
CONSIDERED TO BE OF MARGINAL UTILITY IN HIGH
PRESSURE AIR SYSTEMS. THE CLASS B O-RINGS
WERE CONSIDERED TO BE UNSUITABLE FOR THIS PURPOSE.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-261 561

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

DEVELOPMENT OF SEALS FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES (U)

1V FORD,R.D.;MORRIS,R.E.)

UNCLASSIFIED REPORT

DESCRIPTORS: *ELASTOMERS, *RUBBER SEALS, *SEALS
(STOPPERS), *VULCANIZATES, ESTERS, FLUORIDES,
FLUOROCARBONS, HARDNESS, HIGH-PRESSURE COMPRESSORS,
HIGH-PRESSURE RESEARCH, LUBRICANTS, MATERIALS,
MECHANICAL PROPERTIES, NITRILE RUBBER, PETROLEUM,
PHOSPHATES, RUBBER, SUBMARINES, SYNTHETIC RUBBER,
TESTS (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-261 562

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

DEVELOPMENT OF SEALS FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES (U)

1V FORD, R.D.:

UNCLASSIFIED REPORT

DESCRIPTORS: *RUBBER SEALS, *SEALS (STOPPERS),
*SYNTHETIC RUBBER, CARBON BLACK, CARBOXYLIC ACIDS,
ELASTOMERS, ESTERS, HARDNESS, HIGH-PRESSURE COMPRESSORS,
HIGH-PRESSURE RESEARCH, LUBRICANTS, MATERIALS,
MECHANICAL PROPERTIES, NITRILE RUBBER, PETROLEUM,
PHOSPHATES, POLYMERS, RUBBER, SUBMARINES, TESTS,
VULCANIZATES (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZIML5 *

AD-261 564

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

DEVELOPMENT OF SEALS FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES (U)

IV

FORD, R.D. / MORRIS, R.F. I

UNCLASSIFIED REPORT

DESCRIPTORS: *RUBBER SEALS, *SEALS (STOPPERS), CARBON
BLACK, ELASTOMERS, ESTERS, FLUORIDES, FLUOROCARBONS,
HIGH-PRESSURE COMPRESSORS, HIGH-PRESSURE RESEARCH,
LUBRICANTS, MATERIALS, MECHANICAL PROPERTIES, NITRILE
RUBBER, PETROLEUM, PHOSPHATES, RUBBER, SILICONES,
SUBMARINES, SYNTHETIC RUBBER, TENSILE PROPERTIES, TESTS,
VULCANIZATES (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-267 121

MADE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

DEVELOPMENT OF SEALS FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES (U)

SEP 61 1V FORD, R.D.

UNCLASSIFIED REPORT

DESCRIPTORS: *PNEUMATIC SYSTEMS, *RUBBER SEALS, *SEALS
(STOPPERS), COMPRESSED AIR, EFFECTIVENESS, HIGH-PRESSURE
COMPRESSORS, HIGH-PRESSURE RESEARCH, MATERIALS,
MECHANICAL PROPERTIES, PHYSICAL PROPERTIES, SUBMARINES,
SYNTHETIC RUBBER (U)

THE LABORATORY WAS REQUESTED TO DEVELOP A
FORMULATION FOR RUBBER SEALS TO BE USED IN THE HIGH
PRESSURE AIR SYSTEMS OF FLEET-BALLISTIC-MISSILE
SUBMARINES. THE TWO BEST STOCKS REPORTED
PREVIOUSLY WERE HIGHLY RESISTANT TO BOTH THE
PETROLEUM AND PHOSPHATE-ESTER LUBRICANTS USED IN THE
AIR COMPRESSORS. SEALS MADE FROM BOTH STOCKS HAD
EXCELLENT RESISTANCE TO SWELLING BY HIGH PRESSURE
AIR. O-RINGS PREPARED FROM THE FIRMER STOCK, SHOWED
MODERATE BACKRINDING WHEN REMOVED FROM HOT MOLDS.
THE SECOND STOCK CURED WITHOUT BACKRINDING.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-270 746

WARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

SUITABILITY OF VITON B O-RINGS FOR USE IN 3000 PSI
HYDRAULIC SYSTEMS CONTAINING PETROLEUM BASE FLUID OR
CELLULUBE 220 (U)

NOV 61 1V FORD, R.D.1

UNCLASSIFIED REPORT

DESCRIPTORS: *HYDRAULIC SEALS, *HYDRAULIC SYSTEMS,
*RUBBER SEALS, HYDRAULIC FLUIDS, OIL SEALS, ORGANIC
COMPOUNDS, PETROLEUM, PHOSPHATES, POLYMERS, SYNTHETIC
RUBBER, TEST METHODS (U)

EFFORTS WERE MADE TO DEVELOP A PERFORMANCE TEST FOR
VITON O-RINGS TO BE USED IN 3000 PSI HYDRAULIC
SERVICE. THE SERVICE FLUID MAY BE EITHER PETROLEUM
BASE OR CELLULUBE 220. THE TEST APPARATUS
CONSISTED OF A PISTON WITH TWO O-RINGS WHICH
RECIPROCATES 100 TIMES/MIN IN A VERTICAL CYLINDER O
2.63-IN. INTERNAL DIAMETER. THE PISTON TRAVEL IS 1-
1/2 IN. THE CYLINDER IS HELD AT 160 F. TEFLON
BACK-UP RINGS ARE USED ON THE DOWNSTREAM SIDE OF THE
O-RINGS. THE PRESSURE-ON CYCLE LASTS FOR 9 MIN;
THE PRESSURE-OFF CYCLE LASTS FOR 1 MIN. LEAKAGE AT
BOTH ENDS OF THE PISTON IS COLLECTED. DIFFICULTY
WAS EXPERIENCED IN OBTAINING REPRODUCIBLE RESULTS
WITH THIS EQUIPMENT WHEN THE CRITERION WAS TIME
REQUIRED FOR A DEFINITE LEAKAGE (20 CC) TO OCCUR
AT 3000 PSI FLUID PRESSURE. THE TEST RESULTS SHOW
THAT VITON O-RINGS SEAL CELLULUBE 220
SATISFACTORILY UNDER THESE CONDITIONS AND ARE NOT
DAMAGED BY THIS TREATMENT. THE INVESTIGATION IS
BEING CONTINUED WIT THE CRITERION CHANGED T THE
NUMBER OF CYCLES BEFORE THE LEAKAGE IN A 24-HR PERIOD
EXCEEDS 15 CC FOR EITHER O-RING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-274 176

NATIONAL BUREAU OF STANDARDS BOULDER COLO CRYOGENIC
ENGINEERING LAB

ELASTOMERIC SEALS AND MATERIALS AT CRYOGENIC
TEMPERATURES

(U)

1V WEITZEL, D.H.; ROBBINS, R.F.;
REPT. NO. TOR62 31
MONITOR: ASD TOR62 31

UNCLASSIFIED REPORT

DESCRIPTORS: *ELASTOMERS, *RUBBER SEALS, *SEALS
(STOPPERS), ACRYLONITRILE POLYMERS, BUTADIENES,
CHLORIDES, CHLOROPRENES, CRYOGENICS, ETHYLENES, FLANGES,
FLUORIDES, HIGH-PRESSURE RESEARCH, MATERIALS, POLYMERS,
PROPENES (3 C), RINGS, RUBBER, SHEAR STRESSES,
SULFONATES, SYNTHETIC RUBBER, TENSILE PROPERTIES, TEST
METHODS, TESTS, THERMAL EXPANSION, THERMODYNAMICS,
UREIDO (N-C(O)-N), VINYL RADICAL (U)

AN INVESTIGATION WAS MADE OF ELASTOMERIC POLYMERS,
WITH PARTICULAR EMPHASIS ON THEIR USEFULNESS AS SEALS
AT CRYOGENIC TEMPERATURES. O-RING SEALS UTILIZING
VARIOUS FLANGE CONFIGURATIONS WERE EXTENSIVELY
EVALUATED AT TEMPERATURES BETWEEN 76 AND 300 K.
A SUPPORTING PROGRAM OF PROPERTY MEASUREMENTS
INCLUDES THERMAL EXPANSIVITIES, SHEAR AND COMPRESSION
MODULUS, DIFFERENTIAL THERMAL ANALYSIS, AND THE
FORCE-TEMPERATURE EFFECTS OF PRESTRESSED ELASTOMERS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHM15

AD-292 287

GENERAL DYNAMICS/FORT WORTH TEX

FAIRPRENE INTEGRAL FUEL TANK SEALING MATERIAL -
SWELLING CHARACTERISTICS OF,

(U)

NOV 58 30P MARK, H. ;
REPT. NO. MP-58-112
CONTRACT: AF33(657)-8926

UNCLASSIFIED REPORT

DESCRIPTORS: *AVIATION FUELS , *FUEL TANKS , *RUBBER SEALS
, *SEALING COMPOUNDS , BENZENES , SYNTHETIC RUBBER , TEST
METHODS , TOLUENES (M)

THE SWELLING CHARACTERISTICS OF FAIRPRENE 5570, A
NEOPRENE G. N. SYNTHETIC RUBBER IMMERSSED IN TEN
AVIATION FUELS, AND TEN TOLUOL (AROMATIC
HYDROCARBON) - AVIATION FUEL MIXTURES WERE MEASURED
BY VOLUME DISPLACEMENT, WEIGHT GAIN AND LENGTH
INCREASE METHODS. A RELATIONSHIP WAS ESTABLISHED
BETWEEN THESE METHODS. ANALINE POINTS OF THE
AVIATION FUELS WERE OBTAINED, AND A RELATIONSHIP
BETWEEN THE ANALINE POINT AND SWELLING WAS
ESTABLISHED. A FIELD TEST USING THE LENGTH
INCREASE OF A TEN INCH STRIP OF MATERIAL AS A MEASURE
OF SWELLING WAS DEvised. EQUILIBRIUM SWELLING AND
THE RATE OF SWELLING WERE FOUND TO INCREASE WITH
INCREASING AROMATIC CONTENT OF TEMPERATURE OF FUELS.
SWELLING INCREASED AS THE ANALINE POINT OF THE FUEL
WAS LOWERED, AND IN GENERAL THE LOGARITHM OF THE
EQUILIBRIUM SWELLING VARIED INVERSELY WITH THE
ANALINE POINT OF THE AVIATION FUEL. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-299 393

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

SURVEILLANCE TESTS OF MARK 15 POLARIS INTERTUBE
SEALS

(U)

MAR 63 1V JUSTL, O.J.; BARRETT, A.E.;

UNCLASSIFIED REPORT

DESCRIPTORS: *GUIDED MISSILE LAUNCHERS, *GUIDED
MISSILES (UNDERWATER-TO-SURFACE), *RUBBER SEALS,
DEFORMATION, DEGRADATION, FAILURE (MECHANICS),
PENETRATION, PIPES, PRESSURE, SEA WATER, SEALS
(STOPPERS)

(U)

IDENTIFIERS: POLARIS

(U)

SURVEILLANCE TESTS OF MARK 15 POLARIS INTERTUBE SEALS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-422 466

MONSANTO RESEARCH CORP DAYTON OHIO

EVALUATION OF ELASTOMERS AS O-RING SEALS FOR LIQUID
ROCKET FUEL AND OXIDIZER SYSTEMS. (U)

DESCRIPTIVE NOTE: REPT. FOR SEP 61-MAR 63,
SEP 63 69P BELLANCA, CARMEN L. ;SALYER,
IVAL O. ;HARRIS, JAY C. ;
CONTRACT: AF33 616 8483
PROJ: 7381
TASK: 738103
MONITOR: ASD TDR63 496

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RUBBER SEALS, COMPATIBILITY),
(*ELASTOMERS, SEALS (STOPPERS)), (*LIQUID ROCKET FUELS,
COMPATIBILITY), (*LIQUID ROCKET OXIDIZERS,
COMPATIBILITY), NITROGEN COMPOUNDS, TETROXIDES, CHLORINE
COMPOUNDS, FLUORIDES, HYDRAZINE, HYDRAZINE DERIVATIVES,
HALOCARBON PLASTICS, POLYETHYLENE PLASTICS, SILICONE
PLASTICS, HYDROGEN PEROXIDE, BUTYL RUBBER, DATA (U)
IDENTIFIERS: O-RINGS, 1963 (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-430 727

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

SEALS FOR 12,500 PSIG AIR SYSTEMS.

(U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 2,
FEB 64 16P BARRETT, A. E. ;
REPT. NO. 28-12
PROJ: SF013-13-01
TASK: 907

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RUBBER SEALS, PNEUMATIC DEVICES), (*SEALS
(STOPPERS), PNEUMATIC DEVICES), (*PNEUMATIC SYSTEMS,
RUBBER SEALS), TEST METHODS, HALOCARBON PLASTICS, AIR,
PRESSURE, DEFORMATION, AGING (MATERIALS), OXYGEN (U)
IDENTIFIERS: O RINGS, PNEUMATIC PRESSURE, SWELLING,
VITON B, 1964 (U)

THE ABILITY OF VITON B O-RING OF 90 SHORE
A HARDNESS TO SEAL 12,500 PSIG AIR PRESSURE WAS
EVALUATED UNDER DYNAMIC AND STATIC SIMULATED SERVICE
CONDITIONS USING SOLID TEFLON BACK-UP RINGS.
BOTH DYNAMIC AND STATIC SEALS SHOWED SMALL VOLUME
LEAKAGE AFTER TOTAL ELAPSED TIMES UNDER PRESSURE
RANGING FROM 35 TO 58 HOURS. THE O-RINGS SHOWED
NO DEFECTS OR EVIDENCE OF EXTRUSION AFTER TEST.
LEAKAGE MAY HAVE BEEN DUE TO SLOW RECOVERY OF THE
O-RINGS FROM COMPRESSION, MICROSCOPIC DEFECTS IN
THE METAL AND/OR RUBBER SURFACES, OR TO THE PRESENCE
OF SMALL PARTICLES OF COMPRESSED MOLYKOTE POWDER,
THE LUBRICANT USED ON THE O-RINGS. THE RATE OF
LEAKAGE WAS MUCH LESS THAN PREVIOUSLY REPORTED FOR
SIMILAR TESTS USING SPIRAL TEFLON BACK UP RINGS.
THE SWELLING OF THE O-RINGS CAUSED BY SUDDEN
RELEASE OF PRESSURE WAS LOW, FOR EXAMPLE: 1.2%
AFTER 1,000 PSIG PRESSURE AND 3.6% AFTER 12,500
PSIG PRESSURE. THE MEASUREMENTS WERE MADE ONE HOUR
AFTER PRESSURE RELEASE. THE PHYSICAL PROPERTIES OF
VITON B ORINGS WERE NOT GREATLY AFFECTED BY SIX
MONTHS EXPOSURE TO OXYGEN AT 60 F AND 1,750
PRESSURE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-601 033

MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF RUBBER LAB

DEVELOPMENT OF SEALS FOR ADVANCED-DESIGN POLARIS
LAUNCHING SYSTEM.

(U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1.
JUN 64 54P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*GUIDED MISSILE LAUNCHERS, SEALS
(STOPPERS)), (*RUBBER SEALS, GUIDED MISSILE LAUNCHERS),
(*SYNTHETIC RUBBER, RUBBER SEALS), GUIDED MISSILES
(UNDERWATERTO-SURFACE), GAS SEALS
IDENTIFIERS: POLARIS

(U)

(U)

SEALS MADE FROM NEOPRENE RUBBER WERE DEVELOPED FOR
USE IN THE LAUNCHING SYSTEM OF ADVANCED-DESIGN
POLARIS MISSILES. THE FUNCTION OF THE SEALS IS TO
CONTAIN THE GAS PRESSURE IN THE ANNULAR SPACE BETWEEN
THE MISSILE AND THE TUBE DURING LAUNCHING. TEN
DIFFERENT CROSS-SECTIONAL CONTOURS WERE STUDIED BY
TESTS ON REDUCED-SIZE SEALS, AND THE CONTOUR BEST
MEETING THE REQUIREMENTS FOR LOAD VERSUS CLEARANCE
AND SEALING ABILITY WAS SELECTED FOR LARGE SCALE
TESTING. SEALS OF THE SELECTED CONTOUR AND
NEOPRENE STOCK WERE MANUFACTURED AND INSTALLED IN THE
57 INCH-ID PEASHOOTER LAUNCH TUBE AT SAN
FRANCISCO NAVAL SHIPYARD. THE SEALS
FUNCTIONED VERY SATISFACTORILY DURING A TRIAL
LAUNCHING OF A DUMMY POLARIS MISSILE.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-610 189

GOODRICH (B F) AEROSPACE AND DEFENSE PRODUCTS AKRON
OHIO

PRESSURIZED BOW DOME OF A CABLE-REINFORCED RUBBER
CONSTRUCTION FOR USE WITH AN/SQS-26 SONAR. (U)

DESCRIPTIVE NOTE: INTERIM REPT. NO. 17, PHASE 1, 1 MAR
63-30 APR 64,

SEP 64 454P BERUS, W. J. ;

CONTRACT: NOBSR89483

PROJ: SS041 001

TASK: 8156

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: THIS REPT. COMPLETES PHASE I,
FEASIBILITY OF THE SUBJECT CONTRACT.

DESCRIPTORS: (*SONAR DOMES, RUBBER SEALS), (*RUBBER
SEALS, SONAR DOMES), (*ACOUSTIC EQUIPMENT, RUBBER
SEALS), RUBBER, SONAR EQUIPMENT, MANUFACTURING METHODS,
UNDERWATER SOUND EQUIPMENT, ANTIFOULING COATINGS,
PRESSURE VESSELS, CABLES (MECHANICAL), REINFORCING
MATERIALS, SHIP HULLS, MARINE ENGINEERING, FEASIBILITY
STUDIES (U)

IDENTIFIERS: ACOUSTIC WINDOWS, AN/SQS-26 (U)

THIS REPORT SUMMARIZES STUDIES OF THE FEASIBILITY
OF A PRESSURIZED, CABLE-REINFORCED, RUBBER ACOUSTIC
WINDOW FOR A SONAR BOW DOME. THE DISCUSSION
INCLUDES THEORETICAL APPROACHES AS WELL AS
DESCRIPTIONS OF THE FABRICATION AND TESTING OF
SAMPLES. DUE TO THE LARGE SIZE OF THE RUBBER
ACOUSTIC WINDOW, TOOLING IS A SPECIAL PROBLEM.
THIS REPORT INCLUDES RESULTS OF THE TOOLING
INVESTIGATION. SEVERAL OTHER ASSOCIATED STUDIES
WERE ALSO COMPLETED, AND THE RESULTS ARE PRESENTED
HEREIN. THESE INCLUDE AN ANTI-FOULING PAINT SYSTEM
FOR THE RUBBER ACOUSTIC WINDOW, AN INVESTIGATION OF
METHODS FOR TRANSPORTING THE WINDOW, AND A STUDY OF
DESIGN METHODS FOR ADAPTING A UNIVERSAL WINDOW TO
FOUR SIMILAR, BUT NOT IDENTICAL, SHIP'S HULLS. IT
WAS CONCLUDED THAT A RUBBER ACOUSTIC WINDOW IS
ENTIRELY FEASIBLE AND, IN FACT, SUPERIOR TO AN ALL-
STEEL DOME FROM THE STANDPOINT OF ACOUSTICAL
PERFORMANCE. THE PROTOTYPE WINDOW BEING DESIGNED
WILL MATE WITH EITHER THE DL-4, DL-5 OR DLG-26
SHIPS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-713 038 11/9 11/3
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

METHOD OF INCREASING THE WEAR RESISTANCE OF RUBBER
SEALS, (U)

AUG 70 4P ZAPRIVODA, A. I. ITENENBAUM,
M. M. ;
REPT. NO. FTD-HT-23-353-70
PROJ: FTD-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF PATENT (USSR) 227
807 1P, 11 DEC 65, BY L. THOMPSON.

DESCRIPTORS: (*RUBBER SEALS, WEAR RESISTANCE),
(*HALOCARBON PLASTICS, *LUBRICANTS), FRICTION,
USSR (U)

IDENTIFIERS: *SOLID LUBRICANTS,
*TETRAFLUOROETHYLENE RESINS, TRANSLATIONS (U)

THE SUBJECT OF THE INVENTION IS A METHOD OF
INCREASING THE WEAR RESISTANCE OF RUBBER SEALS, FOR
EXAMPLE, FOR SEALING SHAFTS, PISTONS, RODS, ETC., BY
APPLYING AN ANTIFRICTION COATING, IN PARTICULAR
TEFLON, TO THEIR SURFACES. THE ANTIFRICTION
TEFLON COATING IS MADE IN THE FORM OF A POROUS FILM
AND IS PRESSED ONTO A RUBBER BASE IN THE PROCESS OF
FORMING THE SEALING ELEMENT, WHEREUPON ADHESION OF
THE COATING TO THE BASE IS ACCOMPLISHED BY THE RUBBER
MASS FLOWING INTO THE PORES OF THE FILM AND BY
SUBSEQUENT VULCANIZATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-714 219 11/1 13/3 11/9 11/10
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG
MISS

INVESTIGATION OF NONMETALLIC WATERSTOPS.
REPORT 7. PREPARATION OF LABORATORY TEST
SAMPLES FROM FINISHED WATERSTOPS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
AUG 70 32P HOUSTON, BILLY J. ;
REPT. NO. AEWES-TR-6-546-7

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT 6, AD-666 203.

DESCRIPTORS: (*SEALS, TEST METHODS),
PREPARATION, RUBBER, POLYVINYL CHLORIDE,
PERFORMANCE(ENGINEERING)

(U)

IDENTIFIERS: *JOINT SEALERS

(U)

CORPS OF ENGINEERS SPECIFICATIONS FOR RUBBER
AND POLYVINYLCHLORIDE (PVC) WATERSTOPS REQUIRE THAT
THE MANUFACTURER FURNISH SHEET MATERIAL FROM THE SAME
LOT AS THE FINISHED WATERSTOP FOR ACCEPTANCE TESTING.
SINCE THE SHEET SAMPLES HAVE BEEN FOUND IN SOME
CASES TO HAVE PROPERTIES DIFFERENT FROM THE FINISHED
WATERSTOP, A STUDY WAS MADE TO DETERMINE THE
FEASIBILITY OF PREPARING ALL TEST SAMPLES IN THE
LABORATORY FROM THE FINISHED WATERSTOP. TWO
NATURAL RUBBER AND TWO PVC SPECIMENS WERE TESTED.
A MOLDING STUDY WAS ALSO CONDUCTED TO DETERMINE THE
OPTIMUM TEMPERATURE-TIME-PRESSURE COMBINATION FOR
PREPARING TEST SAMPLES. TEST RESULTS CONFIRMED THAT
SHEET SAMPLES SUBMITTED BY THE MANUFACTURER WERE NOT
ALWAYS REPRESENTATIVE OF THE FINISHED WATERSTOP AND
INDICATED THAT LABORATORY-PREPARED SPECIMENS WERE
MORE REPRESENTATIVE. THE TYPE OF EQUIPMENT TO BE
USED IN MOLDING, SLICING, AND GRINDING THE WATERSTOP
IS DESCRIBED IN THE REPORT. (AUTHOR)

(U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHML5

AD-718 226 13/3 11/1 11/10
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG
MISS

INVESTIGATION OF NONMETALLIC WATERSTOPS.
REPORT 5. WATER RETENTIVITY OF LABYRINTH-
SHAPED WATERSTOPS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JAN 71 26P HOUSTON, BILLY J. ;
REPT. NO. AEWES-TR-6-546-5

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPT. NO. 6, AD-666
203.

DESCRIPTORS: (*SEALS, ENVIRONMENTAL TESTS),
RUBBER, POLYVINYL CHLORIDE, CONCRETE,
DEGRADATION, SHEAR STRESSES,
FAILURE(MECHANICS), SEPARATION, HYDRAULIC
SYSTEMS, PRESSURE, JOINTS, EXPOSURE, SYNTHETIC
RUBBER, PERFORMANCE(ENGINEERING), CONFIGURATION
IDENTIFIERS: LABRINTH SHAPED WATERSTOPS, WATER
RETENTION

(U)

(U)

THIS IS THE FIFTH REPORT IN THE INVESTIGATION OF
NONMETALLIC WATERSTOPS SERIES, AND PRESENTS THE
RESULTS OF TESTS CONDUCTED TO EVALUATE THE WATER-
RETAINING PROPERTIES OF LABYRINTH-SHAPED WATERSTOPS
OF TWO SHAPES. THE ADVANTAGE OF LABYRINTH
WATERSTOPS OVER WATERSTOPS OF CONVENTIONAL SHAPE IS
THAT THE USE OF LABYRINTH WATERSTOPS DOES NOT REQUIRE
SPLITTING AND BRACING OF CONCRETE FORMS SO THAT THE
WATERSTOP CAN PROTRUDE FROM ONE PLACEMENT INTO THE
AREA WHERE THE NEXT PLACEMENT WILL COME. SINCE THE
CORPS OF ENGINEERS IS NOW ALLOWING THE USE OF
LABYRINTH WATERSTOPS UNDER CERTAIN CONDITIONS WHERE
LITTLE OR NO DIFFERENTIAL JOINT MOVEMENT IS EXPECTED,
THERE WAS A NEED TO KNOW HOW WELL LABYRINTH
WATERSTOPS INHIBIT THE PASSAGE OF WATER THROUGH A
JOINT. REPORT 4 OF THE SERIES INCLUDED THE RESULTS
OF WATER-RETENTIVITY TESTS OF CONVENTIONAL WATERSTOPS
OF FOUR SHAPES, AND THE RESULTS OF THE TESTS OF THE
LABYRINTH WATERSTOPS REPORTED HEREIN ARE COMPARED
WITH THOSE RESULTS OBTAINED EARLIER. THE RESULTS OF
THE TESTS AND COMPARISONS INDICATE THAT LABYRINTH
WATERSTOPS ARE AS EFFECTIVE IN RETAINING WATER AS
CONVENTIONALLY SHAPED WATERSTOPS WHEN THERE IS NO
JOINT SEPARATION. (AUTHOR)

(U)

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CORPORATE AUTHOR - MONITORING AGENCY

•AERONAUTICAL SYSTEMS DIV WRIGHT-
PATTERSON AFB OHIO

• • •
ASD-TDR62 31
ELASTOMERIC SEALS AND MATERIALS
AT CRYOGENIC TEMPERATURES
AD-274 176

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ASD-TDR63 496
EVALUATION OF ELASTOMERS AS O-
RING SEALS FOR LIQUID ROCKET FUEL
AND OXIDIZER SYSTEMS.
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RING SEALS FOR LIQUID ROCKET FUEL
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ASD-TR-70-52
CLOSURE TECHNIQUE FOR LARGE
BEARINGS ON AIRCRAFT WHEELS.
AD-729 679

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COMPONENT IMPROVEMENT PROGRAM
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AD-728 216

•AEROPROJECTS INC WEST CHESTER PA

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SYSTEMS ENGINEERING OPERATIONS

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EXPOSURE OF ELASTOMERS TO
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FULL PRESSURE PROTECTIVE SUIT
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INTRODUCTION OF LEADS INTO
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AD-410 018

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HEAT SHRINKABLE TUBING AS AN
INEXPENSIVE VACUUM SEAL.
AD-730 251

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A CONVENIENT AND RELIABLE
DEMOUNTABLE SEAL FOR LOW

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TEMPERATURE WORK.
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CONTAMINANT PARTICLES IN METAL-
TO-METAL CLOSURES.
AD-734 232

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RADIATION ON THE PHYSICAL
PROPERTIES OF TWO
RADIATION-RESISTANT O-RING
COMPOUNDS.
AD-612 404

BALEO PRODUCTS INC SCHEMECTADY N Y

NOTE-362
INSPECTION OF SH-1 CONTROL ROD
SEAL COMPONENTS
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AD-265 542

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AD-730 261

ARMY BALLISTIC MISSILE AGENCY
REDSTONE ARSENAL ALA

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LUBRICANTS, SEALANTS, IMMLADING
COMPOUNDS, PACKING AND G/ KETS FOR
USE IN ABMA MISSILE SYSTEM.
AD-466 035

ARMY COATING AND CHEMICAL LAB
ABERDEEN PROVING GROUND MD

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EFFECTS ON ELASTOMER COMPONENTS OF
DIESEL INJECTION SYSTEMS.
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1 CONTROL ROD SEAL FAILURE
AD-259 803

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INVESTIGATION OF NONMETALLIC
WATERSTOPS. REPORT 5. WATER
RETENTIVITY OF LABYRINTH-SHAPED
WATERSTOPS.
AD-718 226

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INVESTIGATION OF NONMETALLIC
WATERSTOPS. REPORT 7. PREPARATION
OF LABORATORY TEST SAMPLES FROM
FINISHED WATERSTOPS.
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RESPONSE: A NOTE AND CIRCUIT
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THEORETICAL INVESTIGATION OF
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CALIFORNIA UNIV LOS ANGELES DEPT OF
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A SIMPLE HIGH VOLTAGE VACUUM
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AD-693 739

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EVALUATION PROGRAMS CONDUCTED AT
CHANCE VUGHT CORPORATION
AD-278 888

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• • •

242
TESTS OF PARKER RING SEAL FOR
BUDY POCKETS
AD-258 843

CORNING GLASS WORKS N Y

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PILOT PRODUCTION OF GLASS
CRYSTAL HOLDERS (HC-1XH-21/U) HC-
1XM-31/U) HC-1XM-41/U)
AD-261 479

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PILOT PRODUCTION OF GLASS
CRYSTAL HOLDERS (HC-1XH-21/U) HC-
1XM-31/U) HC-1XM-41/U)
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SEAL EVALUATION,
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MEANS OF HERMETICALLY SEALING
PLASTIC,
(TT-66-61431)
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METALLURGICAL RESEARCH AND
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DEVICES,
AD-638 930

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TR-66-1
METALLURGICAL RESEARCH AND
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DEVICES,
AD-636 950

FLUOROCARBON CO PINE BROOK N J
TECHNICAL PRODUCTS DIV

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INVESTIGATION OF SEAL DESIGN
AND SEALING TECHNIQUES FOR KLL-F,
TEFLON AND MALON,
AD-428 594

FOREIGN TECHNOLOGY DIV BRIGHT-
PATTERSON AFB OHIO

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SELF-SEALING SCREW,
AD-724 992

• • •
FTD-HT-23-353-70
METHOD OF INCREASING THE WEAR
RESISTANCE OF RUBBER SEALS,
AD-713 038

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MARINE THRUST SEARING,
AD-717 881

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DEVICE FOR LUBRICATING
BEARINGS,
AD-718 180

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LUBRICATING COMPOSITION FOR
MERCURY WATER SEALS,
AD-721 032

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POSSIBLE USE OF MATERIALS BASED
ON POLYTETRAFLUORO ETHER FOR
PACKING DRILLING P S,
AD-720 928

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EXPERIMENTAL DETERMINATION OF
THE COEFFICIENT OF FRICTION DURING
THE CONTACT OF A SPHERE WITH A
CONE,

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FNA-GEN

AD-736 900

FTD-MT-66-38

A METHOD OF PRODUCING A HEAT-
RESISTANT HERMETIC SEALER BASED ON
FLUORINE-RUBBER.

AD-649 038

FTD-MT-67-17

METHOD OF PUMPING OF VACUUM
SYSTEMS.

AD-656 564

FTD-TT-65-519

CLUTCH FOR TRANSMITTING ROTARY
MOTION INTO AN AIR-TIGHT HOUSING.
(TT-65-64155)

AD-628 773

FTD-TT-65-773

END SEALING OF A SHAFT.

(TT-65-63936)

AD-621 011

FTD-TT-65-1131

CENTRIFUGAL SEALING OF A
ROTATING SHAFT.

(TT-65-64428)

AD-623 210

FRANKFORD ARSENAL PHILADELPHIA PA

FA-M63 1 2

DETERMINATION OF THE MECHANISMS
GOVERNING THE INFLOW OF MOISTURE
PAST A ROTARY SEAL.

AD-404 108

FA-MH M63 1 1

DETERMINATION OF THE MECHANISMS
GOVERNING THE INFLOW OF MOISTURE
PAST A ROTARY SEAL - THEORETICAL
MODEL.

AD-405 307

GENERAL CABLE CORP BAYONNE N J

PRESSURE DAMS IN COMMUNICATION
CABLES.

AD-678 688

GENERAL DYNAMICS/CONVAIR SAN DIEGO
CALIF

GDC-PH-351

TRAPPED RUBBER BLANKING AND
PIERCING PRODUCTION EVALUATION.

AD-677 734

NAEP 60 377

THE EFFECTS OF REACTOR
RADIATION ON ELASTOMERS AND
SEALANTS. III

AD-256 689

GENERAL DYNAMICS/FORT WORTH TEX

ERR FM 121

ENGINEERING RESEARCH - SEALING -
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OF

AD-284 074

FGY 1468

MATERIAL - THIOCOL ST RUBBER -
PREFABRICATED FILLETS - FOR
INTEGRAL FUEL TANK SEALING -
TESTING OF

AD-286 37

FGY 1505

MATERIAL - SEALANT - FIREWALL -
APPLICATION, PROCEDURES AND
PERFORMANCE OF

AD-286 230

FGY 1631

WING AND FUSELAGE - INTEGRAL
FUEL TANK SEALANTS - IMPROVED HIGH
TEMPERATURE (275 F) - PLM M.L.-5-
8802 - EVALUATION OF.

AD-286 232

FGY 1632

MATERIAL-ACCESS DOOR SEALANT-
SCREENING AND EVALUATION OF-

AD-286 410

FZE-176

THE EFFECTS OF REACTOR
RADIATION ON THE PHYSICAL
PROPERTIES OF T80

0-3
UNCLASSIFIED

GEN-KN1

UNCLASSIFIED

RADIATIONRESISTANT O-RING
COMPOUNDS.
(AFRL-TN-64-1331
AD-612 604

MP-58-112

BAINPRENE INTEGRAL FUEL TANK
SEALING MATERIAL - SWELLING
CHARACTERISTICS OF.
AD-292 287

GENERAL ELECTRIC CO CINCINNATI OHIO

DYNAMIC SHAFT SEALS IN SPACE
AD-283 365

DYNAMIC SHAFT SEALS IN SPACE
AD-249 700

DYNAMIC SHAFT SEALS IN SPACE.
AD-403 056

DYNAMIC SHAFT SEALS IN SPACE.
AD-423 319

DYNAMIC SHAFT SEALS IN SPACE.
AD-429 211

DYNAMIC SHAFT SEALS IN SPACE.
AD-432 064

DYNAMIC SHAFT SEALS IN SPACE.
AD-601 338

DYNAMIC SHAFT SEALS IN SPACE.
AD-603 655

GENERAL ELECTRIC CO ORSHBORN KY

3484 CERAMIC TRIODE, PRODUCTION
ENGINEERING MEASURE.
AD-429 473

GENERAL ELECTRIC CO SCHENECTADY N Y

THEORETICAL INVESTIGATION OF
OIL BACKSTREAMING THROUGH A VACUUM
TRAP.
(AEDC-TOR-63-1491
AD-410 925

GENERAL ELECTRIC CO WEST LYNN MASS
AIRCRAFT ENGINE GROUP

DEANING AND SEAL SCALABILITY
STUDY.
(USAAHROL-TN-71-27)
AD-729 329

GOODRICH (B F) AEROSPACE AND DEFENSE
PRODUCTS AKRON OHIO

PRESSURIZED BOW DOME OF A CABLE-
REINFORCED RUBBER CONSTRUCTION FOR
USE WITH AN/SOS-26 SONAR.
AD-610 189

HARRY DIAMOND LABS WASHINGTON D C

HDL-0032-1
ULTRASONIC WELDING OF PS117
COPPER THIMBLES.
AD-708 934

TH-64-28
SOLDER-GLASS SEALING OF
MICROWAVE ANTENNA WINDOWS.
AD-610 637

HOTPOINT INC CHICAGO ILL

DYNAMIC SHAFT SEALS IN SPACE
AD-400 255

IIT RESEARCH INST CHICAGO ILL

COMPOSITE INORGANIC RESILIENT
SEAL MATERIALS
AD-291 984

INTERAGENCY DATA EXCHANGE PROGRAM

IDEP-345.30.70.00-C6-01
THE THEORY OF PLANE ELASTIC
DEFORMATION APPLIED TO THE
COMPRESSION OF RUBBER SEALS.
AD-643 198

KNIGHTS (JAMES) CO SANDRICH ILL

GLASS HOLDER CRYSTAL UNITS
AD-266 244

U-4
UNCLASSIFIED

UNCLASSIFIED

MAR-MON

CRYSTAL UNITS TYPE CRXN-11/U
AD-283 498

SHARE ISLAND NAVAL SHIPYARD VALLEJO
CALIF. RUBBER LAB

SUITABILITY OF VITON B O-RINGS
FOR USE IN 3000 PSI HYDRAULIC
SYSTEMS CONTAINING PETROLEUM BASE
OR PHOSPHATE ESTER FLUIDS
AD-260 465

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-268 920

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 561

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 562

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 563

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 564

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-262 121

SUITABILITY OF VITON B O-RINGS
FOR USE IN 3000 PSI HYDRAULIC
SYSTEMS CONTAINING PETROLEUM BASE
FLUID OR CELLULOSE 220
AD-278 746

SURVEILLANCE TESTS OF MARK 15
POLARIS INTERTUBE SEALS
AD-299 343

PROPOSED MILITARY SPECIFICATION
GASKETS, MATCH SEAL O-RING, OIL-
RESISTANT RUBBER.
AD-424 301

DEVELOPMENT OF SEALS FOR
ADVANCED-DESIGN POLARIS LAUNCHING
SYSTEM.

AD-601 033

28-12

SEALS FOR 12,500 PSIG AIR
SYSTEMS.
AD-430 727

92-18

EFFECT OF SHELF AGING ON MIL-P-
5516 O-RINGS.
AD-430 759

MARTIN KARIETTA CORP DENVER COLO
DENVER DIV

CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED). VOLUME II.
SECTIONS D, E, F, G, H AND I.
AD-713 620

INGELPAR INC FALLS CHURCH VA

2000F POWER WIRE FOR AEROSPACE
ENVIRONMENT.
AD-602 144

MICHIGAN UNIV ANN ARBOR INST OF
SCIENCE AND TECHNOLOGY

2900 139 R

THE PHASE DIAGRAM FOR THE
BINARY SYSTEM CADMIUM-TELLURIUM
(NADREPS-6842)
AD-235 831

MIDLAND MFG CO INC KANSAS CITY KANS

CR XN44 U

MODERATE PRECISION GLASS
ENCLOSED CRYSTAL UNITS.
AD-413 654

MONSANTO RESEARCH CORP DAYTON OHIO

EVALUATION OF ELASTOMERS AS O-
RING SEALS FOR LIQUID ROCKET FUEL
AND OXIDIZER SYSTEMS.

0-7
UNCLASSIFIED

UNCLASSIFIED

NAT-NAV

(ASD-TOR63 496)
AD-422 466

EVALUATION OF ELASTOMERS AS O-
RING SEALS FOR LIQUID ROCKET FUEL
AND OXIDIZER SYSTEMS,
(ASD-TOR63 496 P2)
AD-609 240

NATIONAL BUREAU OF STANDARDS BOULDER
COLO CRYOGENIC ENGINEERING LAB

TDR62 31
ELASTOMERIC SEALS AND MATERIALS
AT CRYOGENIC TEMPERATURES
(ASD-TDR62 31)
AD-274 176

NATIONAL RESEARCH COUNCIL OF CANADA
OTTAWA (ONTARIO)

NRC-8841
COLD WELDED INDIUM LOW
TEMPERATURE WINDOW SEAL,
AD-633 296

NAVAL AIR ENGINEERING CENTER
PHILADELPHIA PA AERONAUTICAL
MATERIALS LAB

22090 61
QUALIFICATION TEST REPORT ON
DODGE CORK COMPANY'S 711-BN AND 100-
N GASKET MATERIALS TESTED IN
ACCORDANCE WITH MIL-G-4183,
AMENDMENT-4, GASKETS AND SHEET
GASKET MATERIAL; SYNTHETIC RUBBER
AND CORK COMPOSITION, CLASS I,
FIRM AND CLASS II, MEDIUM,
RESPECTIVE * OF 22 AUGUST 1947
AD-263 304

NAVAL APPLIED SCIENCE LAB BROOKLYN N
Y

6172 2
COMPOUNDING DEVELOPMENT OF
ELASTOMERS FOR GASKETS FOR
SUBMARINE HIGH PRESSURE AIR AND
OXYGEN SYSTEMS
AD-286 966

NAVAL CIVIL ENGINEERING LAB PORT
HUENEME CALIF

NCEL-TN-999
SEAL SYSTEMS IN HYDROSPACE,
PHASE I, MECHANICAL INTEGRITY OF
FLANGE SEAL SYSTEMS,
AD-843 582

NCEL-TN-1022
SEAL SYSTEMS IN HYDROSPACE,
PHASE II, CYCLIC LOADING OF FLANGE
AND MATCH SEAL SYSTEMS,
AD-684 080

NCEL-TN-1072
SEAL SYSTEMS IN HYDROSPACE,
PHASE III: EFFECTS OF LONG TERM
HYDROSPACE EXPOSURE ON SEAL SYSTEM
INTEGRITY, 189 DAYS AT 5,900 FEET,
AD-865 361

NCEL-TN-1160
PROTECTION OF DSRV SEAL SEAT
SURFACES EXPOSED TO CYCLIC PRESSURE
IN SEAWATER,
AD-731 356

NCEL-TR-686
STRUCTURAL DESIGN OF CONICAL
ACRYLIC VIEWPORTS,
AD-710 350

NAVAL INTELLIGENCE COMMAND ALEXANDRIA
VA TRANSLATION DIV

NIC-TRANS-3097
HERMETICALLY SEALED PUMPS IN
NUCLEAR PROPULSION PLANTS,
AD-713 267

NAVAL ORDNANCE LAB WHITE OAK MD

NAVORD-3893
AN EVALUATION OF THE
PERFORMANCE OF GAS CHECK GASKETS
FOR NAVAL PROJECTILES
AD-055 228

NAVAL RESEARCH LAB ORLANDO FLA
UNDERWATER SOUND REFERENCE DIV

0-8
UNCLASSIFIED

UNCLASSIFIED

NAV-ONE

• • •
NRL-7337
THE DESIGN OF DEEP-SUBMERGENCE
HYDROPHONES.
AD-729 643

NAVY MARINE ENGINEERING LAB
ANNAPOLIS MD

• • •
AN ANALYTICAL STUDY OF THIN
FLUID FILMS IN FACETYPE SHAFT
SEALS.
AD-460 741

• • •
NEL-56/66
SELF-LUBRICATED COMPOSITE
MATERIALS FOR HIGH-PRESSURE AIR
SEALS (FILAMENT-BOUND STRUCTURES).
AD-638 238

• • •
NEL-242/66
GALVANIC CORROSION BEHAVIOR OF
WEAR-RESISTANT MATERIALS FOR
MECHANICAL SHAFT SEALS.
AD-635 592

• • •
NEL-347/65
SELF-LUBRICATED SEALS
DEVELOPMENT FOR HIGH-PRESSURE, OIL-
FREE COMPRESSORS.
AD-627 230

NEW YORK UNIV N Y RESEARCH DIV
• • •
GASKETING MEDIA AT ULTRA-HIGH
PRESSURE.
(AFCLR-67-0592)
AD-666 860

• • •
SCIENTIFIC-1
GASKETING MEDIA AT ULTRA-HIGH
PRESSURE.
(AFCLR-67-0502)
AD-668 859

NEW YORK UNIV N Y SCHOOL OF
ENGINEERING AND SCIENCE
• • •
RESEARCH ON HIGH PRESSURE
MEDIA.
(AFCLR-66-3381)

AD-636 992

• NORTHROP SPACE LABS HAWTHORNE CALIF
• • •

NEL-67-177
PRESSURE SEALING CLOSURES FOR
FULL PRESSURE PROTECTIVE SUIT
ASSEMBLIES.
(AMRL-TR-67-59)
AD-658 204

• NORTHWESTERN UNIV EVANSTON ILL DEPT
OF MECHANICAL ENGINEERING AND
ASTRONAUTICAL SCIENCES
• • •

S341-410
THERMOELASTIC INSTABILITY OF
FRICTIONAL CONTACTS.
AD-726 444

• OKLAHOMA STATE UNIV STILLWATER
SCHOOL OF MECHANICAL ENGINEERING
• • •

A CONTINUATION OF THE STUDY IN
THE FIELD OF FLUID SEALS FOR HIGH-
SPEED ROTATING EQUIPMENT
AD-288 256

• • •
A CONTINUATION OF THE STUDY IN
THE FIELD OF FLUID SEALS FOR HIGH-
SPEED ROTATING EQUIPMENT
AD-288 540

• • •
A STUDY IN THE FIELD OF FLUID
SEALS FOR HIGH SPEED ROTATING
EQUIPMENT
AD-290 611

• OLIN MATTHEWSON CHEMICAL CORP NEW
HAVEN CONN CHEMICALS GROUP
• • •

DEVELOPMENT OF SOLVENT-
RESISTANT SEALANTS.
AD-656 315

• OREGON STATE UNIV CORVALLIS DEPT OF
CHEMISTRY
• • •

A SIMPLE VACUUM SEAL FOR NON-
CIRCULAR TUBES.
(AFOSR-67-2075)

0-9
UNCLASSIFIED

UNCLASSIFIED

FOR-ROH

AD-657 717

SPORTSMOUTH NAVAL SHIPYARD N H
MATERIALS TESTING LAB

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUB-MARINES
AD-254 218

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUBMARINES
AD-265 555

SPRATT AND WHITNEY AIRCRAFT WEST PALM
BEACH FLA FLORIDA RESEARCH AND
DEVELOPMENT CENTER

PWA-FR-9189
BEARING AND SEAL TECHNOLOGY
REVIEW.
(USAAMROL-TR-71-261)
AD-720 328

RADIO CORP OF AMERICA LANCASTER PA
INDUSTRIAL TUBE AND SEMICONDUCTOR
DIV

DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.
(RADC-TDR63 249)
AD-400 160

DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.
(RADC-TDR63 393)
AD-419 783

REPUBLIC AVIATION CORP FARMINGDALE N
Y

DESIGN AND DEVELOPMENT OF A
1000 P HYDRAULIC SYSTEM, PART III.
PHASE II INVESTIGATION
AD-259 940

RAC-682-626(268)
METALLIC BOSS SEAL EVALUATION
AND TEST PROGRAM.
AD-606 139

ROCK ISLAND ARSENAL ILL

INVESTIGATION OF HYDROPNEUMATIC
RECOIL MECHANISM PACKING SPRING
LOADS
AD-236 837

ROCKETDYNE CANOGA PARK CALIF

RS253
STUDY OF O-RING AGING
CHARACTERISTICS.
AD-426 505

R-8782
CONTAMINANT PARTICLES IN METAL-
TO-METAL CLOSURES.
(AFRPL-TR-71-112)
AD-734 232

ROME AIR DEVELOPMENT CENTER GRIFFISS
AFB NY

CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES
AD-275 082

CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES
AD-277 427

CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES
AD-285 106

RADC-TDR63 43
CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES.
AD-404 088

RADC-TDR63 249
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.
AD-404 160

RADC-TDR63 393
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.
AD-419 783

RADC-TR-60-236

UNCLASSIFIED

SAC-TRD

METAL-TO-CERAMIC SEAL
TECHNOLOGY STUDY
AD-248 535

• • •
RADC-TR-71-146
GROSS LEAK HERMETICITY TESTING
ANALYSIS,
AD-729 876

• SACLANT ASW RESEARCH CENTRE LA
SPEZIA (ITALY)
• • •
SACLANTCEN-TH-149
A CABLE GLAND FOR DEEP-SEA
OPERATION,
AD-870 494

• SPACE AND MISSILE SYSTEMS
ORGANIZATION LOS ANGELES AIR FORCE
STATION CALIF
• • •
SAMSO-TR-69-344
EXPOSURE OF ELASTOMERS TO
HYDRAZINE AND AIR, WATER VAPOR, OR
CARBON DIOXIDE,
AD-697 029

• SPERRY GYROSCOPE CO GREAT NECK N Y
• • •
METAL-TO-CERAMIC SEAL
TECHNOLOGY STUDY
(RADC-TR-60-236)
AD-248 535

• • •
CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES
AD-268 158

• • •
NAB250 8331
CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES,
(RADC-TR-63 43)
AD-404 088

• SPRINGFIELD ARMORY MASS
• • •
SA-TR-15 1104
DESIGN ANALYSIS OF BELLEVILLE
WASHER SPRINGS,
AD-431 961

• SYNTHETIC NICA CO WEST CALDWELL N J
• • •
ULTRA HIGH TEMPERATURE
DIELECTRIC EMBEDDING MATERIALS
AD-284 989

• TENNESSEE UNIV KNOXVILLE DEPT OF
MECHANICAL AND AEROSPACE
ENGINEERING

• • •
VISCO-TYPE GAS SEALING,
AD-699 291

• • •
ME49-T57-2
AN EXPERIMENTAL STUDY OF THE
VISCOSAL BEARING.
AD-686-175

• • •
ME49-T57-4
AN INVESTIGATION INTERFACE
STABILITY AND ITS RELATION TO GAS
INGESTION IN VISCOSALS,
AD-693 191

• • •
ME70-T57-10
A STUDY OF CONVECTIVE INERTIA
EFFECTS AND METHODS OF CONTROLLING
GAS INGESTION IN LARGE DIAMETER
VISCOSALS,
AD-709 160

• • •
ME71-T57-12
TURBULENCE AND INERTIA EFFECTS
IN THE ALIGNED FACE SEAL,
AD-730 723

• • •
ME71-T57-13
BASIC RESEARCH IN DYNAMIC
SEALING,
AD-732 021

• TEXAS TECH UNIV LUBBOCK DEPT OF
ELECTRICAL ENGINEERING

• • •
HEAT SHRINKABLE TUBING AS AN
INEXPENSIVE VACUUM SEAL,
(AFOSR-TR-71-2474)
AD-730 251

• TRW INC CLEVELAND OHIO
• • •

0-11
UNCLASSIFIED

UNCLASSIFIED

TUN-WH1

ER 4956

APPLIED RESEARCH ON A
HERMETICALLY-SEALED DRIVE COUPLING
FOR SPACE POWER TRANSMISSION
AD-282 710

STUNG-SOL ELECTRIC INC LIVINGSTON N J
CHATHAM ELECTRONICS DIV

PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES
AD-268 416

PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES
AD-272 338

PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES
AD-282 842

VOUGHT AERONAUTICS CO DALLAS TEX

VAC-2-32110/IR-2916
DEVELOPMENT OF FASTENER
COUNTERSINK CORROSION PROTECTION
SEALS.
AD-728 039

WATERVLIET ARSENAL N Y

RR6006
ANALYTIC DEVELOPMENT OF
DESIRABLE STRESS DISTRIBUTION
CHARACTERISTICS IN SEALING RINGS
LEADING TO RECOMMENDATION OF RING
NO. 1 FOR APPLICATION TO CLOSED
BREACH LAUNCHERS
AD-234 509

WVT-7101
SILICONE-ASBESTOS OBTURATOR
PADS FOR 175MM GUN, M113A 1, A
PRODUCT IMPROVEMENT.
AD-720 988

WVT-7107
A TECHNIQUE FOR THE ALTERNATE

FIRING AND CYCLING OF CANNON TUBES.
AD-721 898

WATERVLIET ARSENAL N Y BENET R AND E
LABS

WVT-7014
TWO-FLUID FLOWS IN FACE SEALS.
AD-706 841

WHITTAKER CORP SAN DIEGO CALIF
NARMCO RESEARCH AND DEVELOPMENT DIV

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM
AD-265 775

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM
AD-265 776

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM
AD-271 429

UNCLASSIFIED

SUBJECT INDEX

- ACOUSTIC EQUIPMENT
 - RUBBER SEALS
 - PRESSURIZED BOW DOME OF A CABLE-REINFORCED RUBBER CONSTRUCTION FOR USE WITH AN/SOS-26 SONAR.
- AD-610 109
- ADHESIVES
 - DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE SYSTEM.
- AD-265 775
- DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE SYSTEM.
- AD-265 776
- DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE SYSTEM.
- AD-271 429
- ALUMINUM ALLOYS
 - ABSTRACTS OF MATERIAL EVALUATION PROGRAMS CONDUCTED AT CHANCE VUGHT CORPORATION.
- AD-272 888
- ANTIFRICTION BEARINGS
 - LUBRICATION
 - DEVICE FOR LUBRICATING BEARINGS---TRANSLATION.
- AD-710 100
- OIL SEALS
 - BEARING AND SEAL SCALABILITY STUDY.
- AD-729 329
- AUXILIARY POWER PLANTS
 - A HERMETICALLY-SEALED COUPLING FOR A SPACE POWER TRANSMISSION FOR A 15 KW, 24,000 RPM POWER UNIT.
- AD-208 710
- AVIATION FUELS
 - PAIRPRENE INTEGRAL FUEL TANK SEALING MATERIAL - SWELLING CHARACTERISTICS OF.
- AD-297 207
- BEARINGS
 - FLUID FLOW
 - AN EXPERIMENTAL STUDY OF THE
- VISCOSEAL BEARING.
- AD-686 175
- FRICTION
 - THERMOELASTIC INSTABILITY OF FRICTIONAL CONTACTS.
- AD-726 444
- SEALS
 - AN INVESTIGATION INTERFACE STABILITY AND ITS RELATION TO GAS INGESTION IN VISCOSEALS.
- AD-693 191
- TURBULENCE AND INERTIA EFFECTS IN THE ALIGNED FACE SEAL.
- AD-730 723
- TURBOJET ENGINES
 - BEARING AND SEAL TECHNOLOGY REVIEW.
- AD-729 328
- BLACKBODY RADIATION
 - ABSTRACTS OF MATERIAL EVALUATION PROGRAMS CONDUCTED AT CHANCE VUGHT CORPORATION.
- AD-272 888
- BONDING
 - DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE SYSTEM.
- AD-265 775
- DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE SYSTEM.
- AD-265 776
- BREECH MECHANISMS
 - SEALS
 - SILICONE-ASBESTOS OBTURATOR PAD: FOR 175MM GUN, M113A 1, A PRODUCT IMPROVEMENT.
- AD-720 988
- BUOYS
 - TESTS OF PARKER RING SEAL FOR BUOY POCKETS.
- AD-258 893
- CADMIUM
 - THE PHASE DIAGRAM FOR THE BINARY SYSTEM CADMIUMTELLURIUM.

UNCLASSIFIED

CEN-COR

AD-233 831

•CENTRIFUGAL COMPRESSORS

SUPERSONIC WIND TUNNELS

COMPRESSOR AIR SEAL FAILURE,
SUPERSONIC WIND TUNNELS, ABERDEEN
PROVING GROUND, MARYLAND, 30 MAY
1969.*

AD-699 315

•CERAMIC COATINGS

ABSTRACTS OF MATERIAL EVALUATION
PROGRAMS CONDUCTED AT CHANCE VUGHT
CORPORATION.

AD-272 886

ULTRA HIGH TEMPERATURE
DIELECTRIC EMBEDDING
MATERIALS. A DEVITRIFIED GLASS
SEALING CEMENT WITH OPTIMUM
DEVITRIFICATION TEMPERATURE BETWEEN
350 C AND 400 C WAS DEVELOPED. THE
FLUIDIZED BED TECHNIQUE LED TO A
COATING THICKNESS WHICH WAS UNIFORM
TO 0.001 INCH.

AD-284 989

•CERAMIC MATERIALS

METAL-TO-CERAMIC SEAL TECHNOLOGY
STUDY.

AD-248 535

CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES.

AD-245 158

CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES.

AD-275 082

CERAMIC TO METAL SEALS FOR
HIGH-TEMPERATURE THERMIONIC
CONVERTERS. TEMPERATURE GOAL FOR
SEALS AND MATERIALS
DEVELOPED IN THE PROGRAM IS 2600
C.

AD-294 155

SEALS (STOPPERS)

DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.*

AD-419 783

•CLUTCHES

PRESSURE VESSELS

TRANSLATION OF RUSSIAN PATENT:
CLUTCH FOR TRANSMITTING ROTARY
MOTION INTO AN AIR-TIGHT HOUSING.
AD-622 373

•COMPOSITE MATERIALS

DEVELOPMENT OF COMPOSITE
MATERIALS FOR USE AS STATIC AND
DYNAMIC SEALS, CRYOGENIC TO
2000 F UP TO 600 PSI,
RECIPROCATING SHAFTS; SEALING
CABINS OF SPACESHIPS.
AD-291 984

FILAMENT WOUND CONSTRUCTION

SELF-LUBRICATED COMPOSITE
MATERIALS FOR HIGH-PRESSURE AIR
SEALS (FILAMENT-WOUND STRUCTURES).
AD-633 238

GASKETS

RESEARCH ON HIGH PRESSURE
MEDIA.*

AD-636 942

GASKETING MEDIA AT ULTRA-HIGH
PRESSURE.*

AD-665 860

•CONTROL RODS

PRELIMINARY INVESTIGATION OF SH-
1 CONTROL ROD SEAL FAILURE.*

AD-259 803

INSPECTION OF SH-1 CONTROL ROD
SEAL COMPONENTS.

AD-265 582

•COPPER

ULTRASONIC WELDING

ULTRASONIC WELDING OF PS117
COPPER THIMBLES.*

AD-738 934

•COPPER ALLOYS

CRYOGENICS

CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED), VOLUME II.
SECTIONS D, E, F, G, H AND I.*
AD-713 620

•CORROSION

METAL SEALS

D-2

UNCLASSIFIED

UNCLASSIFIED

CON-ELA

GALVANIC CORROSION BEHAVIOR OF
WEAR-RESISTANT MATERIALS FOR
MECHANICAL SHAFT SEALS.*
AD-635 592

STAINLESS STEEL
PROTECTION OF DSRV SEAL SEAT
SURFACES EXPOSED TO CYCLIC PRESSURE
IN SEAWATER.*
AD-731 356

CORROSION INHIBITION
PLASTIC COATINGS
DEVELOPMENT OF FASTENER
COUNTERSINK CORROSION PROTECTION
SEALS.*
AD-728 039

CRYOGENICS
HANDBOOKS
CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED). VOLUME II.
SECTIONS D, E, F, G, H AND I.*
AD-713 620

VACUUM SEALS
REPRINT: A CONVENIENT AND
RELIABLE DEMOUNTABLE SEAL FOR LOW
TEMPERATURE WORK.
AD-735 230

CRYSTAL HOLDERS
PILOT PRODUCTION OF GLASS
CRYSTAL HOLDERS (HC-1XH-21/U; HC-
1XH-31/U; HC-1XH-41/U)*
AD-261 179
GLASS HOLDER CRYSTAL UNITS*
AD-266 216
PILOT PRODUCTION OF GLASS
CRYSTAL HOLDERS (HC-1XH-21/U; HC-
1XH-31/U; HC-1XH-41/U)*
AD-271 910
MANUFACTURING CRYSTALS IN THE
FREQUENCY RANGE OF 1 TO 20 MC, TYPE
CX1XH-111/U AT THE RATE OF 300
PER 8-HR SHIFT, IN THE ALL-GLASS
HC-27/U TYPE HOLDER.
AD-289 490

DEEP SUBMERGENCE
UNDERWATER VEHICLES

PROTECTION OF DSRV SEAL SEAT
SURFACES EXPOSED TO CYCLIC PRESSURE
IN SEAWATER.*
AD-731 356

DEGASIFICATION
PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES.
AD-272 330

DIELECTRICS
SEALS
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.
AD-409 160

SEALS (STOPPERS)
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.*
AD-419 783

DIFFUSION PUMPS
OIL
THEORETICAL INVESTIGATION OF OIL
BACKSTREAMING THROUGH A VACUUM
TRAP.
AD-410 923

ELASTOMERS
THE EFFECTS OF REACTION RADIATION
ON ELASTOMERS AND SEALANTS. III-
10-256 689
DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.
AD-261 361
ELASTOMERIC SEALS AND MATERIALS
AT CRYOGENIC TEMPERATURES.
AD-279 176
DEVELOPMENT OF ELASTOMER
MATERIALS FOR GASKETS TO BE USED
IN SUBMARINE HIGH PRESSURE AIR
AND O₂ SYSTEMS.
AD-285 960

COMPATIBILITY
INVESTIGATING FUEL-ALCOHOL
EFFECTS ON ELASTOMER COMPONENTS OF
DIESEL INJECTION SYSTEMS.*
AD-465 374

D-3
UNCLASSIFIED

ELE-FIL

UNCLASSIFIED

ENVIRONMENTAL TESTS

EXPOSURE OF ELASTOMERS TO
HYDRAZINE AND AIR, WATER VAPOR, OR
CARBON DIOXIDE.*
AD-697 029

O-RINGS

ELASTOMERS AS O-RING SEALS FOR
LIQUID ROCKET FUEL AND OXIDIZER
SYSTEMS.
AD-608 240

RADIATION DAMAGE

EFFECTS OF REACTOR RADIATION ON
THE PHYSICAL PROPERTIES OF TWO
RADIATION-RESISTANT O-RING
COMPOUNDS.
AD-612 604

SEALS (STOPPERS)

EVALUATION OF ELASTOMERS AS O-
RING SEALS FOR LIQUID ROCKET FUEL
AND OXIDIZER SYSTEMS.*
AD-422 466

ELECTRIC CONNECTORS

HERMETIC SEALS
HERMETIC SEALS IN PLASTIC BODIED
CONNECTORS.*
AD-639 676

ELECTRIC WIRE

METAL SEALS
BRAZING STUDY TO PRODUCE
RELIABLE END SEALS FOR POWER WIRE
SYSTEMS.
AD-602 144

ELECTRON TUBES

METAL-TO-CERAMIC SEAL TECHNOLOGY
STUDY.*

AD-248 535
CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES.*
AD-266 158

CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES.*
AD-279 082

PROGRESS REPORT ON DESIGN OF
CERAMIC-METAL SEALS FOR HIGH POWER
TUBES, MANUFACTURING METHODS;

**PROCESSING; DESIGN; RELIABILITY
STUDIES,**

AD-277 427

CERAMIC-TO-METAL SEALS FOR HIGH
POWER TUBES. VARIABLES AFFECTING
SEAL TENSILE STRENGTHS. ACHIEVING
HIGHEST POSSIBLE RELIABILITY.
AD-285 106

•EMBEDDING SUBSTANCES

ULTRA HIGH TEMPERATURE
DIELECTRIC EMBEDDING
MATERIALS, A DEVITRIFIED GLASS
SEALING CEMENT WITH OPTIMUM
DEVITRIFICATION TEMPERATURE BETWEEN
550 C AND 600 C WAS DEVELOPED. THE
FLUIDIZED BED TECHNIQUE LED TO A
COATING THICKNESS WHICH WAS UNIFORM
TO +OR -10%.
AD-284 989

•ENCAPSULATION

ULTRA HIGH TEMPERATURE
DIELECTRIC EMBEDDING
MATERIALS, A DEVITRIFIED GLASS
SEALING CEMENT WITH OPTIMUM
DEVITRIFICATION TEMPERATURE BETWEEN
550 C AND 600 C WAS DEVELOPED. THE
FLUIDIZED BED TECHNIQUE LED TO A
COATING THICKNESS WHICH WAS UNIFORM
TO +OR -10%.
AD-284 989

•EPOXY PLASTICS

PLASTIC SEALS
DEVELOPMENT OF SOLVENT-RESISTANT
SEALANTS.*
AD-650 315

•FASTENINGS

PRESSURE SUITS
PRESSURE SEALING CLOSURES FOR
FULL PRESSURE PROTECTIVE SUIT
ASSEMBLIES.*
AD-658 204

•FILAMENT WOUND CONSTRUCTION

COMPOSITE MATERIALS
SELF-LUBRICATED COMPOSITE
MATERIALS FOR HIGH-PRESSURE AIR
SEALS (FILAMENT-WOUND STRUCTURES).

D-4

UNCLASSIFIED

UNCLASSIFIED

COR-ELA

GALVANIC CORROSION BEHAVIOR OF
WEAR-RESISTANT MATERIALS FOR
MECHANICAL SHAFT SEALS.*
AD-635 592

STAINLESS STEEL
PROTECTION OF DSRV SEAL SEAT
SURFACES EXPOSED TO CYCLIC PRESSURE
IN SEAWATER.*
AD-731 356

CORROSION INHIBITION
PLASTIC COATINGS
DEVELOPMENT OF FASTENER
COUNTERSINK CORROSION PROTECTION
SEALS.*
AD-728 037

CRYOGENICS
HANDBOOKS
CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED). VOLUME 1,
SECTIONS D, E, F, G, H AND I.*
AD-713 620

VACUUM SEALS
REPRINT: A CONVENIENT AND
RELIABLE DEMOUNTABLE SEAL FOR LOW
TEMPERATURE WORK.
AD-735 230

CRYSTAL HOLDERS
PILOT PRODUCTION OF GLASS
CRYSTAL HOLDERS (HC-(XM-2)/U; HC-
(XM-3)/U; HC-(XM-4)/U)*
AD-261 974
GLASS HOLDER CRYSTAL UNITS*
AD-268 246
PILOT PRODUCTION OF GLASS
CRYSTAL HOLDERS (HC-(XM-2)/U; HC-
(XM-3)/U; HC-(XM-4)/U)*
AD-271 918
MANUFACTURING CRYSTALS IN THE
FREQUENCY RANGE OF 1 TO 20 MC, TYPE
CR(XM-11)/U AT THE RATE OF 500
PER 8-HR SHIFT, IN THE ALL-GLASS
HC-27/U TYPE HOLDER,
AD-283 496

DEEP SUBMERGENCE
UNDERWATER VEHICLES

PROTECTION OF DSRV SEAL SEAT
SURFACES EXPOSED TO CYCLIC PRESSURE
IN SEAWATER.*
AD-731 356

DEGASIFICATION
PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES*
AD-272 338

DIELECTRICS
SEALS
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY,
AD-409 140

SEALS (STOPPENS)
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY,*
AD-419 783

DIFFUSION PUMPS
OILS
THEORETICAL INVESTIGATION OF OIL
BACKSTREAMING THROUGH A VACUUM
TRAP,
AD-410 925

ELASTOMERS
THE EFFECTS OF REACTOR RADIATION
ON ELASTOMERS AND SEALANTS, III*
AD-256 689
DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES*
AD-261 561
ELASTOMERIC SEALS AND MATERIALS
AT CRYOGENIC TEMPERATURES*
AD-274 176
DEVELOPMENT OF ELASTOMER
MATERIALS FOR GASKETS TO BE USED
IN SUBMARINE HIGH PRESSURE AIR
AND O₂ SYSTEMS,
AD-285 966

COMPATIBILITY
INVESTIGATING FUEL-ALCOHOL
EFFECTS ON ELASTOMER COMPONENTS OF
DIESEL INJECTOR SYSTEMS,*
AD-663 374

D-3
UNCLASSIFIED

UNCLASSIFIED

FIL-GAS

AD-633 238

FILMS

HYDRAULIC SEALS

AN ANALYTICAL STUDY OF THIN
FLUID FILMS IN FACE-TYPE SHAFT
SEALS.

AD-960 741

FIRE CONTROL SYSTEM COMPONENTS
MECHANISMS GOVERNING FLOW OF
WATER AND WATER VAPOR THROUGH
ROTARY SEALS; EFFECTIVE MOISTURE
BARRIERS FOR FIRE CONTROL
INSTRUMENTS.

AD-408 307

**FLUID FLOW
THEORY**

THEORETICAL INVESTIGATION OF OIL
BACKSTREAMING THROUGH A VACUUM
TRAP.

AD-410 925

**FUEL INJECTORS
O-RINGS**

INVESTIGATING FUEL-ALCOHOL
EFFECTS ON ELASTOMER COMPONENTS OF
DIESEL INJECTOR SYSTEMS.

AD-666 374

FUEL SEALS

SEALANT FOR CLOSING JOGGLE
CRACKS AND VOIDS IN THE CLOSURE
RIB FIREWALLS ON THE B-58 TESTED
FOR HIGH TEMPERATURE, VIBRATION,
AND FLAME RESISTANCE.

AD-288 230

SEALANTS EVALUATED FOR THE
PROPOSED HIGH TEMPERATURE (275
F) SEALANT SPECIFICATION
(MIL-S-8802), HIGH
TEMPERATURE RESISTANCE, ADHESION,
THERMAL SHOCK AND COMPATIBILITY
TESTS.

AD-288 232

DETERMINATION OF THE PHYSICAL
PROPERTIES OF THIOKOL 'ST'
SYNTHETIC RUBBER PREFABRICATED
FILLET'S USED FOR SEALING THE
INTERNAL FUEL TANKS ON B-58

AIRPLANES.

AD-286 237

FUEL SEALING SYSTEMS FOR SPACE
AND RE-ENTRY OPERATIONS. A
SILVER IMPREGNATED METAL-
FIBER COMPOSITE SEAL WAS TESTED BY
INSTALLING THE SEAL BETWEEN
THE FAYING SURFACES OF A STEEL
TANK AND APPLYING INTERNAL AIR
PRESSURES.

AD-289 074

LIQUID ROCKET FUELS

ELASTOMERS AS O-RING SEALS FOR
LIQUID ROCKET FUEL AND OXIDIZER
SYSTEMS.

AD-407 240

FUEL TANKS

MATERIAL-ACCESS DOOR SEALANT-
SCREENING AND EVALUATION OF-

AD-283 410

SEALANTS EVALUATED FOR THE
PROPOSED HIGH TEMPERATURE (275
F) SEALANT SPECIFICATION
(MIL-S-8802), HIGH
TEMPERATURE RESISTANCE, ADHESION,
THERMAL SHOCK AND COMPATIBILITY
TESTS.

AD-286 232

FUEL SEALING SYSTEMS FOR SPACE
AND RE-ENTRY OPERATIONS. A
SILVER IMPREGNATED METAL-
FIBER COMPOSITE SEAL WAS TESTED BY
INSTALLING THE SEAL BETWEEN
THE FAYING SURFACES OF A STEEL
TANK AND APPLYING INTERNAL AIR
PRESSURES.

AD-289 074

FAIRPRENE INTEGRAL FUEL TANK
SEALING MATERIAL - SWELLING
CHARACTERISTICS OF.

AD-292 287

FUZE FUNCTIONING ELEMENTS

COPPER

ULTRASONIC WELDING OF PS117
COPPER THIMBLES.

AD-708 934

GAS SEALS

D-5
UNCLASSIFIED

UNCLASSIFIED

GAS-GAS

ANALYTIC DEVELOPMENT OF
DESIRABLE STRESS DISTRIBUTION
CHARACTERISTICS IN SEALING RINGS
LEADING TO RECOMMENDATION OF RING
NO. 3 FOR APPLICATION TO CLOSED
BREECH LAUNCHERS.

AD-239 509

FAILURE (MECHANICS)

COMPRESSOR AIR SEAL FAILURE,
SUPERSONIC WIND TUNNELS, ABERDEEN
PROVING GROUND, MARYLAND, 20 MAY
1969.

AD-699 315

LEAKAGE (FLUID)

STATIC AND ROTATING AIR/GAS SEAL
EVALUATION.

AD-730 361

PERFORMANCE (ENGINEERING)

REPRINT: VISCO-TYPE GAS
SEALING.

AD-699 291

PRESSURE SUITS

PRESSURE SEALING CLOSURES FOR
FULL PRESSURE PROTECTIVE SUIT
ASSEMBLIES.

AD-658 204

GAS TURBINES

GAS SEALS

STATIC AND ROTATING AIR/GAS SEAL
EVALUATION.

AD-730 361

GASKETS

AN EVALUATION OF THE PERFORMANCE
OF GAS CHECK GASKETS FOR NAVAL
PROJECTILES.

AD-059 228

INVESTIGATION OF HYDRO-PNEUMATIC
RECOIL MECHANISM PACKING SPRING
LOADS.

AD-236 837

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUB-MARINES.

AD-256 218

TESTS OF PARKER RING SEAL FOR

BODY POCKETS

AD-258 893

QUALIFICATION TEST REPORT ON
DODGE CORK COMPANY'S 711-BN AND 100-
N GASKET MATERIALS TESTED IN
ACCORDANCE WITH MIL-G-6183,
AMENDMENT-4, GASKETS AND SHEET
GASKET MATERIAL; SYNTHETIC RUBBER
AND CORK COMPOSITION, CLASS I,
FIRM; AND CLASS II, MEDIUM,
RESPECTIVELY OF 22 AUGUST 1947.

AD-263 306

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUBMARINES.

AD-265 555

DEVELOPMENT OF ELASTOMER
MATERIALS FOR GASKETS TO BE USED
IN SUBMARINE HIGH PRESSURE AIR
AND O2 SYSTEMS.

AD-285 966

THE DESIGN, FABRICATION, AND
TESTING OF A FLUID SEAL TEST
FACILITY.

AD-288 256

AGING (MATERIALS)

STUDY OF O-RINGS AGING
CHARACTERISTICS.

AD-426 505

COMPATIBILITY

LUBRICANTS, SEALANTS, THREADING
COMPOUNDS, PACKING AND GASKETS FOR
USE IN ABMA MISSILE SYSTEMS.

AD-466 035

COMPOSITE MATERIALS

GASKETING MEDIA AT ULTRA-HIGH
PRESSURE.

AD-665 859

GASKETING MEDIA AT ULTRA-HIGH
PRESSURE.

AD-665 860

EXPOSURE

SEAL SYSTEMS IN HYDROSPACE,
PHASE I, MECHANICAL INTEGRITY OF
FLANGE SEAL SYSTEMS.

AD-843 582

D-6

UNCLASSIFIED

UNCLASSIFIED

GLA-GUI

LOCKING FASTENER DEVICES
DESIGN ANALYSIS OF BELLEVILLE
WASHER SPRINGS FOR ENERGY STORAGE,
AD-931 961

MATERIALS
RESEARCH ON HIGH PRESSURE
MEDIA,
AD-636 942

MILITARY REQUIREMENTS
PROPOSED MILITARY SPECIFICATION
GASKETS, HATCH SEAL O-RING, OIL-
RESISTANT RUBBER,
AD-424 301

STORAGE
SHELF LIFE OF O-RINGS STORED AT
70-80 F UNDER VARIOUS CONDITIONS OF
EXPOSURE TO LIGHT AND AIR,
AD-430 759

GLASS SEALS
PILOT PRODUCTION OF GLASS
CRYSTAL HOLDERS (HC-1XN-2)/U; HC-
(1XN-3)/U; HC-(1XN-4)/U,
AD-241 979
GLASS HOLDER CRYSTAL UNITS,
AD-266 246
PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES,
AD-268 416
PILOT PRODUCTION OF GLASS
CRYSTAL HOLDERS (HC-1XN-2)/U; HC-
(1XN-3)/U; HC-(1XN-4)/U,
AD-271 918
PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES,
AD-272 338
PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES,
AD-282 892
MANUFACTURING CRYSTALS IN THE
FREQUENCY RANGE OF 1 TO 20 MC, TYPE
CR1XN-11)/U AT THE RATE OF 500
PER 8-HR SHIFT, IN THE ALL-GLASS
HC-27/U TYPE HOLDER,
AD-283 498

ULTRA HIGH TEMPERATURE
DIELECTRIC EMBEDDING
MATERIALS, A DEVITRIFIED GLASS
SEALING CEMENT WITH OPTIMUM
DEVITRIFICATION TEMPERATURE BETWEEN
550 C AND 600 C WAS DEVELOPED. THE
FLUIDIZED BED TECHNIQUE LED TO A
COATING THICKNESS WHICH WAS UNIFORM
TO ± 0.01 IN.

AD-284 989
CERAMIC TO METAL SEALS FOR
HIGH-TEMPERATURE THERMIONIC
CONVERTERS, TEMPERATURE GOAL FOR
SEALS AND MATERIALS
DEVELOPED IN THE PROGRAM IS 2000
C,
AD-294 155

INDIUM.
REPRINT: COLD WELDED INDIUM LOW
TEMPERATURE WINDOW SEAL,
AD-633 296

MANUFACTURING METHODS
PRODUCING A SEMI-PRECISION
QUARTZ CRYSTAL UNIT IN AN EVACUATED
GLASS HOLDER, DESIGN OF 15-MC
RESONATORS,
AD-413 654

WAVEGUIDE WINDOWS
SOLDER-GLASS SEALING OF
MICROWAVE ANTENNA WINDOWS,
AD-610 837

GLASS TEXTILES
ABSTRACTS OF MATERIAL EVALUATION
PROGRAMS CONDUCTED AT CHANCE VUGHT
CORPORATION,
AD-272 888

GLUM DISCHARGES
RADIOFREQUENCY
REPRINT: A SIMPLE HIGH VOLTAGE
VACUUM SEAL,
AD-695 739

GUIDED MISSILE LAUNCHERS
SURVEILLANCE TESTS OF MARK 15
POLARIS INTERTUBE SEALS,
AD-299 393

D-7
UNCLASSIFIED

UNCLASSIFIED

GUI-HIG

SEALS (STOPPERS)

DEVELOPMENT OF SEALS FOR
ADVANCED-DESIGN POLARIS LAUNCHING
SYSTEM,
AD-601 033

GUIDED MISSILES (UNDERWATER-TO-SURFACE)

SURVEILLANCE TESTS OF MARK 15
POLARIS INTERTUBE SEALS,
AD-294 393

GUN BARRELS

FATIGUE (MECHANICS)
A TECHNIQUE FOR THE ALTERNATE
FIRING AND CYCLING OF CANNON
TUBES,
AD-721 894

GUNS

ANALYTIC DEVELOPMENT OF
DESIRABLE STRESS DISTRIBUTION
CHARACTERISTICS IN SEALING RINGS
LEADING TO RECOMMENDATION OF RING
NO. 3 FOR APPLICATION TO CLOSED
BREECH LAUNCHERS,
AD-239 509

HALOCARBON PLASTICS

FLUORINE COMPOUNDS
SEAL DESIGN AND SEALING
TECHNIQUES FOR KEL-F, TEFLON AND
HALONI SPIN SEALING,
AD-428 599

LUBRICANTS

METHOD OF INCREASING THE WEAR
RESISTANCE OF RUBBER SEALS--
TRANSLATION,
AD-713 038

PLASTIC SEALS

POSSIBLE USE OF MATERIALS BASED
ON POLYTETRAFLUOROETHYLENE FOR
PACKING DRILLING PUMPS--
TRANSLATION,
AD-720 928

HANDBOOKS

CRYOGENICS
CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED), VOLUME 11,

SECTIONS D, E, F, G, H AND I,
AD-713 420

HEAT-RESISTANT PLASTICS

SEALANTS FOR CLOSING JOGGLE
CRACKS AND VOIDS IN THE CLOSURE
RIB FIREWALLS ON THE B-58 TESTED
FOR HIGH TEMPERATURE, VIBRATION,
AND FLAME RESISTANCE,
AD-286 230

HERMETIC SEALS

COMPOSITE MATERIALS
SELF-LUBRICATED COMPOSITE
MATERIALS FOR HIGH-PRESSURE AIR
SEALS (FILAMENT-WOUND STRUCTURES),
AD-633 238

ELECTRIC CONNECTORS

HERMETIC SEALS IN PLASTIC BODIED
CONNECTORS,
AD-659 676

LIFE EXPECTANCY

SEAL SYSTEMS IN HYDROSPACE,
PHASE III: EFFECTS OF LONG TERM
HYDROSPACE EXPOSURE ON SEAL SYSTEM
INTEGRITY, 189 DAYS AT 3,900
FEET,
AD-865 361

SYNTHETIC RUBBER

TRANSLATION OF RUSSIAN PATENT,
A METHOD OF PRODUCING A HEAT-
RESISTANT HERMETIC SEALER BASED ON
FLUORINE-RUBBER,
AD-644 038

TEST METHODS

GROSS LEAK HERMETICITY TESTING
ANALYSIS,
AD-729 876

UNDERWATER VEHICLES

SEAL SYSTEMS IN HYDROSPACE,
PHASE II, CYCLIC LOADING OF FLANGE
AND HATCH SEAL SYSTEMS,
AD-684 080

HIGH EXPLOSIVE AMMUNITION

AN EVALUATION OF THE PERFORMANCE

UNCLASSIFIED

HIG-HYD

OF GAS CHECK GASKETS FOR NAVAL
PROJECTILES.
AD-056 228

•HIGH-PRESSURE RESEARCH

GASKETS

RESEARCH ON HIGH PRESSURE
MEDIA.*

AD-638 942

GASKETING MEDIA AT ULTRA-HIGH
PRESSURE.*

AD-665 859

GASKETING MEDIA AT ULTRA-HIGH
PRESSURE.*

AD-665 860

•HIGH-TEMPERATURE RESEARCH

SEALANTS EVALUATED FOR THE
PROPOSED HIGH TEMPERATURE (275
F) SEALANT SPECIFICATION
(MIL-S-8802). HIGH
TEMPERATURE RESISTANCE, ADHESION,
THERMAL SHOCK AND COMPATIBILITY
TESTS.

AD-288 232

•HONEYCOMB CORES

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM*

AD-265 775

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM*

AD-265 776

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM*

AD-271 429

•HOWITZERS

INVESTIGATION OF HYDROPNEUMATIC
RECOIL MECHANISM PACKING SPRING
LOADS*

AD-236 837

•HYDRAULIC ACTUATORS

DESIGN AND DEVELOPMENT OF A 1000
F HYDRAULIC SYSTEM, PART III, PHASE
II INVESTIGATION*

AD-257 940

•HYDRAULIC BRAKES

LANDING GEAR

COMPONENT IMPROVEMENT PROGRAM
FOR AIRCRAFT BRAKE PISTON SEALS.*
AD-728 216

•HYDRAULIC FLUID FILTERS

DESIGN AND DEVELOPMENT OF A 1000
F HYDRAULIC SYSTEM, PART III, PHASE
II INVESTIGATION*

AD-257 940

•HYDRAULIC SEALS

INVESTIGATION OF HYDROPNEUMATIC
RECOIL MECHANISM PACKING SPRING
LOADS*

AD-236 837

DESIGN AND DEVELOPMENT OF A 1000
F HYDRAULIC SYSTEM, PART III, PHASE
II INVESTIGATION*

AD-257 940

SUITABILITY OF VITON B O-RINGS
FOR USE IN 3000 PSI HYDRAULIC
SYSTEMS CONTAINING PETROLEUM BASE
OR PHOSPHATE ESTER FLUIDS*

AD-260 465

SUITABILITY OF VITON B O-RINGS
FOR USE IN 3000 PSI HYDRAULIC
SYSTEMS CONTAINING PETROLEUM BASE
FLUID OR CELLULUBE 220*

AD-270 746

A HERMETICALLY-SEALED COUPLING
FOR A SPACE POWER TRANSMISSION
FOR A 15 KW, 24,000 RPM POWER
UNIT,

AD-282 710

LITERATURE SEARCH DYNAMIC FLUID
SEALS FOR RECIPROCATING AND
ROTATING MACHINES;
MATERIALS ELASTOMERS,
PLASTICS, METALLIC, ASBESTOS,
PACKING SEALS,

AD-290 611

PERFORMANCE (ENGINEERING)

A STUDY OF CONVECTIVE INERTIA
EFFECTS AND METHODS OF CONTROLLING
GAS INGESTION IN LARGE DIAMETER
VISCOSEALS.*

AD-709 160

SHAFTS

AN INVESTIGATION INTERFACE

D-9
UNCLASSIFIED

HYD-LAN

UNCLASSIFIED

STABILITY AND ITS RELATION TO GAS
INGESTION IN VISCOSEALS.*

AD-693 191

THRUST BEARINGS

AN ANALYTICAL STUDY OF THIN
FLUID FILMS IN FACE-TYPE SHAFT
SEALS.

AD-460 741

•HYDRAULIC SERVOMECHANISMS

DESIGN AND DEVELOPMENT OF A 1000
F HYDRAULIC SYSTEM, PART III, PHASE
II INVESTIGATION*

AD-257 940

•HYDRAULIC SYSTEMS

DESIGN AND DEVELOPMENT OF A 1000
F HYDRAULIC SYSTEM, PART III, PHASE
II INVESTIGATION*

AD-257 940

SUITABILITY OF VITON B O-RINGS
FOR USE IN 3000 PSI HYDRAULIC
SYSTEMS CONTAINING PETROLEUM BASE
OR PHOSPHATE ESTER FLUIDS*

AD-260 465

SUITABILITY OF VITON B O-RINGS
FOR USE IN 3000 PSI HYDRAULIC
SYSTEMS CONTAINING PETROLEUM BASE
FLUID OR CELLULOSE 220*

AD-270 746

•HYDRAULIC VALVES

DESIGN AND DEVELOPMENT OF A 1000
F HYDRAULIC SYSTEM, PART III, PHASE
II INVESTIGATION*

AD-257 940

•HYDRAZINE

ELASTOMERS

EXPOSURE OF ELASTOMERS TO
HYDRAZINE AND AIR, WATER VAPOR, OR
CARBON DIOXIDE.*

AD-692 029

•HYDROPHONES

DESIGN

THE DESIGN OF DEEP-SUBMERGENCE
HYDROPHONES.*

AD-729 643

•INDIUM

GLASS SEALS

REPRINT: COLD WELDED INDIUM LOW
TEMPERATURE WINDOW SEAL.

AD-633 296

•INORGANIC COMPOUNDS

DEVELOPMENT OF COMPOSITE

MATERIALS FOR USE AS STATIC AND
DYNAMIC SEALS, CRYOGENIC TO
2000 F UP TO 500 PSI,
RECIPROCATING SHAFTS; SEALING
CABINS OF SPACESHIPS.

AD-291 984

•INTEGRATED CIRCUITS

HERMETIC SEALS

GROSS LEAK HERMETICITY TESTING
ANALYSIS.*

AD-729 876

•ISOCYANATE PLASTICS

PLASTIC SEALS

DEVELOPMENT OF SOLVENT-RESISTANT
SEALANTS.*

AD-650 315

PRESSURE DAMS IN COMMUNICATION
CABLES.*

AD-690 685

•JET FIGHTERS

LANDING GEAR

CLOSURE TECHNIQUE FOR LARGE
BEARINGS ON AIRCRAFT WHEELS.*

AD-723 679

•JOINTS

PLASTIC SEALS

TRANSLATION OF RUSSIAN RESEARCH:
TIGHTENING FLANGE JOINTS BY MEANS
OF HERMETICALLY SEALING PLASTIC.

AD-633 895

INVESTIGATION OF NONMETALLIC
WATERSTOPS, REPORT 8. EFFECT OF
SPECIMEN SIZE AND LOW TEMPERATURE
ON WATERSTOP TEST RESULTS.*

AD-737 174

•LANDING GEAR

HYDRAULIC BRAKES

COMPONENT IMPROVEMENT PROGRAM

D-10
UNCLASSIFIED

UNCLASSIFIED

LEA-MAN

FOR AIRCRAFT BRAKE PISTON SEALS,*
AD-728 216

•LEARNING

THE LOGIC OF AND A CIRCUIT FOR
DIFFERENTIATING AN AVOIDANCE
RESPONSE FROM AN ESCAPE RESPONSE.
AN ELECTRONIC GATE WHICH, IN
COMBINATION WITH AN ELECTRONIC
TIMER, TIMES THE DURATION OF SHOCK
RECEIVED BY AN ANIMAL. IT IS
POSSIBLE TO DISTINGUISH ACCURATELY
AN ESCAPE RESPONSE FROM AN
AVOIDANCE RESPONSE BY THIS
DEVICE.

AD-288 937

•LIGHT WATER REACTORS
COULANT PUMPS

HERMETICALLY SEALED PUMPS IN
NUCLEAR PROPULSION PLANTS--
TRANSLATION,
AD-713 267

•LIQUID METALS

A HERMETICALLY-SEALED COUPLING
FOR A SPACE POWER TRANSMISSION
FOR A 15 KW, 24,000 RPM POWER
UNIT,
AD-282 710

•LIQUID ROCKET FUELS
COMPATIBILITY

EVALUATION OF ELASTOMERS AS O-
RING SEALS FOR LIQUID ROCKET FUEL
AND OXIDIZER SYSTEMS,*

AD-422 466

LUBRICANTS, SEALANTS, THREADING
COMPOUNDS, PACKING AND GASKETS FOR
USE IN ABMA MISSILE SYSTEMS,
AD-468 035

•LIQUID ROCKET OXIDIZERS
COMPATIBILITY

EVALUATION OF ELASTOMERS AS O-
RING SEALS FOR LIQUID ROCKET FUEL
AND OXIDIZER SYSTEMS,*

AD-422 466

LUBRICANTS, SEALANTS, THREADING
COMPOUNDS, PACKING AND GASKETS FOR
USE IN ABMA MISSILE SYSTEMS,

AD-466 035

•LIQUID ROCKET PROPELLANTS
PLASTIC SEALS

EXPOSURE OF ELASTOMERS TO
HYDRAZINE AND AIR, WATER VAPOR, OR
CARBON DIOXIDE,*

AD-697 029

•LOCKING FASTENER DEVICES
MATHEMATICAL ANALYSIS

DESIGN ANALYSIS OF BELLEVILLE
WASHER SPRINGS FOR ENERGY STORAGE,
AD-431 961

•LUBRICANTS

COMPATIBILITY

LUBRICANTS, SEALANTS, THREADING
COMPOUNDS, PACKING AND GASKETS FOR
USE IN ABMA MISSILE SYSTEMS,

AD-466 035

HALOCARBON PLASTICS

METHOD OF INCREASING THE WEAR
RESISTANCE OF RUBBER SEALS--

TRANSLATION,

AD-713 038

SEALS

LUBRICATING COMPOSITION FOR
MERCURY WATER SEALS--TRANSLATION,
AD-721 032

•LUBRICATION

ANTIFRICTION BEARINGS

DEVICE FOR LUBRICATING BEARINGS--
TRANSLATION,

AD-718 180

•MANUFACTURING METHODS

GLASS HOLDER CRYSTAL UNITS*

AD-266 246

PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES*

AD-268 416

PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES*

AD-272 338

MANUFACTURING CRYSTALS IN THE

D-11

UNCLASSIFIED

UNCLASSIFIED

MAR-MET

FREQUENCY RANGE OF 1 TO 20 MC, TYPE
CR1XM-11/U AT THE RATE OF 500
PER 8-HR SHIFT, IN THE ALL-GLASS
HC-23/U TYPE HOLDER.
AD-282 498

MARINE PROPULSION
THRUST BEARINGS
MARINE THRUST BEARING--
TRANSLATION,
AD-717 881

MECHANICAL FASTENERS
PLASTIC SEALS
DEVELOPMENT OF FASTENER
COUNTERSINK CORROSION PROTECTION
SEALS.
AD-728 039

METAL SEALS
THE PHASE DIAGRAM FOR THE BINARY
SYSTEM CADMIUMTELLURIUM.
AD-228 831
METAL-TO-CERAMIC SEAL TECHNOLOGY
STUDY.
AD-248 535
TESTS OF PARKER RING SEAL FOR
BUOY POCKETS.
AD-258 893
PRELIMINARY INVESTIGATION OF SH-
1 CONTROL ROD SEAL FAILURE.
AD-259 803
INSPECTION OF SH-1 CONTROL ROD
SEAL COMPONENTS.
AD-265 582
DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM.
AD-265 775
DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM.
AD-265 776
CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES.
AD-266 158
DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM.
AD-271 429
ABSTRACTS OF MATERIAL EVALUATION
PROGRAMS CONDUCTED AT CHANCE VUGHT
CORPORATION.
AD-272 888

CERAMIC-METAL SEALS FOR HIGH-
POWER TUBES.
AD-275 082
PROGRESS REPORT ON DESIGN OF
CERAMIC-METAL SEALS FOR HIGH POWER
TUBES, MANUFACTURING METHODS;
PROCESSING; DESIGN; RELIABILITY
STUDIES,
AD-277 427
MATERIAL-ACCESS DOOR SEALANT-
SCREENING AND EVALUATION OF--
AD-283 410
CERAMIC-TO-METAL SEALS FOR HIGH
POWER TUBES, VARIABLES AFFECTING
SEAL TENSILE STRENGTHS, ACHIEVING
HIGHEST POSSIBLE RELIABILITY.
AD-285 106
DEVELOPMENT OF COMPOSITE
MATERIALS FOR USE AS STATIC AND
DYNAMIC SEALS, CRYOGENIC TO
2000 F UP TO 500 PSI,
RECIPROCATING SHAFTS; SEALING
CABINS OF SPACESHIPS,
AD-291 984
INVESTIGATION OF VARIABLES
ASSOCIATED WITH THE FABRICATION OF
METAL-TO-CERAMIC SEALS TO
UNDERSTAND MECHANISMS OF FAILURE
AND IMPROVE MANUFACTURING
PROCESSES,
AD-404 088
BRAZING
BRAZING STUDY TO PRODUCE
RELIABLE END SEALS FOR POWER WIRE
SYSTEMS,
AD-602 144
CORROSION
GALVANIC CORROSION BEHAVIOR OF
WEAR-RESISTANT MATERIALS FOR
MECHANICAL SHAFT SEALS.
AD-635 592
DIELECTRICS
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY,
AD-409 160
ELECTRONIC EQUIPMENT
METALLURGICAL RESEARCH AND

D-12
UNCLASSIFIED

UNCLASSIFIED

MIC-O-R

DEVELOPMENT FOR CERAMIC ELECTRON
DEVICES.*
AD-636 950

MICROWAVE EQUIPMENT
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.*
AD-414 763

PERFORMANCE (ENGINEERING)
METALLIC BOSS SEAL EVALUATION
AND TEST PROGRAM.
AD-608 139

VALVES
CONTAMINANT PARTICLES IN METAL-
TO-METAL CLOSURES.*
AD-734 232

WAVEGUIDE WINDOWS
SOLDER-GLASS SEALING OF
MICROWAVE ANTENNA WINDOWS.
AD-610 837

MICROWAVE EQUIPMENT
SEALS
METALLURGICAL RESEARCH AND
DEVELOPMENT FOR CERAMIC ELECTRON
DEVICES.*
AD-638 950

VACUUM SEALS
DIELECTRIC TO METAL SEAL
TECHNOLOGY STUDY.*
AD-419 783

MINIATURE ELECTRON TUBES
PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES.*
AD-268 414
PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES.*
AD-282 892

MOISTURE
MECHANISMS GOVERNING FLOW OF
WATER AND WATER VAPOR THROUGH
ROTARY SEALS; EFFECTIVE MOISTURE
BARRIERS FOR FIRE CONTROL

INSTRUMENTS.
AD-406 307

*NICKEL ALLOYS
CRYOGENICS
CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED), VOLUME II.
SECTIONS D, E, F, G, H AND I.*
AD-713 620

*OIL SEALS
ANALYSIS OF FLUID SEAL PROBLEMS
ON WEAPON SYSTEMS.
AD-288 540

ANTIFRICTION BEARINGS
BEARING AND SEAL SCALABILITY
STUDY.*
AD-729 329

DESIGN
THEORETICAL INVESTIGATION OF OIL
BACKSTREAMING THROUGH A VACUUM
THAP.
AD-410 925

FLUID FLOW
AN EXPERIMENTAL STUDY OF THE
VISCOSEAL BEARING.*
AD-686 175

ROLLER BEARINGS
CLOSURE TECHNIQUE FOR LARGE
BEARINGS ON AIRCRAFT WHEELS.*
AD-723 679

SHAFTS
BEARING AND SEAL TECHNOLOGY
REVIEW.*
AD-729 328

*O-RINGS
COMPRESSIVE PROPERTIES
THE THEORY OF PLANE ELASTIC
DEFORMATION APPLIED TO THE
COMPRESSION OF RUBBER SEALS.*
AD-693 195

FUEL INJECTORS
INVESTIGATING FUEL-ALCOHOL
EFFECTS ON ELASTOMER COMPONENTS OF

D-13
UNCLASSIFIED

UNCLASSIFIED

PHA-PLA

DIESEL INJECTOR SYSTEMS,*
AD-665 374

FUEL SEALS
ELASTOMERS AS O-RING SEALS FOR
LIQUID ROCKET FUEL AND OXIDIZER
SYSTEMS,
AD-602 240

LEAKAGE (FLUID)
COMPONENT IMPROVEMENT PROGRAM
FOR AIRCRAFT BRAKE PISTON SEALS,*
AD-728 216

PIPES
REPRINT: A SIMPLE VACUUM SEAL
FOR NON-CIRCULAR TUBES,
AD-652 917

RADIATION DAMAGE
EFFECTS OF REACTOR RADIATION ON
THE PHYSICAL PROPERTIES OF TWO
RADIATION-RESISTANT O-RING
COMPOUNDS,
AD-612 604

PHASE STUDIES
THE PHASE DIAGRAM FOR THE BINARY
SYSTEM CADMIUM-TELLURIUM,*
AD-235 031

PHOTOELASTICITY
ABSTRACTS OF MATERIAL EVALUATION
PROGRAMS CONDUCTED AT CHANCE VUGHT
CORPORATION,*
AD-272 888

PISTONS
O-RINGS
COMPONENT IMPROVEMENT PROGRAM
FOR AIRCRAFT BRAKE PISTON SEALS,*
AD-728 216

PLASTIC COATINGS
CORROSION INHIBITION
DEVELOPMENT OF FASTENER
COUNTERSINK CORROSION PROTECTION
SEALS,*
AD-728 039

PLASTIC SEALS

HALOCARBON PLASTIC
SEAL DESIGN AND SEALING
TECHNIQUES FOR KEL-F, TEFLON AND
HALON; SPIN SEALING,
AD-428 599

HIGH-PRESSURE COMPRESSORS
SELF-LUBRICATED SEALS
DEVELOPMENT FOR HIGH-PRESSURE, OIL-
FREE COMPRESSORS,
AD-627 230

ISOCYANATE PLASTICS
PRESSURE DAMS IN COMMUNICATION
CABLES,*
AD-698 685

JOINTS
TRANSLATION OF RUSSIAN RESEARCH:
TIGHTENING FLANGE JOINTS BY MEANS
OF HERMETICALLY SEALING PLASTIC,
AD-633 895
INVESTIGATION OF NONMETALLIC
WATERSTOPS, REPORT 8, EFFECT OF
SPECIMEN SIZE AND LOW TEMPERATURE
ON WATERSTOP TEST RESULTS,*
AD-737 174

LIQUID ROCKET PROPELLANTS
EXPOSURE OF ELASTOMERS TO
HYDRAZINE AND AIR, WATER VAPOR, OR
CARBON DIOXIDE,*
AD-697 029

MECHANICAL FASTENERS
DEVELOPMENT OF FASTENER
COUNTERSINK CORROSION PROTECTION
SEALS,*
AD-728 039

PUMPS
POSSIBLE USE OF MATERIALS BASED
ON POLYTETRAFLUOROETHYLENE FOR
PACKING DRILLING PUMPS--
TRANSLATION,
AD-720 928

STABILITY
DEVELOPMENT OF SOLVENT-RESISTANT
SEALANTS,*
AD-650 315

UNCLASSIFIED

PNE-REA

VACUUM SEALS

A VACUUM SEAL FOR INTRODUCTION
OF LEADS INTO CRYOGENIC EQUIPMENT
USE OF COMMERCIALY AVAILABLE PARTS
WITH EPOXY CEMENT.
AD-410 018

PNEUMATIC DEVICES

INVESTIGATION OF HYDROPNEUMATIC
RECOIL MECHANISM PACKING SPRING
LOADS.
AD-236 037

PNEUMATIC SYSTEMS

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.
AD-260 920
DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.
AD-267 121

RUBBER SEALS

SUITABILITY OF VITON B O-RINGS
FOR SEALING 12,500 PSIG AIR
SYSTEMS: OXYGEN AGING.
AD-430 727

POLYMERS

CRYOGENICS
CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED). VOLUME II.
SECTIONS D, E, F, G, H AND I.
AD-713 620

PRESSURE SUITS

FASTENINGS
PRESSURE SEALING CLOSURES FOR
FULL PRESSURE PROTECTIVE SUIT
ASSEMBLIES.
AD-658 204

PROJECTILES

AN EVALUATION OF THE PERFORMANCE
OF GAS CHECK GASKETS FOR NAVAL
PROJECTILES.
AD-055 228

PUMPS

DESIGN AND DEVELOPMENT OF A 1000
F HYDRAULIC SYSTEM, PART III, PHASE
II INVESTIGATION.

AD-257 940

PLASTIC SEALS

POSSIBLE USE OF MATERIALS BASED
ON POLYTETRAFLUOROETHYLENE FOR
PACKING DRILLING PUMPS--
TRANSLATION.
AD-720 928

QUARTZ

GLASS HOLDER CRYSTAL UNITS.
AD-266 246
MANUFACTURING CRYSTALS IN THE
FREQUENCY RANGE OF 1 TO 20 MC, TYPE
CR1X-111/U AT THE RATE OF 500
PER 8-HR SHIFT, IN THE ALL-GLASS
HC-27/J TYPE HOLDER.
AD-283 498

QUARTZ RESONATORS

MANUFACTURING METHODS
PRODUCING A SEMI-PRECISION
QUARTZ CRYSTAL UNIT IN AN EVACUATED
GLASS HOLDER. DESIGN OF 15-MC
RESONATORS.
AD-413 654

RADIATION DAMAGE

THE EFFECTS OF REACTOR RADIATION
ON ELASTOMERS AND SEALANTS. III.
AD-256 689

O-RINGS

EFFECTS OF REACTOR RADIATION ON
THE PHYSICAL PROPERTIES OF TWO
RADIATION-RESISTANT O-RING
COMPOUNDS.
AD-612 604

REACTION (PSYCHOLOGY)

THE LOGIC OF AND A CIRCUIT FOR
DIFFERENTIATING AN AVOIDANCE
RESPONSE FROM AN ESCAPE RESPONSE.
AN ELECTRONIC GATE WHICH, IN
COMBINATION WITH AN ELECTRONIC
TIMER, TIMES THE DURATION OF SHOCK
RECEIVED BY AN ANIMAL, IT IS
POSSIBLE TO DISTINGUISH ACCURATELY
AN ESCAPE RESPONSE FROM AN
AVOIDANCE RESPONSE BY THIS
DEVICE.

D-15

UNCLASSIFIED

UNCLASSIFIED

REA-ROT

AD-286 937

REACTOR SAFETY SYSTEMS

PRELIMINARY INVESTIGATION OF SH-1 CONTROL ROD SEAL FAILURE

AD-259 803

RECOIL MECHANISMS

INVESTIGATION OF HYDROPNEUMATIC RECOIL MECHANISM PACKING SPRING LOADS

AD-236 837

REFLEXES

THE LOGIC OF AND A CIRCUIT FOR DIFFERENTIATING AN AVOIDANCE RESPONSE FROM AN ESCAPE RESPONSE, AN ELECTRONIC GATE WHICH, IN COMBINATION WITH AN ELECTRONIC TIMER, TIMES THE DURATION OF SHOCK RECEIVED BY AN ANIMAL. IT IS POSSIBLE TO DISTINGUISH ACCURATELY AN ESCAPE RESPONSE FROM AN AVOIDANCE RESPONSE BY THIS DEVICE.

AD-288 937

REFRACTORY MATERIALS

CERAMIC TO METAL SEALS FOR HIGH-TEMPERATURE THERMIONIC CONVERTERS. TEMPERATURE GOAL FOR SEALS AND MATERIALS DEVELOPED IN THE PROGRAM IS 2000 C.

AD-294 155

REINFORCED PLASTICS

CRYOGENICS

CRYOGENIC MATERIALS DATA HANDBOOK (REVISED). VOLUME 11, SECTIONS D, E, F, G, H AND I.

AD-713 620

RESONATORS

MANUFACTURING METHODS

PRODUCING A SEMI-PRECISION QUARTZ CRYSTAL UNIT IN AN EVACUATED GLASS HOLDER, DESIGN OF 15-MC RESONATORS.

AD-413 654

ROCKET MOTORS (LIQUID PROPELLANT)

GASKETS

STUDY OF O-RINGS AGING CHARACTERISTICS.

AD-426 305

ROLLER BEARINGS

OIL SEALS

CLOSURE TECHNIQUE FOR LARGE BEARINGS ON AIRCRAFT WHEELS.

AD-723 679

ROTARY PUMPS

LITERATURE SEARCH DYNAMIC FLUID SEALS FOR RECIPROCATING AND ROTATING MACHINES; MATERIALS ELASTOMERS, PLASTICS, METALLIC, ASBESTOS, PACKING SEALS.

AD-290 611

ROTARY SEALS

DYNAMIC SHAFT SEALS IN SPACE.

AD-283 365

LITERATURE SEARCH DYNAMIC FLUID SEALS FOR RECIPROCATING AND ROTATING MACHINES;

MATERIALS ELASTOMERS, PLASTICS, METALLIC, ASBESTOS, PACKING SEALS.

AD-290 611

DYNAMIC SHAFT SEALS IN SPACE.

AD-295 700

SEALING HIGH SPEED ROTATING SHAFTS UNDER OPERATING CONDITIONS OF HIGH TEMPERATURE LIQUID METALS AND VAPORS IN A NEAR-VACUUM ENVIRONMENT OF SPACE.

AD-400 255

DYNAMIC SHAFT SEALS IN A SPACE ENVIRONMENT.

AD-405 056

MECHANISMS GOVERNING FLOW OF WATER AND WATER VAPOR THROUGH ROTARY SEALS; EFFECTIVE MOISTURE BARRIERS FOR FIRE CONTROL INSTRUMENTS.

AD-406 307

LAMINAR FLOW

TWO-FLUID FLOWS IN FACE SEALS.

D-16

UNCLASSIFIED

UNCLASSIFIED

RUB-RUB

AD-708 891

PRESSURE VESSELS

TRANSLATION OF RUSSIAN PATENT:
CLUTCH FOR TRANSMITTING ROTARY
MOTION INTO AN AIR-TIGHT HOUSING.

AD-622 373

SHAFTS

DYNAMIC SHAFT SEALS IN SPACE.

AD-423 319

DYNAMIC SHAFT SEALS IN SPACE.

AD-429 211

DYNAMIC SHAFT SEALS IN SPACE.

AD-432 064

TRANSLATION OF RUSSIAN PATENT:
END SEALING OF A SHAFT.

AD-621 011

TRANSLATION OF RUSSIAN PATENT.
CENTRIFUGAL SEALING OF A ROTATING
SHAFT.

AD-623 210

SPACE PROPULSION

DYNAMIC SHAFT SEALS IN SPACE.

AD-603 655

TEST FACILITIES

DYNAMIC SHAFT SEALS FOR
OPERATION IN HIGH TEMPERATURE
LIQUID METAL ENVIRONMENTS IN SPACE.

AD-601 332

TURBULENCE

BASIC RESEARCH IN DYNAMIC
SEALING.

AD-732 021

RUBBER

GASKETS

SHELF LIFE OF O-RINGS STORED AT
70-80 ° UNDER VARIOUS CONDITIONS OF
EXPOSURE TO LIGHT AND AIR.

AD-430 759

RUBBER ADHESIVES

THE EFFECTS OF REACTOR RADIATION
ON ELASTOMERS AND SEALANTS, III.

AD-256 689

RUBBER GASKETS

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUB-MARINES.

AD-256 218

TESTS OF PARKER RING SEAL FOR
BUOY POCKETS.

AD-258 893

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUBMARINES.

AD-265 555

MANUFACTURING METHODS

TRAPPED RUBBER BLANKING AND
PIERCING PRODUCTION EVALUATION.

AD-677 734

RUBBER SEALS

THE EFFECTS OF REACTOR RADIATION
ON ELASTOMERS AND SEALANTS, III.

AD-256 689

TESTS OF PARKER RING SEAL FOR
BUOY POCKETS.

AD-258 893

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.

AD-260 920

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.

AD-261 561

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.

AD-261 562

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.

AD-261 563

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.

AD-261 564

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.

AD-267 121

SUITABILITY OF VITON B O-RINGS
FOR USE IN 3000 PSI HYDRAULIC
SYSTEMS CONTAINING PETROLEUM BASE
FLUID OR CELLULOSE 220.

AD-270 746

ELASTOMERIC SEALS AND MATERIALS
AT CRYOGENIC TEMPERATURES.

AD-274 176

FAIRPRENE INTEGRAL FUEL TANK

D-17

UNCLASSIFIED

UNCLASSIFIED

RYS-SEA

SEALING MATERIAL - SWELLING
CHARACTERISTICS OF,•

AD-292 287

SURVEILLANCE TESTS OF MARK 15
POLARIS INTERTUBE SEALS,•

AD-299 393

COMPATIBILITY

EVALUATION OF ELASTOMERS AS O-
RING SEALS FOR LIQUID ROCKET FUEL
AND OXIDIZER SYSTEMS,•

AD-422 466

GUIDED MISSILE LAUNCHERS

DEVELOPMENT OF SEALS FOR
ADVANCED-DESIGN POLARIS LAUNCHING
SYSTEM,•

AD-601 033

PNEUMATIC DEVICES

SUITABILITY OF VITON O-RINGS
FOR SEALING 12,500 PSIG AIR
SYSTEMS: OXYGEN FILING,•

AD-430 727

SONAR DOMES

PRESSURIZED BOW DOME OF A CABLE-
REINFORCED RUBBER CONSTRUCTION FOR
USE WITH AN/SOS-26 SONAR,•

AD-610 189

WEAR RESISTANCE

METHOD OF INCREASING THE WEAR
RESISTANCE OF RUBBER SEALS--
TRANSLATION,•

AD-713 038

CRYSTAL HOLDERS

PRODUCTION

PRODUCING A SEMI-PRECISION
QUARTZ CRYSTAL UNIT IN AN EVACUATED
GLASS HOLDER, DESIGN OF 15-MC
RESONATORS,•

AD-413 654

SAFETY DEVICES

AN EVALUATION OF THE PERFORMANCE
OF GAS CHECK GASKEYS FOR NAVAL
PROJECTILES,•

AD-056 228

•SANDWICH PANELS

DEVELOPMENT OF EXO-REACTANT

INORGANIC ADHESIVE SYSTEM,•

AD-265 775

DEVELOPMENT OF EXO-REACTANT

INORGANIC ADHESIVE SYSTEM,•

AD-265 776

DEVELOPMENT OF EXO-REACTANT

INORGANIC ADHESIVE SYSTEM,•

AD-271 429

•SCREWS

PATENTS

SELF-SEALING SCREW--TRANSLATION,•

AD-724 992

•SEALING COMPOUNDS

THE EFFECTS OF REACTOR RADIATION
ON ELASTOMERS AND SEALANTS, III,•

AD-256 609

MATERIAL-ACCESS DOOR SEALANT-

SCREENING AND EVALUATION OF,•

AD-283 410

SEALANTS FOR CLOSING JOGGLE
CRACKS AND VOIDS IN THE CLOSURE
RIB FIREWALLS ON THE B-52 TESTED
FOR HIGH TEMPERATURE, VIBRATION,
AND FLAME RESISTANCE,•

AD-286 230

SEALANTS EVALUATED FOR THE
PROPOSED HIGH TEMPERATURE (27:
F) SEALANT SPECIFICATION
(MIL-S-8802), HIGH
TEMPERATURE RESISTANCE, ADHESION,
THERMAL SHOCK AND COMPATIBILITY
TESTS,•

AD-286 232

FAIRPRENE INTEGRAL FUEL TANK

SEALING MATERIAL - SWELLING

CHARACTERISTICS OF,•

AD-292 287

COMPATIBILITY

LUBRICANTS, SEALANTS, THREADING
COMPOUNDS, PACKING AND GASKETS FOR
USE IN ABMA MISSILE SYSTEMS,•

AD-466 035

CRYOGENICS

REPRINT: A CONVENIENT AND
RELIABLE DEMOUNTABLE SEAL FOR LOW

UNCLASSIFIED

SEA-SEA

TEMPERATURE WORK.
AD-735 230

SEALS

BEARINGS

AN INVESTIGATION INTERFACE
STABILITY AND ITS RELATION TO GAS
INGESTION IN VISCOSSEALS.*
AD-693 191

BREECH MECHANISMS

SILICONE-ASBESTOS OBTURATOR PADS
FOR 175MM GUN, M113A 1, A PRODUCT
IMPROVEMENT.*
AD-720 988

CERAMIC MATERIALS

METALLURGICAL RESEARCH AND
DEVELOPMENT FOR CERAMIC ELECTRON
DEVICES.*
AD-636 950

CRYOGENICS

CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED). VOLUME 11.
SECTIONS D, E, F, G, H AND I.*
AD-712 620

ENVIRONMENTAL TESTS

INVESTIGATION OF NONMETALLIC
WATERSTOPS. REPORT 5, WATER
RETENTIVITY OF LABYRINTH-SHAPED
WATERSTOPS.*
AD-716 226

HYDRODYNAMICS

TURBULENCE AND INERTIA EFFECTS
IN THE ALIGNED FACE SEAL.*
AD-730 723

LUBRICANTS

LUBRICATING COMPOSITION FOR
MERCURY WATER SEALS--TRANSLATION.
AD-721 032

MATERIALS

DEVELOPMENT OF SOLVENT-RESISTANT
SEALANTS.*
AD-650 315

PERFORMANCE (ENGINEERING)

SEAL SYSTEMS IN HYDROSPACE.
PHASE 1. MECHANICAL INTEGRITY OF
FLANGE SEAL SYSTEMS.*

AD-843 582

TEST METHODS

INVESTIGATION OF NONMETALLIC
WATERSTOPS. REPORT 7, PREPARATION
OF LABORATORY TEST SAMPLES FROM
FINISHED WATERSTOPS.*
AD-714 219

SEALS (STOPPERS)

INVESTIGATION OF HYDROPNEUMATIC
RECOIL MECHANISM PACKING SPRING
LOADS.*

AD-236 837

METAL-TO-CERAMIC SEAL TECHNOLOGY
STUDY.*

AD-248 535

TESTS OF PARKER RING SEAL FOR
BUOY POCKETS.*

AD-258 893

PRELIMINARY INVESTIGATION OF SM-
1 CONTROL ROD SEAL FAILURE.*

AD-259 803

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.*
AD-260 920

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.*
AD-261 561

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.*
AD-261 562

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.*
AD-261 563

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.*
AD-261 564

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.*
AD-267 121

ELASTOMERIC SEALS AND MATERIALS
AT CRYOGENIC TEMPERATURES.*

AD-274 176

DYNAMIC SHAFT SEALS IN SPACE.*

AD-283 365

MATERIAL-ACCESS DOOR SEALANT-
SCREENING AND EVALUATION OF.*

D-19

UNCLASSIFIED

SEA-SPA

UNCLASSIFIED

AD-283 410

FUEL SEALING SYSTEMS FOR SPACE
AND RE-ENTRY OPERATIONS, A
SILVER IMPREGNATED METAL-
FIBER COMPOSITE SEAL WAS TESTED BY
INSTALLING THE SEAL BETWEEN
THE FAYING SURFACES OF A STEEL
TANK AND APPLYING INTERNAL AIR
PRESSURES.

AD-284 074

DEVELOPMENT OF COMPOSITE
MATERIALS FOR USE AS STATIC AND
DYNAMIC SEALS, CRYOGENIC TO
2000 F UP TO 500 PSI,
RECIPROCATING SHAFTS; SEALING
CABINS OF SPACESHIPS.

AD-291 984

CERAMIC TO METAL SEALS FOR
HIGH-TEMPERATURE THERMIONIC
CONVERTERS. TEMPERATURE GOAL FOR
SEALS AND MATERIALS
DEVELOPED IN THE PROGRAM IS 2000
C.

AD-294 155

DYNAMIC SHAFT SEALS IN SPACE.

AD-295 700

SEALING HIGH SPEED ROTATING
SHAFTS UNDER OPERATING
CONDITIONS OF HIGH TEMPERATURE
LIQUID METALS AND VAPORS IN A NEAR-
VACUUM ENVIRONMENT OF SPACE.

AD-400 255

MECHANISMS GOVERNING FLOW OF
WATER AND WATER VAPOR THROUGH
ROTARY SEALS; EFFECTIVE MOISTURE
BARRIERS FOR FIRE CONTROL
INSTRUMENTS.

AD-406 307

LIQUID METALS

DYNAMIC SHAFT SEALS FOR
OPERATION IN HIGH TEMPERATURE
LIQUID METAL ENVIRONMENTS IN SPACE.

AD-601 338

DYNAMIC SHAFT SEALS IN SPACE.

AD-602 655

PNEUMATIC DEVICES

SUITABILITY OF VITON B O-RINGS
FOR SEALING 12,500 PSIG AIR
SYSTEMS; OXYGEN AGING.

AD-430 727

SPACE ENVIRONMENTAL CONDITIONS
DYNAMIC SHAFT SEALS IN SPACE.

AD-423 319

DYNAMIC SHAFT SEALS IN SPACE.

AD-429 211

DYNAMIC SHAFT SEALS IN SPACE.

AD-432 064

SUBMARINES

PROPOSED MILITARY SPECIFICATION
GASKETS, HATCH SEAL O-RING, OIL-
RESISTANT RUBBER.

AD-424 301

•SEALS (STOPPERS)

HIGH-PRESSURE COMPRESSORS

SELF-LUBRICATED SEALS

DEVELOPMENT FOR HIGH-PRESSURE, OIL-
FREE COMPRESSORS.

AD-627 230

•SEMICONDUCTORS

THE PHASE DIAGRAM FOR THE BINARY
SYSTEM CADMIUMTELLURIUM.

AD-235 831

•SHAFTS

HYDRAULIC SEALS

AN INVESTIGATION INTERFACE

STABILITY AND ITS RELATION TO GAS
INGESTION IN VISCOSEALS.

AD-693 191

ROTARY SEALS

TRANSLATION OF RUSSIAN PATENT:

END SEALING OF A SHAFT.

AD-621 011

REPRINT: VISCO-TYPE GAS

SEALING.

AD-499 291

•SONAR DOMES

RUBBER SEALS

PRESSURIZED BOW DOME OF A CABLE-

REINFORCED RUBBER CONSTRUCTION FOR
USE WITH AN/SQS-26 SONAR.

AD-610 189

•SPACE PROPULSION

D-20

UNCLASSIFIED

UNCLASSIFIED

SPR-TES

SEALS (STOPPERS)

DYNAMIC SHAFT SEALS IN SPACE.

AD-602 655

SPRINGS

INVESTIGATION OF HYDROPNEUMATIC
RECOIL MECHANISM PACKING SPRING
LOADS.

AD-236 837

STAINLESS STEEL

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM.

AD-271 429

CORROSION

PROTECTION OF OSRV SEAL SEAT
SURFACES EXPOSED TO CYCLIC PRESSURE
IN SEAWATER.

AD-731 356

METAL SEALS

METALLIC BOSS SEAL EVALUATION
AND TEST PROGRAM.

AD-606 139

STEEL

CRYOGENICS

CRYOGENIC MATERIALS DATA
HANDBOOK (REVISED). VOLUME II,
SECTIONS D, E, F, G, H AND I.

AD-713 620

STRUCTURAL PARTS

DESIGN

STRUCTURAL DESIGN OF CONICAL
ACRYLIC VIEWPORTS.

AD-710 350

SUBMARINES

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.

AD-260 920

SUPERSONIC WIND TUNNELS

CENTRIFUGAL COMPRESSORS

COMPRESSOR AIR SEAL FAILURE,
SUPERSONIC WIND TUNNELS, ABERDEEN
PROVING GROUND, MARYLAND, 20 MAY
1969.

AD-699 315

SYNTHETIC RUBBER

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUB-MARINES.

AD-256 218

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES.

AD-261 562

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUBMARINES.

AD-265 555

DEVELOPMENT OF ELASTOMER
MATERIALS FOR GASKETS TO BE USED
IN SUBMARINE HIGH PRESSURE AIR
AND O₂ SYSTEMS.

AD-285 966

DETERMINATION OF THE PHYSICAL
PROPERTIES OF THIKOL 'ST'
SYNTHETIC RUBBER PREFABRICATED
FILLETS USED FOR SEALING THE
INTEGRAL FUEL TANKS ON B-58
AIRPLANES.

AD-286 237

HERMETIC SEALS

TRANSLATION OF RUSSIAN PATENT,
A METHOD OF PRODUCING A HEAT-
RESISTANT HERMETIC SEALER BASED ON
FLUORINE-RUBBER.

AD-644 038

RUBBER SEALS

DEVELOPMENT OF SEALS FOR
ADVANCED-DESIGN POLARIS LAUNCHING
SYSTEM.

AD-601 033

TELEPHONE LINES

PLASTIC SEALS

PRESSURE DAMS IN COMMUNICATION
CABLES.

AD-698 685

TELLURIUM

THE PHASE DIAGRAM FOR THE BINARY
SYSTEM CADMIUM-TELLURIUM.

AD-235 831

TEST FACILITIES

MOISTURE TESTS ON ROTARY SEALS

D-21

UNCLASSIFIED

UNCLASSIFIED

THR-VAC

AND TESTING FACILITIES DESIGN.
AD-404 308

•THRUST BEARINGS

DESIGN
MARINE THRUST BEARING--
TRANSLATION.
AD-717 881

•THYRATRONS

PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES.

AD-268 416

PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES.

AD-272 338

PRODUCTION ENGINEERING MEASURE
FOR POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES.

AD-282 892

•TRANSMISSIONS

A HERMETICALLY-SEALED COUPLING
FOR A SPACE POWER TRANSMISSION
FOR A 15 KW, 24,000 RPM POWER
UNIT.

AD-282 710

•TRIODES

PRODUCTION

PRODUCTION ENGINEERING MEASURE
ON CERAMIC TRIODES, VACUUM EXHAUST
EQUIPMENT INSTALLATION.

AD-429 993

•TURBOJET ENGINES

ANTIFRICTION BEARINGS
BEARING AND SEAL SCALABILITY
STUDY.

AD-729 329

•ULTRASONIC WELDING

COPPER

ULTRASONIC WELDING OF PS117
COPPER THIMBLES.

AD-708 934

•UNDERWATER VEHICLES

HERMETIC SEALS

SEAL SYSTEMS IN HYDROSPACE,
PHASE II: CYCLIC LOADING OF FLANGE
AND HATCH SEAL SYSTEMS.

AD-684 080

SEAL SYSTEMS IN HYDROSPACE,
PHASE III: EFFECTS OF LONG TERM
HYDROSPACE EXPOSURE ON SEAL SYSTEM
INTEGRITY. 189 DAYS AT 5,900
FEET.

AD-865 361

VISIBILITY

STRUCTURAL DESIGN OF CONICAL
ACRYLIC VIEWPORTS.

AD-710 350

•VACUUM PUMPS

VACUUM SEALS

TRANSLATION OF RUSSIAN RESEARCH;
METHOD OF PUMPING OF VACUUM
SYSTEMS.

AD-656 564

•VACUUM SEALS

CRYOGENICS

REPRINT: A CONVENIENT AND
RELIABLE DEMOUNTABLE SEAL FOR LOW
TEMPERATURE WORK.

AD-735 230

DESIGN

REPRINT: A SIMPLE HIGH VOLTAGE
VACUUM SEAL.

AD-695 739

FRICTION

EXPERIMENTAL DETERMINATION OF
THE COEFFICIENT OF FRICTION DURING
THE CONTACT OF A SPHERE WITH A CONE--
TRANSLATION.

AD-736 400

PIPES

REPRINT: HEAT SHRINKABLE TUBING
AS AN INEXPENSIVE VACUUM SEAL.

AD-730 251

PLASTIC SEALS

A VACUUM SEAL FOR INTRODUCTION
OF LEADS INTO CRYOGENIC EQUIPMENT
USE OF COMMERCIALY AVAILABLE PARTS

UNCLASSIFIED

VAL-WAV

WITH EPOXY CEMENT,
AD-410 018

AD-610 837

TRIODES
PRODUCTION ENGINEERING MEASURE
ON CERAMIC TRIODES. VACUUM EXHAUST
EQUIPMENT INSTALLATION,
AD-429 993

VACUUM PUMPS
TRANSLATION OF RUSSIAN RESEARCH:
METHOD OF PUMPING OF VACUUM
SYSTEMS,
AD-656 564

VALVES
METAL SEALS
CONTAMINANT PARTICLES IN METAL-
TO-METAL CLOSURES,
AD-734 232

VAPORS
A HERMETICALLY-SEALED COUPLING
FOR A SPACE POWER TRANSMISSION
FOR A 15 KW, 24,000 RPM POWER
UNIT,
AD-282 710

VULCANIZATES
DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES,
AD-261 561

WATER VAPOR
MECHANISMS GOVERNING FLOW OF
WATER AND WATER VAPOR THROUGH
ROTARY SEALS; EFFECTIVE MOISTURE
BARRIERS FOR FIRE CONTROL
INSTRUMENTS,
AD-406 307

WATERTIGHT FITTINGS
UNDERWATER EQUIPMENT
A CABLE GLAND FOR DEEP-SEA
OPERATION,
AD-870 494

WAVEGUIDE WINDOWS
GLASS SEALS
SOLDER-GLASS SEALING OF
MICROWAVE ANTENNA WINDOWS,

D-23
UNCLASSIFIED

UNCLASSIFIED

TITLE INDEX

ABSTRACTS OF MATERIAL EVALUATION PROGRAMS CONDUCTED AT CHANCE VUGHT CORPORATION(U) •ALUMINUM ALLOYS	AD-278 888	CERAMIC-METAL SEALS FOR HIGH-POWER TUBES(U) •ELECTRON TUBES	AD-277 987
ANALYTIC DEVELOPMENT OF DESIRABLE STRESS DISTRIBUTION CHARACTERISTICS IN SEALING RINGS LEADING TO RECOMMENDATION OF RING NO. 5 FOR APPLICATION TO CLOSED BREECH LAUNCHERS(U) •GAS SEALS	AD-239 509	CERAMIC-METAL SEALS FOR HIGH-POWER TUBES(U) •ELECTRON TUBES	AD-285 104
AN ANALYTICAL STUDY OF THIN FLUID FILMS IN FACETYPE SHAFT SEALS(U) •HYDRAULIC SEALS	AD-460 741	CERAMIC-METAL SEALS FOR HIGH-POWER TUBES(U) •METAL SEALS	AD-404 088
APPLIED RESEARCH ON A HERMETICALLY-SEALED DRIVE COUPLING FOR SPACE POWER TRANSMISSION(U) •AUXILIARY POWER PLANTS	AD-282 710	CERAMIC TO METAL SEALS FOR HIGH-TEMPERATURE THERMIONIC CONVERTERS(U) •CERAMIC MATERIALS	AD-294 155
BASIC RESEARCH IN DYNAMIC SEALING(U) •ROTARY SEALS	AD-732 021	7486 CERAMIC TRIODE, PRODUCTION ENGINEERING MEASURE(U) •TRIODES	AD-429 993
BEARING AND SEAL SCALABILITY STUDY(U) •ANTI-FRICTION BEARINGS	AD-729 329	CLOSURE TECHNIQUE FOR LARGE BEARINGS ON AIRCRAFT WHEELS(U) •ROLLER BEARINGS	AD-723 479
BEARING AND SEAL TECHNOLOGY REVIEW(U) •BEARINGS	AD-729 328	CLUTCH FOR TRANSMITTING ROTARY MOTION INTO AN AIR-TIGHT HOUSING(U) •CLUTCHES	AD-622 373
A CABLE GLAND FOR DEEP- SEA OPERATION(U) •WATERTIGHT FITTINGS	AD-870 494	COLD WELDED INDIUM LOW TEMPERATURE WINDOW SEAL(U) •INDIUM	AD-633 296
CENTRIFUGAL SEALING OF A ROTATING SHAFT(U) •ROTARY SEALS	AD-623 210	COMPONENT IMPROVEMENT PROGRAM FOR AIRCRAFT BRAKE PISTON SEALS(U) •PISTONS	AD-728 216
CERAMIC-METAL SEALS FOR HIGH-POWER TUBES(U) •CERAMIC MATERIALS	AD-266 158	COMPOSITE INORGANIC RESILIENT SEAL MATERIALS(U) •COMPOSITE MATERIALS	AD-291 984
CERAMIC-METAL SEALS FOR HIGH-POWER TUBES(U) •CERAMIC MATERIALS	AD-275 082	COMPOUNDING DEVELOPMENT OF ELASTOMERS FOR GASKETS FOR SUBMARINE HIGH PRESSURE AIR AND OXYGEN SYSTEMS(U) •ELASTOMERS	AD-285 946
		COMPRESSOR AIR SEAL	AD-699 313

CON-DEV

UNCLASSIFIED

FAILURE, SUPERSONIC WIND TUNNELS,
ABERDEEN PROVING GROUND, MARYLAND,
20 MAY 1969, (U)
•SUPERSONIC WIND TUNNELS

CONTAMINANT PARTICLES AD-734 232
IN METAL-TO-METAL CLOSURES, (U)
•VALVES

A CONTINUATION OF THE AD-288 256
STUDY IN THE FIELD OF FLUID SEALS
FOR HIGH-SPEED ROTATING
EQUIPMENT (U)
•GASKETS

A CONTINUATION OF THE AD-288 840
STUDY IN THE FIELD OF FLUID SEALS
FOR HIGH-SPEED ROTATING
EQUIPMENT (U)
•OIL SEALS

A CONVENIENT AND AD-738 230
RELIABLE DEMOUNTABLE SEAL FOR LOW
TEMPERATURE WORK, (U)
•VACUUM SEALS

CRYOGENIC MATERIALS AD-713 820
DATA HANDBOOK (REVISED), VOLUME
II, SECTIONS D, E, F, G, H AND
I, (U)
•CRYOGENICS

CRYSTAL UNITS TYPE AD-283 498
CR(XN-11/11/11) (U)
•CRYSTAL HOLDERS

DESIGN ANALYSIS OF AD-431 961
BELLEVILLE WASHER SPRINGS, (U)
•GASKETS

DESIGN AND DEVELOPMENT AD-287 940
OF A 1000 P HYDRAULIC SYSTEM, PART
III, PHASE II INVESTIGATION (U)
•HYDRAULIC ACTUATORS

THE DESIGN OF DEEP- AD-729 643
SUBMERGENCE HYDROPHONES, (U)
•HYDROPHONES

DETERMINATION OF THE AD-406 307
MECHANISMS GOVERNING THE INFLOW OF

MOISTURE PAST A ROTARY SEAL -
THEORETICAL MODEL, (U)
•FIRE CONTROL SYSTEM COMPONENTS

DETERMINATION OF THE AD-406 308
MECHANISMS GOVERNING THE INFLOW OF
MOISTURE PAST A ROTARY SEAL, (U)
•TEST FACILITIES

DEVELOPMENT OF EXO- AD-265 775
REACTANT INORGANIC ADHESIVE
SYSTEM (U)
•ADHESIVES

DEVELOPMENT OF EXO- AD-265 776
REACTANT INORGANIC ADHESIVE
SYSTEM (U)
•ADHESIVES

DEVELOPMENT OF EXO- AD-271 429
REACTANT INORGANIC ADHESIVE
SYSTEM (U)
•ADHESIVES

DEVELOPMENT OF FASTENER AD-728 039
COUNTERSINK CORROSION PROTECTION
SEALS, (U)
•PLASTIC SEALS

DEVELOPMENT OF SEALS AD-601 033
FOR ADVANCED-DESIGN POLARIS
LAUNCHING SYSTEM, (U)
•GUIDED MISSILE LAUNCHERS

DEVELOPMENT OF SEALS AD-260 920
FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES (U)
•PNEUMATIC SYSTEMS

DEVELOPMENT OF SEALS AD-261 561
FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES (U)
•ELASTOMERS

DEVELOPMENT OF SEALS AD-261 562
FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES (U)
•RUBBER SEALS

DEVELOPMENT OF SEALS AD-261 563
FOR HIGH PRESSURE AIR SYSTEMS IN

T-2
UNCLASSIFIED

UNCLASSIFIED

DEV-ELA

SUBMARINES(U)
•RUBBER SEALS

DEVELOPMENT OF SEALS AD-261 869
FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES(U)
•RUBBER SEALS

DEVELOPMENT OF SEALS AD-267 121
FOR HIGH PRESSURE AIR SYSTEMS IN
SUBMARINES(U)
•PNEUMATIC SYSTEMS

DEVELOPMENT OF SOLVENT- AD-650 315
RESISTANT SEALANTS.(U)
•SEALS

DEVELOPMENT OF AD-256 218
SYNTHETIC RUBBER MATERIAL FOR
GASKETS AND PACKINGS IN DEEP
SUBMERGENCE SUB-MARINES(U)
•GASKETS

DEVELOPMENT OF AD-268 555
SYNTHETIC RUBBER MATERIAL FOR
GASKETS AND PACKINGS IN DEEP
SUBMERGENCE SUBMARINES(U)
•GASKETS

DEVICE FOR LUBRICATING AD-718 180
BEARINGS.(U)
•ANTIFRICTION BEARINGS

DIELECTRIC TO METAL AD-409 160
SEAL TECHNOLOGY STUDY.(U)
•DIELECTRICS

DIELECTRIC TO METAL AD-414 783
SEAL TECHNOLOGY STUDY.(U)
•MICROWAVE EQUIPMENT

THE DIFFERENTIATION OF AD-286 937
AN AVOIDANCE RESPONSE FROM AN
ESCAPE RESPONSE; A NOTE AND
CIRCUIT(U)
•LEARNING

DYNAMIC SHAFT SEALS IN AD-283 365
SPACE(U)
•ROTARY SEALS

DYNAMIC SHAFT SEALS IN AD-295 700
SPACE(U)
•ROTARY SEALS

DYNAMIC SHAFT SEALS IN AD-400 255
SPACE(U)
•ROTARY SEALS

DYNAMIC SHAFT SEALS IN AD-405 056
SPACE.(U)
•ROTARY SEALS

DYNAMIC SHAFT SEALS IN AD-423 319
SPACE.(U)
•ROTARY SEALS

DYNAMIC SHAFT SEALS IN AD-489 211
SPACE.(U)
•ROTARY SEALS

DYNAMIC SHAFT SEALS IN AD-432 064
SPACE.(U)
•ROTARY SEALS

DYNAMIC SHAFT SEALS IN AD-601 338
SPACE.(U)
•ROTARY SEALS

DYNAMIC SHAFT SEALS IN AD-603 655
SPACE.(U)
•SPACE PROPULSION

EFFECT OF SHELF AGING AD-430 759
ON MIL-P-5516 O-RINGS.(U)
•RUBBER

THE EFFECTS OF REACTOR AD-256 689
RADIATION ON ELASTOMERS AND
SEALANTS. III(U)
•ELASTOMERS

THE EFFECTS OF REACTOR AD-612 604
RADIATION ON THE PHYSICAL
PROPERTIES OF TWO
RADIATIONRESISTANT O-RING
COMPOUNDS.(U)
•O-RINGS

ELASTOMERIC SEALS AND AD-274 176
MATERIALS AT CRYOGENIC
TEMPERATURES(U)

T-3

UNCLASSIFIED

UNCLASSIFIED

END-AN

•ELASTOMERS

END SEALING OF A AD-621 011

SHAFT, (U)

•SHAFTS

ENGINEERING RESEARCH - AD-289 074

SEALING - METAL-FIBER COMPOSITE -

EVALUATION OF (U)

•FUEL SEALS

EPOXY VACUUM SEAL FOR AD-410 018

INTRODUCTION OF LEADS INTO

CRYOGENIC EQUIPMENT, (U)

•VACUUM SEALS

EVALUATION OF AD-422 466

ELASTOMERS AS O-RING SEALS FOR

LIQUID ROCKET FUEL AND OXIDIZER

SYSTEMS, (U)

•RUBBER SEALS

EVALUATION OF AD-607 240

ELASTOMERS AS O-RING SEALS FOR

LIQUID ROCKET FUEL AND OXIDIZER

SYSTEMS, (U)

•FUEL SEALS

AN EVALUATION OF THE AD-058 228

PERFORMANCE OF GAS CHECK GASKETS

FOR NAVAL PROJECTILES (U)

•GASKETS

EXPERIMENTAL AD-736 400

DETERMINATION OF THE COEFFICIENT OF

FRICTION DURING THE CONTACT OF A

SPHERE WITH A CONE, (U)

•VACUUM SEALS

AN EXPERIMENTAL STUDY AD-486 173

OF THE VISCOSEAL BEARING, (U)

•BEARINGS

EXPOSURE OF ELASTOMERS AD-697 029

TO HYDRAZINE AND AIR, WATER VAPOR,

OR CARBON DIOXIDE, (U)

•ELASTOMERS

2000F POWER WIRE FOR AD-602 144

AEROSPACE ENVIRONMENT, (U)

•METAL SEALS

FAIRPRENE INTEGRAL FUEL AD-292 287

TANK SEALING MATERIAL - SWELLING

CHARACTERISTICS OF, (U)

•AVIATION FUELS

GALVANIC CORROSION AD-635 592

BEHAVIOR OF WEAR-RESISTANT

MATERIALS FOR MECHANICAL SHAFT

SEALS, (U)

•METAL SEALS

GASKETING MEDIA AT AD-665 859

ULTRA-HIGH PRESSURE, (U)

•HIGH-PRESSURE RESEARCH

GASKETING MEDIA AT AD-665 860

ULTRA-HIGH PRESSURE, (U)

•HIGH-PRESSURE RESEARCH

GLASS HOLDER CRYSTAL AD-866 246

UNITS (U)

•CRYSTAL HOLDERS

GROSS LEAK HERMETICITY AD-729 876

TESTING ANALYSIS, (U)

•INTEGRATED CIRCUITS

HEAT SHRINKABLE TUBING AD-730 251

AS AN INEXPENSIVE VACUUM SEAL, (U)

•VACUUM SEALS

HERMETIC SEALS IN AD-659 676

PLASTIC BODIED CONNECTORS, (U)

•HERMETIC SEALS

HERMETICALLY SEALED AD-713 267

PUMPS IN NUCLEAR PROPULSION

PLANTS, (U)

•LIGHT WATER REACTORS

INSPECTION OF SH-1 AD-865 882

CONTROL ROD SEAL COMPONENTS (U)

•CONTROL RODS

INVESTIGATING FUEL- AD-665 374

ALCOHOL EFFECTS ON ELASTOMER

COMPONENTS OF DIESEL INJECTOR

SYSTEMS, (U)

•FUEL INJECTORS

AN INVESTIGATION AD-693 191

T-4

UNCLASSIFIED

UNCLASSIFIED

INV-PIL

INTERFACE STABILITY AND ITS
RELATION TO GAS INGESTION IN
VISCOSSEALS, (U)

•HYDRAULIC SEALS

INVESTIGATION OF AD-236 837
HYDRO-PNEUMATIC RECOIL MECHANISM
PACKING SPRING LOADS (U)

•GASKETS

INVESTIGATION OF AD-718 225
NONMETALLIC WATERSTOPS. REPORT 5.
WATER RETENTIVITY OF LABYRINTH-
SHAPED WATERSTOPS, (U)

•SEALS

INVESTIGATION OF AD-714 219
NONMETALLIC WATERSTOPS. REPORT 7.
PREPARATION OF LABORATORY TEST
SAMPLES FROM FINISHED
WATERSTOPS, (U)

•SEALS

INVESTIGATION OF AD-737 174
NONMETALLIC WATERSTOPS. REPORT 8.
EFFECT OF SPECIMEN SIZE AND LOW
TEMPERATURE ON WATERSTOP TEST
RESULTS, (U)

•JOINTS

INVESTIGATION OF SEAL AD-428 899
DESIGN AND SEALING TECHNIQUES FOR
KEL-F, TEFLON AND HALON, (U)

•HALOCARBON PLASTICS

LUBRICANTS, SEALANTS, AD-466 035
THREADING COMPOUNDS, PACKING AND
GASKETS FOR USE IN ABMA MISSILE
SYSTEMS, (U)

•LUBRICANTS

LUBRICATING COMPOSITION AD-721 032
FOR MERCURY WATER SEALS, (U)

•SEALS

MARINE THRUST AD-717 881

BEARING, (U)

•THRUST BEARINGS

MATERIAL-ACCESS DOOR AD-283 410

SEALANT-SCREENING AND EVALUATION OF-

(U)

•FUEL TANKS

MATERIAL - SEALANT - AD-286 230
FIREWALL - APPLICATION, PROCEDURES
AND PERFORMANCE OF (U)

•FUEL SEALS

MATERIAL - THIOKOL ST AD-286 237
RUBBER - PREFABRICATED FILLETS -
FOR INTEGRAL FUEL TANK SEALING -
TESTING OF (U)

•FUEL SEALS

METAL-TO-CERAMIC SEAL AD-248 535
TECHNOLOGY STUDY (U)

•CERAMIC MATERIALS

METALLIC BOSS SEAL AD-606 139
EVALUATION AND TEST PROGRAM, (U)

•METAL SEALS

METALLURGICAL RESEARCH AD-636 950
AND DEVELOPMENT FOR CERAMIC
ELECTRON DEVICES, (U)

•SEALS

METHOD OF INCREASING AD-713 038
THE WEAR RESISTANCE OF RUBBER
SEALS, (U)

•RUBBER SEALS

A METHOD OF PRODUCING A AD-644 038
HEAT-RESISTANT HERMETIC SEALER
BASED ON FLUORINE-RUBBER, (U)

•HERMETIC SEALS

METHOD OF PUMPING OF AD-656 564
VACUUM SYSTEMS, (U)

•VACUUM PUMPS

MODERATE PRECISION AD-410 654
GLASS ENCLOSED CRYSTAL UNITS, (U)

•RESONATORS

THE PHASE DIAGRAM FOR AD-235 831
THE BINARY SYSTEM
CADMIUM-TELLURIUM (U)

•CADMIUM

PILOT PRODUCTION OF AD-261 979

T-5

UNCLASSIFIED

UNCLASSIFIED

PIL>SEL

GLASS CRYSTAL HOLDERS (HC-1XM-2)/U;
HC-1XM-3)/U; HC-1XM-4)/U (U)
•CRYSTAL HOLDERS

PILOT PRODUCTION OF AD-271 118
GLASS CRYSTAL HOLDERS (HC-1XM-2)/U;
HC-1XM-3)/U; HC-1XM-4)/U (U)
•CRYSTAL HOLDERS

POSSIBLE USE OF AD-720 928
MATERIALS BASED ON
POLYTETRAFLUOROETHYLENE FOR PACKING
DRILLING PUMPS, (U)
•HALOCARBON PLASTICS

PRELIMINARY AD-259 803
INVESTIGATION OF SM-1 CONTROL ROD
SEAL FAILURE (U)
•CONTROL RODS

PRESSURE DAMS IN AD-698 685
COMMUNICATION CABLES, (U)
•TELEPHONE LINES

PRESSURE SEALING AD-658 204
CLOSURES FOR FULL PRESSURE
PROTECTIVE SUIT ASSEMBLIES, (U)
•PRESSURE SUITS

PRESSURIZED BOW DOKE OF AD-610 189
A CABLE-REINFORCED RUBBER
CONSTRUCTION FOR USE WITH AN/SOS-26
SONAR, (U)
•SONAR DOMES

PRODUCTION ENGINEERING AD-268 416
MEASURE FOR POLYOPTIC SEALING OF
HYDROGEN THYRATRON TUBES (U)
•GLASS SEALS

PRODUCTION ENGINEERING AD-272 338
MEASURE FOR POLYOPTIC SEALING OF
HYDROGEN THYRATRON TUBES (U)
•DEGASIFICATION

PRODUCTION ENGINEERING AD-282 892
MEASURE FOR POLYOPTIC SEALING OF
HYDROGEN THYRATRON TUBES (U)
•GLASS SEALS

PROPOSED MILITARY AD-424 301

SPECIFICATION GASKETS, HATCH SEAL O-
RING, OIL-RESISTANT RUBBER, (U)
•GASKETS

PROTECTION OF DSRV SEAL AD-731 356
SEAT SURFACES EXPOSED TO CYCLIC
PRESSURE IN SEAWATER, (U)
•STAINLESS STEEL

QUALIFICATION TEST AD-263 306
REPORT ON DODGE CORK COMPANY'S 711-
BN AND 100-N GASKET MATERIALS
TESTED IN ACCORDANCE WITH MIL-G-
6183, AMENDMENT-4, GASKETS AND
SHEET GASKET MATERIAL; SYNTHETIC
RUBBER AND CORK COMPOSITION, CLASS
I, FIRM AND CLASS II, MEDIUM,
RESPECTIVELY OF 22 AUGUST 1947 (U)
•GASKETS

RESEARCH ON HIGH AD-634 942
PRESSURE MEDIA, (U)
•HIGH-PRESSURE RESEARCH

SEAL SYSTEMS IN AD-643 582
HYDROSPACE, PHASE I, MECHANICAL
INTEGRITY OF FLANGE SEAL
SYSTEMS, (U)
•SEALS

SEAL SYSTEMS IN AD-684 080
HYDROSPACE, PHASE II, CYCLIC
LOADING OF FLANGE AND HATCH SEAL
SYSTEMS, (U)
•UNDERWATER VEHICLES

SEAL SYSTEMS IN AD-845 361
HYDROSPACE, PHASE III: EFFECTS OF
LONG TERM HYDROSPACE EXPOSURE ON
SEAL SYSTEM INTEGRITY, 189 DAYS AT
5,900 FEET, (U)
•UNDERWATER VEHICLES

SEALS FOR 12,500 PSIG AD-430 727
AIR SYSTEMS, (U)
•RUBBER SEALS

SELF-LUBRICATED AD-623 238
COMPOSITE MATERIALS FOR HIGH-
PRESSURE AIR SEALS (FILAMENT-WOUND
STRUCTURES), (U)

T-6
UNCLASSIFIED

UNCLASSIFIED

SEL-TRA

•COMPOSITE MATERIALS

SELF-LUBRICATED SEALS AD-627 230
DEVELOPMENT FOR HIGH-PRESSURE, OIL-
FREE COMPRESSORS. (U)
•SEALS (STOPPERS)

SELF-SEALING SCREW. (U) AD-724 992
•SCREWS

SILICONE-ASBESTOS AD-720 988
OBTURATOR PADS FOR 175MM GUN, M113A
1. A PRODUCT IMPROVEMENT. (U)
•BREECH MECHANISMS

A SIMPLE HIGH VOLTAGE AD-695 739
VACUUM SEAL. (U)
•VACUUM SEALS

A SIMPLE VACUUM SEAL AD-657 917
FOR NON-CIRCULAR TUBES. (U)
•O-RINGS

SOLDER-GLASS SEALING OF AD-613 837
MICROWAVE ANTENNA WINDOWS. (U)
•WAVEGUIDE WINDOWS

STATIC AND ROTATING AD-730 461
AIR/GAS SEAL EVALUATION. (U)
•GAS SEALS

STRUCTURAL DESIGN OF AD-710 380
CONICAL ACRYLIC VIEWPORTS. (U)
•UNDERWATER VEHICLES

A STUDY IN THE FIELD OF AD-290 411
FLUID SEALS FOR HIGH SPEED ROTATING
EQUIPMENT. (U)
•HYDRAULIC SEALS

A STUDY OF CONVECTIVE AD-709 120
INERTIA EFFECTS AND METHODS OF
CONTROLLING GAS INGESTION IN LARGE
DIAMETER VISCOSEALS. (U)
•HYDRAULIC SEALS

STUDY OF O-RING AGING AD-426 503
CHARACTERISTICS. (U)
•GASKETS

SUITABILITY OF VITON B AD-670 746

O-RINGS FOR USE IN 3000 PSI
HYDRAULIC SYSTEMS CONTAINING
PETROLEUM BASE FLUID OR CELLULOSE
220 (U)

•HYDRAULIC SEALS

SUITABILITY OF VITON B AD-260 965
O-RINGS FOR USE IN 3000 PSI
HYDRAULIC SYSTEMS CONTAINING
PETROLEUM BASE OR PHOSPHATE ESTER
FLUIDS (U)

•HYDRAULIC SEALS

SURVEILLANCE TESTS OF AD-299 393
MARK 15 POLARIS INTERTUBE SEALS (U)
•GUIDED MISSILE LAUNCHERS

A TECHNIQUE FOR THE AD-721 896
ALTERNATE FIRING AND CYCLING OF
CANNON TUBES. (U)
•GUN BARRELS

TESTS OF PARKER RING AD-258 893
SEAL FOR BUOY POCKETS (U)
•BUOYS

THEORETICAL AD-410 925
INVESTIGATION OF OIL BACKSTREAMING
THROUGH A VACUUM TRAP. (U)
•DIFFUSION PUMPS

THE THEORY OF PLANE AD-693 195
ELASTIC DEFORMATION APPLIED TO THE
COMPRESSION OF RUBBER SEALS. (U)
•O-RINGS

THERMOELASTIC AD-723 444
INSTABILITY OF FRICTIONAL
CONTACTS. (U)
•BEARINGS

TIGHTENING FLANGE AD-633 893
JOINTS BY MEANS OF HERMETICALLY
SEALING PLASTIC. (U)
•PLASTIC SEALS

TRAPPED RUBBER BLANKING AD-677 739
AND PIERCING PRODUCTION
EVALUATION. (U)
•RUBBER GASKETS

T-7
UNCLASSIFIED

UNCLASSIFIED

TUR-WIN

TURBULENCE AND INERTIA AD-730 723
EFFECTS IN THE ALIGNED FACE
SEAL, (U)
•SEALS

TWO-FLUID FLOWS IN FACE AD-706 841
SEALS, (U)
•ROTARY SEALS

ULTRA HIGH TEMPERATURE AD-284 989
DIELECTRIC EMBEDDING MATERIALS, (U)
•CERAMIC COATINGS

ULTRASONIC WELDING OF AD-708 934
PS117 COPPER THIMBLES, (U)
•FUZE FUNCTIONING ELEMENTS

VISCO-TYPE GAS AD-699 241
SEALING, (U)
•SHAFTS

WING AND FUSELAGE - AD-286 232
INTEGRAL FUEL TANK SEALANTS -
IMPROVED HIGH TEMPERATURE (275 F) -
PER MIL-S-8002 - EVALUATION OF, (U)
•FUEL SEALS

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T-8
UNCLASSIFIED

UNCLASSIFIED

PERSONAL AUTHOR INDEX

BARINUSHKIN, L. S.

END SEALING OF A SHAFT.
AD-421 011

BARAKES, C.

MEVALLURGICAL RESEARCH AND
DEVELOPMENT FOR CERAMIC ELECTRON-
DEVICES.
AD-632 850

BARNETT, A. E.

SUITABILITY OF VITON B O-RINGS FOR
USE IN 3000 PSI HYDRAULIC SYSTEMS
CONTAINING PETROLEUM BASE OR
PHOSPHATE ESTER FLUIDS.
AD-260 765

SURVEILLANCE TESTS OF MARK 15
POLARIS INTERTUBE SEALS
AD-297 393

BARNETT, A. E.

SEALS FOR 12,500 PSIG AIR SYSTEMS.
AD-430 727

EFFECT OF SHELF AGING ON MIL-P-5516
O-RINGS.
AD-430 759

BASSETT, WILLIAM

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM
AD-266 773

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM
AD-265 776

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM
AD-271 429

BELLANCA, CARMEN L.

EVALUATION OF ELASTOMERS AS O-RING
SEALS FOR LIQUID ROCKET FUEL AND

OXIDIZER SYSTEMS.

AD-422 466

EVALUATION OF ELASTOMERS AS O-RING
SEALS FOR LIQUID ROCKET FUEL AND
OXIDIZER SYSTEMS.
AD-407 240

BENNETT, R. E.

CRYSTAL UNITS TYPE CR(XN-11/0)
AD-283 498

BERUS, W. J.

PRESSURIZED BOX DOME OF A CABLE-
REINFORCED RUBBER CONSTRUCTION FOR
USE WITH AN/SQS-20 SONAR.
AD-410 189

BLALOCK, T. V.

BASIC RESEARCH IN DYNAMIC SEALING.
AD-732 021

BLOMQUIST, T. V.

SOLDER-GLASS SEALING OF MICROWAVE
ANTENNA WINDOWS.
AD-410 837

BOUDAKIAN, M. H.

DEVELOPMENT OF SOLVENT-RESISTANT
SEALANTS.
AD-650 315

BOUTHILLETTE, LIONEL O.

EPOXY VACUUM SEAL FOR INTRODUCTION
OF LEADS INTO CRYOGENIC EQUIPMENT.
AD-410 818

BROOKS, C. R.

BASIC RESEARCH IN DYNAMIC SEALING.
AD-732 021

BROWN, BRUCE B.

A TECHNIQUE FOR THE ALTERNATE

UNCLASSIFIED

ERO-COL

FINING AND CYCLING OF CANNON TUBES,
AD-721 898

BROWN, GARY G.

PRESSURE SEALING CLOSURES FOR FULL
PRESSURE PROTECTIVE SUIT
ASSEMBLIES.
AD-686 204

BRYANT, CAROL

CRYOGENIC MATERIALS DATA HANDBOOK
(REVISED), VOLUME 11, SECTIONS D,
E, F, G, H AND I.
AD-713 620

BURTON, RALPH A.

THERMOELASTIC INSTABILITY OF
FRICTIONAL CONTACTS.
AD-726 444

DEADWALLADER, T.C.

THE DIFFERENTIATION OF AN AVOIDANCE
RESPONSE FROM AN ESCAPE RESPONSE: A
NOTE AND CIRCUIT
AD-286 937

CANNIZZARO, S.

METALLIC BOSS SEAL EVALUATION AND
TEST PROGRAM.
AD-606 139

CARROLL, H.T.

ENGINEERING RESEARCH - SEALING -
METAL-FIBER COMPOSITE - EVALUATION
OF
AD-289 074

CAUGHEY, ROBERT

DEVELOPMENT OF EPO-REACTANT
INORGANIC ADHESIVE SYSTEM
AD-271 429

CHAPEL, R.E.

A CONTINUATION OF THE STUDY IN THE
FIELD OF FLUID SEALS FOR HIGH-SPEED
ROTATING EQUIPMENT
AD-268 256

A CONTINUATION OF THE STUDY IN THE
FIELD OF FLUID SEALS FOR HIGH-SPEED
ROTATING EQUIPMENT
AD-268 540

A STUDY IN THE FIELD OF FLUID SEALS
FOR HIGH SPEED ROTATING EQUIPMENT
AD-290 611

CHATHAN, T.K.

AN EVALUATION OF THE PERFORMANCE OF
GAS CHECK GASKETS FOR NAVAL
PROJECTILES
AD-055 228

CHEATHAN, E.

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-285 106

CHEATHAN, E.

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES.
AD-404 008

CHITTUN, R.A.

INSPECTION OF SH-1 CONTROL ROD SEAL
COMPONENTS
AD-265 582

COLACICCO, E.J.

QUALIFICATION TEST REPORT ON DODGE
CORK COMPANY'S 711-BN AND 700-W
GASKET MATERIALS TESTED IN
ACCORDANCE WITH MIL-G-6183,
AMENDMENT-4, GASKETS AND SHEET
GASKET MATERIAL, SYNTHETIC RUBBER
AND CORK COMPOSITION, CLASS I,
FIRM AND CLASS II, MEDIUM,
RESPECTIVELY OF 22 AUGUST 1947
AD-843 306

P-2
UNCLASSIFIED

UNCLASSIFIED

COL-FIS

• COLE, B.

• • •
CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-404 080

• COLE, S. S. JR.

• • •
METAL-TO-CERAMIC SEAL TECHNOLOGY
STUDY
AD-292 535

• • •
CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-236 130

• CURRY, JAMES E.

• • •
LUBRICANTS, SEALANTS, THREADING
COMPOUNDS, PACKING AND GASKETS FOR
USE IN ABMA MISSILE SYSTEMS,
AD-966 035

• DENAULT, GENEVIEVE C.

• • •
EXPOSURE OF ELASTOMERS TO HYDRAZINE
AND AIR, WATER VAPOR, OR CARBON
DIOXIDE,
AD-498 029

• DIXON, G. H.

• • •
PRODUCTION ENGINEERING MEASURE FOR
POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES
AD-272 330

• • •
PRODUCTION ENGINEERING MEASURE FOR
POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES
AD-282 892

• DON, THOMAS A.

• • •
THERMOELASTIC INSTABILITY OF
FRICTIONAL CONTACTS,
AD-726 444

• DOWNS, FREDERICK L.

• • •
DEVELOPMENT OF SYNTHETIC RUBBER

MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUB-MARINES
AC-236 210

• DRING, H. L.

• • •
CERAMIC TO METAL SEALS FOR HIGH-
TEMPERATURE THERMIONIC CONVERTERS
AD-274 155

• EDMONDSON, A. J.

• • •
BASIC RESEARCH IN DYNAMIC SEALING,
AD-732 021

• ENLERS, F. EDWARD

• • •
THE THEORY OF PLANE ELASTIC
DEFORMATION APPLIED TO THE
COMPRESSION OF RUBBER SEALS,
AD-693 195

• ELOVICH, I. I.

• • •
LUBRICATING COMPOSITION FOR MERCURY
WATER SEALS,
AD-721 032

• FARRELL, JOHN P.

• • •
GROSS LEAK HERMETICITY TESTING
ANALYSIS,
AD-729 876

• FEDOROVA, V. G.

• • •
A METHOD OF PRODUCING A HEAT-
RESISTANT HERMETIC SEALER BASED ON
FLUORINE-RUBBER,
AD-644 030

• FERELLO, A. S.

• • •
CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-275 082

• FISHER, C. F., JR.

• • •
BASIC RESEARCH IN DYNAMIC SEALING,
AD-732 021

P-3
UNCLASSIFIED

UNCLASSIFIED

FIS-HAR

FISHER, CHARLES F., JR

AN INVESTIGATION INTERFACE
STABILITY AND ITS RELATION TO GAS
INGESTION IN VISCOSSEALS.
AD-693 191

FORD, R.D

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-268 920

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 561

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 562

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 563

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 564

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 565

SUITABILITY OF VITON B O-RINGS FOR
USE IN 3000 PSI HYDRAULIC SYSTEMS
CONTAINING PETROLEUM BASE FLUID OR
CELLULOSE 220
AD-270 746

FREDERICKS, W. J.

A SIMPLE VACUUM SEAL FOR NON-
CIRCULAR TUBES.
AD-657 917

GRINN, A.C.

DIELECTRIC TO METAL SEAL TECHNOLOGY
STUDY.
AD-409 160

DIELECTRIC TO METAL SEAL TECHNOLOGY
STUDY.

AD-419 783

GROVES, IVON D., JR

THE DESIGN OF DEEP-SUBMERGENCE
HYDROPHONES.
AD-729 643

HAGLER, H. O.

HEAT SHRINKABLE TUBING AS AN
INEXPENSIVE VACUUM SEAL.
AD-730 251

HALL, L.E

A CONTINUATION OF THE STUDY IN THE
FIELD OF FLUID SEALS FOR HIGH-SPEED
ROTATING EQUIPMENT
AD-288 256

A STUDY IN THE FIELD OF FLUID SEALS
FOR HIGH SPEED ROTATING EQUIPMENT
AD-290 611

HALLIWELL, HARRY

SELF-LUBRICATED COMPOSITE MATERIALS
FOR HIGH-PRESSURE AIR SEALS
(FILAMENT-WOUND STRUCTURES).
AD-633 238

HAMMER, HELVIN O

MODERATE PRECISION GLASS ENCLOSED
CRYSTAL UNITS.
AD-413 654

HANOK, H

COMPOUNDING DEVELOPMENT OF
ELASTOMERS FOR GASKETS FOR
SUBMARINE HIGH PRESSURE AIR AND
OXYGEN SYSTEMS
AD-285 966

HARKEN, G.B

THE DIFFERENTIATION OF AN AVOIDANCE

P-4
UNCLASSIFIED

UNCLASSIFIED

NAR-10A

RESPONSE FROM AN ESCAPE RESPONSE: A
NOYE AND CIRCUIT
AD-286 937

HARRIS, JAY C.

EVALUATION OF ELASTOMERS AS O-RING
SEALS FOR LIQUID ROCKET FUEL AND
OXIDIZER SYSTEMS.
AD-607 240

HARRIS, JAY C.

EVALUATION OF ELASTOMERS AS O-RING
SEALS FOR LIQUID ROCKET FUEL AND
OXIDIZER SYSTEMS.
AD-422 466

HEITZ, ROGER H.

PRESSURE SEALING CLOSURES FOR FULL
PRESSURE PROTECTIVE SUIT
ASSEMBLIES.
AD-658 204

HESS, L. G.

COMPOUNDING DEVELOPMENT OF
ELASTOMERS FOR GASKETS FOR
SUBMARINE HIGH PRESSURE AIR AND
OXYGEN SYSTEMS
AD-285 966

HIEGEL, ARTHUR F.

BEARING AND SEAL TECHNOLOGY REVIEW.
AD-729 338

HODGSON, J. W.

VISCO-TYPE GAS SEALING,
AD-697 291

HOFFMAN, BERNARD

DETERMINATION OF THE MECHANISMS
GOVERNING THE INFLOW OF MOISTURE
PAST A ROTARY SEAL - THEORETICAL
MODEL.
AD-406 307

HOFFMAN, H. C.

MATERIAL - THLOKOL ST RUBBER -
PREFABRICATED FILLETS - FOR
INTEGRAL FUEL TANK SEALING -
TESTING OF
AD-286 237

HOLKEBOEK, D. H.

THEORETICAL INVESTIGATION OF OIL
BACKSTREAMING THROUGH A VACUUM
TRAP.
AD-410 923

HORNER, RICHARD F.

COMPONENT IMPROVEMENT PROGRAM FOR
AIRCRAFT BRAKE PISTON SEALS.
AD-728 216

HUSTON, BILLY J.

INVESTIGATION OF NONMETALLIC
WATERSTOPS. REPORT 7. PREPARATION
OF LABORATORY TEST SAMPLES FROM
FINISHED WATERSTOPS.
AD-714 219

INVESTIGATION OF NONMETALLIC
WATERSTOPS; REPORT 5. WATER
RETENTIVITY OF LABYRINTH-SHAPED
WATERSTOPS.
AD-710 226

INVESTIGATION OF NONMETALLIC
WATERSTOPS. REPORT 8. EFFECT OF
SPECIMEN SIZE AND LOW TEMPERATURE
ON WATERSTOP TEST RESULTS.
AD-737 174

HYNES, JAMES T.

SILICONE-ASBESTOS OBSTURATOR PADS
FOR 175MM GUN, M113A 1, A PRODUCT
IMPROVEMENT.
AD-720 988

IWATSUKI, F.

COMPOSITE INORGANIC RESILIENT SEAL

P-3
UNCLASSIFIED

UNCLASSIFIED

JEN-KHI

MATERIALS
AD-291 984

•JENKINS, JAMES F.

SEAL SYSTEMS IN HYDROSPACE, PHASE
II. CYCLIC LOADING OF FLANGE AND
HATCH SEAL SYSTEMS.

AD-684 080

PROTECTION OF DSRV SEAL SEAT
SURFACES EXPOSED TO CYCLIC PRESSURE
IN SEAWATER.

AD-731 356

SEAL SYSTEMS IN HYDROSPACE, PHASE
I. MECHANICAL INTEGRITY OF FLANGE
SEAL SYSTEMS.

AD-843 582

SEAL SYSTEMS IN HYDROSPACE, PHASE
IIII EFFECTS OF LONG TERM
HYDROSPACE EXPOSURE ON SEAL SYSTEM
INTEGRITY, 189 DAYS AT 3,900 FEET.

AD-865 261

•JOHNSON, C

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES

AD-285 106

•JOHNSON, C.

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES.

AD-404 088

•JOHNSON, E.

HERMETIC SEALS IN PLASTIC BODIED
CONNECTORS.

AD-659 676

•JOHNSON, P. M.

THE EFFECTS OF REACTOR RADIATION ON
THE PHYSICAL PROPERTIES OF TWO
RADIATION-RESISTANT O-RING
COMPOUNDS.

AD-612 604

•JONES, O. W.

THEORETICAL INVESTIGATION OF OIL
BACKSTREAMING THROUGH A VACUUM
TRAP.

AD-410 925

•JOYCE, W. G.

MATERIAL - SEALANT - FIREWALL -
APPLICATION, PROCEDURES AND
PERFORMANCE OF

AD-286 230

•JUSTI, O. J.

SURVEILLANCE TESTS OF MARK 15
POLARIS INTERTUBE SEALS

AD-299 393

•KATONA, H. G.

STRUCTURAL DESIGN OF CONICAL
ACRYLIC VIEWPORTS.

AD-710 350

•KELLY, G. W.

DEVELOPMENT OF FASTENER COUNTERSINK
CORROSION PROTECTION SEALS.

AD-728 039

•KILLELEA, JOHN R.

GROSS LEAK HERMETICITY TESTING
ANALYSIS.

AD-729 876

•KNIGHT, MARVIN

CRYOGENIC MATERIALS DATA HANDBOOK
(REVISED), VOLUME II. SECTIONS D,
E, F, G, H AND I.

AD-713 620

•KNIGHTON, G. W.

PRELIMINARY INVESTIGATION OF SH-1
CONTROL ROD SEAL FAILURE

AD-239 803

P-2

UNCLASSIFIED

UNCLASSIFIED

KRI-LUT

• KRISTIANSEN, H. • • •

HEAT SHRINKABLE TUBING AS AN
INEXPENSIVE VACUUM SEAL.

AD-730 251

• KULIEV, A. H. • • •

LUBRICATING COMPOSITION FOR MERCURY
WATER SEALS.

AD-721 032

• KULWICKI, BERNARD H. • • •

THE PHASE DIAGRAM FOR THE BINARY
SYSTEM CADMIUM-TELLURIUM

AD-235 031

• KUZNETSOV, S. A. • • •

MARINE THRUST BEARING,

AD-717 001

• LAFIN, B. G. • • •

MARINE THRUST BEARING,

AD-717 001

• LARISCH, H. W. • • •

METAL-TO-CERAMIC SEAL TECHNOLOGY
STUDY

AD-246 535

• LEPERA, H. E. • • •

INVESTIGATING FUEL-ALCOHOL EFFECTS
ON ELASTOMER COMPONENTS OF DIESEL
INJECTOR SYSTEMS.

AD-665 374

• LEVSHINA, A. H. • • •

LUBRICATING COMPOSITION FOR MERCURY
WATER SEALS.

AD-721 032

• LEWIS, J. H. • • •

THE EFFECTS OF REACTOR RADIATION ON
THE PHYSICAL PROPERTIES OF TMO

RADIATION RESISTANT O-RING
COMPOUNDS.

AD-612 609

• LIBERMAN, L. H. • • •

SELF-SEALING SCREW,

AD-729 992

• LIPSETT, F. R. • • •

COLD WELDED INDIUM LOW TEMPERATURE
WINDOW SEAL,

AD-633 296

• LIPSON, HERBERT G. • • •

EPOXY VACUUM SEAL FOR INTRODUCTION
OF LEADS INTO CRYOGENIC EQUIPMENT,

AD-410 010

• LIVESAY, B. J. • • •

A CONTINUATION OF THE STUDY IN THE
FIELD OF FLUID SEALS FOR HIGH-SPEED
ROTATING EQUIPMENT

AD-260 256

• LONG, ROGER A. • • •

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM

AD-265 775

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM

AD-265 776

DEVELOPMENT OF EXO-REACTANT
INORGANIC ADHESIVE SYSTEM

AD-271 929

• LUBENETS, V. D. • • •

DEVICE FOR LUBRICATING BEARINGS,

AD-710 100

• LUTYHULL, LAWRENCE HOWARD • • •

A STUDY OF CONVECTIVE INERTIA
EFFECTS AND METHODS OF CONTROLLING

P-7
UNCLASSIFIED

HAC-MOR

UNCLASSIFIED

GAS INGESTION IN LARGE DIAMETER
VISCOSSEALS,
AD-707 160

• MACKENZIE, K. R. • • •

A SIMPLE HIGH VOLTAGE VACUUM SEAL,
AD-695 739

• MARK, H. • • •

FAIRPRENE INTEGRAL FUEL TANK
SEALING MATERIAL - SWELLING
CHARACTERISTICS OF,
AD-292 207

• MARSH, PETER A. • • •

EXPOSURE OF ELASTOMERS TO HYDRAZINE
AND AIR, WATER VAPOR, OR CARBON
DIOXIDE,
AD-695 029

• MARSHALL, J. D. • • •

7406 CERAMIC TRIODE, PRODUCTION
ENGINEERING MEASURE,
AD-429 993

• MARTINSON, E. N. • • •

METHOD OF PUMPING OF VACUUM
SYSTEMS,
AD-656 564

• MASON, DONALD R. • • •

THE PHASE DIAGRAM FOR THE BINARY
SYSTEM CADMIUMTELLURIUM
AD-236 831

• MASTERSON, J. S. • • •

PRESSURE DAMS IN COMMUNICATION
CABLES,
AD-698 605

• MAYHEW, WILLIAM E. • • •

DESIGN AND DEVELOPMENT OF A 1000 P
HYDRAULIC SYSTEM, PART III, PHASE

II. INVESTIGATION

AD-237 940

• MCCLINDEN, J. E. • • •

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-266 158

• MCRAE, R. • • •

METALLURGICAL RESEARCH AND
DEVELOPMENT FOR CERAMIC ELECTRON
DEVICES,
AD-636 950

• MIASCHI, BRUNO • • •

A CABLE GLAND FOR DEEP-SEA
OPERATION,
AD-870 494

• MICKEVICZ, E. J. • • •

AN EVALUATION OF THE PERFORMANCE OF
GAS CHECK GASKETS FOR NAVAL
PROJECTILES
AD-055 228

• MILLIGAN, M. W. • • •

VISCO-TYPE GAS SEALING,
AD-699 291

• MOLEN, G. H. • • •

HEAT SHRINKABLE TUBING AS AN
INEXPENSIVE VACUUM SEAL,
AD-730 251

• MORGAN, L. L. • • •

THE EFFECTS OF REACTOR RADIATION ON
ELASTOMERS AND SEALANTS, III
AD-256 689

• MORRIS, R. E. • • •

DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 561

P-8

UNCLASSIFIED

UNCLASSIFIED

NOR-PLC

• • •
DEVELOPMENT OF SEALS FOR HIGH
PRESSURE AIR SYSTEMS IN SUBMARINES
AD-261 569

• MORROW, R. B.

• • •
A CONTINUATION OF THE STUDY IN THE
FIELD OF FLUID SEALS FOR HIGH-SPEED
ROTATING EQUIPMENT
AD-268 590

• MOTA, ANA CELIA

• • •
A CONVENIENT AND RELIABLE
DEMOUNTABLE SEAL FOR LOW
TEMPERATURE WORK,
AD-735 230

• MURPHY, J. A.

• • •
CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-277 427

• MURPHY, J. P.

• • •
TRAPPED RUBBER BLANKING AND
PIERCING PRODUCTION EVALUATION,
AD-677 734

• CHAU, C. S.

• • •
APPLIED RESEARCH ON A HERMETICALLY-
SEALED DRIVE COUPLING FOR SPACE
POWER TRANSMISSION
AD-282 710

• NIKITIN, YU P.

• • •
DEVICE FOR LUBRICATING BEARINGS,
AD-719 180

• OKAMOTO, Y.

• • •
RESEARCH ON HIGH PRESSURE MEDIA,
AD-638 942

• OKAMOTO, YOSHIYUKI

• • •
GASKETING MEDIA AT ULTRA-HIGH

PRESSURE,
AD-665 869

• • •
GASKETING MEDIA AT ULTRA-HIGH
PRESSURE,
AD-665 860

• OSGOOD, SAMUEL H.

• • •
CRYOGENIC MATERIALS DATA HANDBOOK
(REVISED), VOLUME II, SECTIONS D,
E, F, G, H AND I,
AD-713 620

• PALADINI, W.

• • •
STATIC AND ROTATING AIR/GAS SEAL
EVALUATION,
AD-730 361

• PANFILOV, E. A.

• • •
DEVICE FOR LUBRICATING BEARINGS,
AD-719 180

• PERSHIN, P. P.

• • •
EXPERIMENTAL DETERMINATION OF THE
COEFFICIENT OF FRICTION DURING THE
CONTACT OF A SPHERE WITH A CONE,
AD-736 400

• PETERSON, J. J.

• • •
ABSTRACTS OF MATERIAL EVALUATION
PROGRAMS CONDUCTED AT CHANCE VUGHT
CORPORATION
AD-272 888

• PISZKO, JOHN J.

• • •
INVESTIGATION OF SEAL DESIGN AND
SEALING TECHNIQUES FOR KEL-F,
TEFLON AND HALON,
AD-428 599

• PLECHEV, V. I.

• • •
METHOD OF PUMPING OF VACUUM
SYSTEMS,
AD-656 564

P-7
UNCLASSIFIED

UNCLASSIFIED

POL-RE1

*POLINOVSKI, A. YU.

END SEALING OF A SHAFT,
AD-641 011

*POTUSHANSKI, A. A.

POSSIBLE USE OF MATERIALS BASED ON
POLYTETRAFLUOROETHYLENE FOR PACKING
DRILLING PUMPS,
AD-720 928

*PRICE, H. N.

MATERIAL-ACCESS DOOR SEALANT-
SCREENING AND EVALUATION OF-
AD-282 410

WING AND FUSELAGE - INTEGRAL FUEL
TANK SEALANTS - IMPROVED HIGH
TEMPERATURE (275 F) - PER MIL-S-
8802 - EVALUATION OF,
AD-284 232

*PRINCE, H.

RESEARCH ON HIGH PRESSURE MEDIA,
AD-636 992

*PRINCE, MARTIN

GASKETING MEDIA AT ULTRA-HIGH
PRESSURE,
AD-645 859

GASKETING MEDIA AT ULTRA-HIGH
PRESSURE,
AD-645 860

*PRITCHARD, D. J.

ENGINEERING RESEARCH - SEALING -
METAL-FIBER COMPOSITE - EVALUATION
OF
AD-289 074

*PROGAN, V. D.

EXPERIMENTAL DETERMINATION OF THE
COEFFICIENT OF FRICTION DURING THE
CONTACT OF A SPHERE WITH A CONE,

AD-736 400

*RAES, W. C.

DEVELOPMENT OF SOLVENT-RESISTANT
SEALANTS,
AD-650 315

*RAISBECK, L. R.

INVESTIGATION OF HYDRO-PNEUMATIC
RECOIL MECHANISM PACKING-SPRING
LOADS
AD-236 637

*RAZDROGIN, YU. V.

TIGHTENING FLANGE JOINTS BY MEANS
OF HERMETICALLY SEALING PLASTIC,
AD-633 895

*RAZDAN, M. A.

CENTRIFUGAL SEALING OF A ROTATING
SHAFT,
AD-623 210

*REED, L.

METALLURGICAL RESEARCH AND
DEVELOPMENT FOR CERAMIC ELECTRON
DEVICES,
AD-636 950

*REINHART, FRED H.

SEAL SYSTEMS IN HYDROSPACE, PHASE
II. CYCLIC LOADING OF FLANGE AND
MATCH SEAL SYSTEMS,
AD-684 080

PROTECTION OF DSRV SEAL BEAT
SURFACES EXPOSED TO CYCLIC PRESSURE
IN SEAWATER,
AD-731 356

SEAL SYSTEMS IN HYDROSPACE, PHASE
I. MECHANICAL INTEGRITY OF FLANGE
SEAL SYSTEMS,
AD-643 582

P-10
UNCLASSIFIED

UNCLASSIFIED

REK-SHA

SEAL SYSTEMS IN HYDROSPACE, PHASE
1-3: EFFECTS OF LONG TERM
HYDROSPACE EXPOSURE ON SEAL SYSTEM
INTEGRITY. 189 DAYS AT 5,000 FEET.
AD-868 241

• GRELIS, ERNEST F.

• • •
COMPRESSOR AIR SEAL FAILURE,
SUPERSONIC WIND TUNNELS, ABERDEEN
PROVING GROUND, MARYLAND, 20 MAY
1969.
AD-699 215

• GREFIN, H. V.

• • •
CLUTCH FOR TRANSMITTING ROTARY
MOTION INTO AN AIR-TIGHT HOUSING.
AD-622 373

• GROBBINS, R. F.

• • •
ELASTOMERIC SEALS AND MATERIALS AT
CRYOGENIC TEMPERATURES
AD-274 176

• GRODNEY, STANLEY

• • •
ULTRA HIGH TEMPERATURE DIELECTRIC
EMBEDDING MATERIALS
AD-288 289

• GRONAMENKO, N. Y.

• • •
DEVICE FOR LUBRICATING BEARINGS.
AD-716 100

• GROSLAND, L. G.

• • •
HEAT SHRINKABLE TUBING AS AN
INEXPENSIVE VACUUM SEAL,
AD-730 251

• GRUNYANVIEV, O. V.

• • •
EXPERIMENTAL DETERMINATION OF THE
COEFFICIENT OF FRICTION DURING THE
CONTACT OF A SPHERE WITH A CONE,
AD-736 400

• SACCOGIO, R. H.

• • •
INSPECTION OF SN-1 CONTROL ROD SEAL
COMPONENTS
AD-245 582

• SADOVSKY, H. A.

• • •
ANALYTIC DEVELOPMENT OF DESIRABLE
STRESS DISTRIBUTION CHARACTERISTICS
IN SEALING RINGS LEADING TO
RECOMMENDATION OF RING NO. 5 FOR
APPLICATION TO CLOSED GREECH
LAUNCHERS
AD-239 509

• SALTER, IVAL O.

• • •
EVALUATION OF ELASTOMERS AS O-RING
SEALS FOR LIQUID ROCKET FUEL AND
OXIDIZER SYSTEMS.
AD-422 466

• • •
EVALUATION OF ELASTOMERS AS O-RING
SEALS FOR LIQUID ROCKET FUEL AND
OXIDIZER SYSTEMS.
AD-607 240

• SCHLAPBACH, H. E.

• • •
A STUDY IN THE FIELD OF FLUID SEALS
FOR HIGH SPEED ROTATING EQUIPMENT
AD-290 611

• SCHWARTZBERG, FRED H.

• • •
CRYOGENIC MATERIALS DATA HANDBOOK
(REVISED), VOLUME II, SECTIONS D,
E, F, G, H AND I.
AD-713 620

• SELF, H. R.

• • •
THE EFFECTS OF REACTOR RADIATION ON
THE PHYSICAL PROPERTIES OF TWO
RADIATION RESISTANT O-RING
COMPOUNDS,
AD-612 604

• SHAH, CHANDRAKANT KHUMAJI

• • •
AN EXPERIMENTAL STUDY OF THE

P-11
UNCLASSIFIED

UNCLASSIFIED

SIN-SW1

VISCOSEAL BEARING,
AD-486 175

*SHEV, N. H.

HERMETICALLY SEALED PUMPS IN
NUCLEAR PROPULSION PLANTS,
AD-718 267

*SMITH, L. L.

COMPOSITE INORGANIC RESILIENT SEAL
MATERIALS
AD-291 984

*SNAPP, RALPH D.

AN ANALYTICAL STUDY OF THIN FLUID
FILMS IN FACETED SHAFT SEALS,
AD-460 741

*SNOEY, M. R.

STRUCTURAL DESIGN OF CONICAL
ACRYLIC VIEWPOINTS,
AD-710 350

*STYOPK, C. R.

GLASS HOLDER CRYSTAL UNITS
AD-267 246

*SPRING, Y. R.

CONTAMINANT PARTICLES IN METAL-TO-
METAL CLOSURES,
AD-734 234

*STAIR, W. K.

BASIC RESEARCH IN DYNAMIC SEALING,
AD-772 021

*STEPANOVA, V. B.

A METHOD OF PRODUCING A HEAT-
RESISTANT HERMETIC SEALER BASED ON
FLUORINE-RUBBER,
AD-648 038

*STUBBART, P. D.

DIELECTRIC TO METAL SEAL TECHNOLOGY
STUDY,
AD-409 160

DIELECTRIC TO METAL SEAL TECHNOLOGY
STUDY,
AD-419 783

*STYHR, K.

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES,
AD-404 060

*STYHR, K. H.

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-275 082

*STYHR, K. JR.

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-277 427

*SULEIMANOVA, F. G.

LUBRICATING COMPOSITION FOR MERCURY
WATER SEALS,
AD-721 032

*SWIESKOWSKI, M. P.

DESIGN ANALYSIS OF BELLEVILLE
WASHER SPRINGS,
AD-431 961

*SWIFT, RILLY H.

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUB-MARINES
AD-256 210

DEVELOPMENT OF SYNTHETIC RUBBER
MATERIAL FOR GASKETS AND PACKINGS
IN DEEP SUBMERGENCE SUBMARINES
AD-265 883

UNCLASSIFIED

TAK-WAH

*TAKIHOTO, NIDEYO H.

EXPOSURE OF ELASTOMERS TO HYDRAZINE
AND AIR, WATER VAPOR, OR CARBON
DIOXIDE,
AD-692 029

*TELLIER, G. F.

CONTAMINANT PARTICLES IN METAL-TO-
METAL CLOSURES.
AD-734 232

*TENENBAUM, H. H.

METHOD OF INCREASING THE WEAR
RESISTANCE OF RUBBER SEALS,
AD-713 038

*TERKEL, A. L.

DEVICE FOR LUBRICATING BEARINGS,
AD-718 180

*THOMAS, JOHN G.

ULTRASONIC WELDING OF PS117 COPPER
THIMBLES,
AD-700 934

*TROYANER, B. S.

CENTRIFUGAL SEALING OF A ROTATING
SHAFT,
AD-623 210

*TSEITLIN, N. I.

CLUTCH FOR TRANSMITTING ROTARY
MOTION INTO AN AIR-TIGHT HOUSING,
AD-622 373

*TSONIS, C.

THEORETICAL INVESTIGATION OF OIL
BACKSTREAMING THROUGH A VACUUM
TRAP,
AD-410 925

*UDOVICHENKO, P. H.

HERMETICALLY SEALED PUMPS IN
NUCLEAR PROPULSION PLANTS,
AD-713 267

*URS, S. V.

DEVELOPMENT OF SOLVENT-RESISTANT
SEALANTS,
AD-650 315

*VEDENEVA, L. YA.

LUBRICATING COMPOSITION FOR MERCURY
WATER SEALS,
AD-721 032

*VERONIS, H. YA.

SELF-SEALING SCREW,
AD-724 992

*VOGEL, C. A.

INVESTIGATING FUEL-ALCOHOL EFFECTS
ON ELASTOMER COMPONENTS OF DIESEL
INJECTOR SYSTEMS,
AD-665 374

*VOGEL, S.

METALLURGICAL RESEARCH AND
DEVELOPMENT FOR CERAMIC ELECTRON
DEVICES,
AD-636 950

*VREZLAND, D. C.

GALVANIC CORROSION BEHAVIOR OF WEAR-
RESISTANT MATERIALS FOR MECHANICAL
SHAFT SEALS,
AD-635 592

*WADE, W.

METALLURGICAL RESEARCH AND
DEVELOPMENT FOR CERAMIC ELECTRON
DEVICES,
AD-636 950

*WARAKSA, I

P-13
UNCLASSIFIED

UNCLASSIFIED

WAR-2WE

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-278 427

•WARASKA, I

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES
AD-285 106

•WARASKA, I.

CERAMIC-METAL SEALS FOR HIGH-POWER
TUBES.
AD-404 068

•WARD, J. R.

SELF-LUBRICATED COMPOSITE MATERIALS
FOR HIGH-PRESSURE AIR SEALS
(FILAMENT-WOUND STRUCTURES).
AD-633 238

•WARD, JOHN R.

SELF-LUBRICATED SEALS DEVELOPMENT
FOR HIGH-PRESSURE, OIL-FREE
COMPRESSORS.
AD-622 230

•WATROUS, WARD W

PRODUCTION ENGINEERING MEASURE FOR
POLYOPTIC SEALING OF HYDROGEN
THYRATRON TUBES
AD-268 414

•WEITZEL, D. H

ELASTOMERIC SEALS AND MATERIALS AT
CRYOGENIC TEMPERATURES
AD-278 176

•WELSH, F. H

A CONTINUATION OF THE STUDY IN THE
FIELD OF FLUID SEALS FOR HIGH-SPEED
ROTATING EQUIPMENT
AD-288 540

•WHITNEY, R. K

PILOT PRODUCTION OF GLASS CRYSTAL
HOLDERS (HC-(XN-2)/U; HC-(XN-3)/U;
HC-(XN-4)/U)
AD-261 979

PILOT PRODUCTION OF GLASS CRYSTAL
HOLDERS (HC-(XN-2)/U; HC-(XN-3)/U;
HC-(XN-4)/U)
AD-271 918

•WILHELM, LUTHER R.

TURBULENCE AND INERTIA EFFECTS IN
THE ALIGNED FACE SEAL.
AD-730 723

•YANSON, V. H.

SELF-SEALING SCREW,
AD-724 942

•ZAPRIVODA, A. I.

METHOD OF INCREASING THE WEAR
RESISTANCE OF RUBBER SEALS.
AD-713 038

•ZIRIN, LOUIS I.

BEARING AND SEAL SCALABILITY STUDY.
AD-729 329

•ZWEIG, JOHN E.

TWO-FLUID FLOWS IN FACE SEALS.
AD-706 841

P-14
UNCLASSIFIED

AD-NUMBER INDEX

AD-NUMBER	PAGE	AD NUMBER	PAGE
055 228	13	292 287	161
235 831	65	294 155	41
236 837	14- 45	295 700	131
239 509	1	299 393	162
248 535	66	400 255	132
256 218	15	404 088	80
256 689	151	405 056	133
257 940	46	406 307	134
258 893	16- 67-152	406 308	135
259 803	68	409 160	81
260 465	47	410 018	111
260 920	153	410 925	94
261 561	154	413 654	42
261 562	155	419 783	82
261 563	156	422 466	163
261 564	157	423 319	136
261 979	33	424 301	21- 95
263 306	17	426 505	22
265 555	18	428 599	112
265 582	69	429 211	137
265 775	70	429 993	113
265 776	71	430 727	164
266 158	72	430 759	23
266 246	34	431 961	24
267 121	158	432 064	138
268 416	35	460 741	51
270 746	48-159	466 035	25
271 429	73	601 032	165
271 918	36	601 338	139
272 338	37	602 144	83
272 888	74	603 655	140
274 176	160	606 139	84
275 082	75	607 240	7- 96
277 427	76	610 189	166
282 710	49	610 837	43- 85
282 892	38	612 604	97
283 365	129	621 011	141
283 410	77	622 373	142
283 498	39	623 210	143
284 989	40	627 230	114
285 136	78	633 238	52
285 966	19	633 296	44
286 230	2	633 895	115
286 232	3	635 592	86
286 237	4	636 942	26
286 937	5	636 950	87
288 256	20	644 038	53
288 540	93	650 315	116
289 074	6	656 564	117
290 611	50-130	657 917	98
291 984	79	658 204	8

AD-NUMBER INDEX

AD-NUMBER	PAGE
659 676	54
665 374	99
665 859	27
665 860	28
677 734	29
684 080	100
693 191	56
693 195	101
695 739	118
697 029	119
698 685	120
699 291	9
699 315	10
706 841	144
708 934	57
709 160	58
710 350	102
713 038	167
713 267	59
713 620	30-121
714 219	168
717 881	145
718 180	88
718 226	169
720 928	125
720 988	125
721 032	89
721 898	60
723 679	103
724 992	61
726 444	146
728 039	127
728 216	62-104
729 328	105
729 329	106
729 643	107
729 876	62
730 251	125
730 361	11- 99-147
730 723	148
731 356	108
732 021	149
734 230	91
735 230	126
736 450	127
737 174	128
843 582	31
865 361	64- 92-109
870 494	110