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NAVY DEPARTMENT
BUREAU OF ENGINEERING

Report

on

Test of Ceramic (Porcelain) Insulating Material
submitted by
Porcelain Products, Inc.

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WASHINGTON DC

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CONCLUSIONS

(a) The porcelain submitted by Porcelain Products, Inc., complies with specifications RE 13A 317F as to loss factor and moisture absorption as required for Grade F material.

RECOMMENDATIONS

(a) It is recommended that this material be granted type approval as Grade F material so far as loss factor and moisture absorption requirements are concerned.

DESCRIPTION OF MATERIAL UNDER TEST

4. Porcelain discs 4 inches in diameter and 1/4 inch thick, which were submitted by Porcelain Products, Inc., were subjected to test.

METHOD OF TEST

5. Three samples were soaked in distilled water for 96 hours, after which their surfaces were wiped dry and the loss factor determined, as detailed in paragraph 7(a) of reference (c). These measurements were made at a frequency of 425 kcs. and the results are the same as would have been obtained at 300 kcs. The moisture absorption test was carried out on parts of a disc, as detailed in paragraph 6-2 of reference (b). That is, the fractured parts of the disc were dried 24 hours at approximately 120 degrees Centigrade and accurately weighed; they were then immersed in the distilled water and left for approximately 100 hours, during which time the water was boiled for one hour at four different intervals. The weight was again obtained within a few minutes after removing the material from the water and wiping the surfaces with a clean, dry cloth.

DATA RECORDED DURING TEST

6. The data recorded during the test consisted of a notation of the frequency at which the loss measurements were made, the values of capacity and resistance involved in the loss measurements, the temperature of the heated chamber during the drying out of the specimens of the moisture absorption test, and the weight of specimens both dry and after soaking. See "Results of Test".

PROBABLE ERRORS IN RESULTS

7. The error in the determination of the loss factor is less than 10%. The error in the determination of the weight of the samples in the moisture absorption test is plus or minus .0002 grams or .001% in the value of moisture absorbed with respect to the original weight.

RESULTS OF TEST

8. These samples were tested for compliance with paragraphs 6-1 and 6-2 of specifications, reference (b). The test for loss factor, as detailed in paragraph 6-1, was made on three samples at 425 kcs., with the following results:

<u>Sample</u>	<u>Dielectric Constant</u>	<u>Power Factor</u>	<u>Loss Factor</u>
1	5.96	1.20	7.16
2	5.90	0.92	5.42
3	5.98	0.89	5.32
Mean	5.94	0.97	5.97

9. In the test for moisture absorption, as detailed in paragraph 6-2 of reference (b), the weight of the material after being dried out for

24 hours at 120 degrees Centigrade was 37.6822 grams and after being soaked in distilled water for approximately 100 hours (with the water boiled four times for one hour each time during this interval) the weight was 37.6830 grams. The per cent increase in weight was 0.0021.

CONCLUSIONS

10. The porcelain submitted by Porcelain Products, Inc., complies with specifications RE 13A 317F as to loss factor and moisture absorption as required for Grade F material.