

FR-1248

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SUBJECT

Report of
Test of Foil Paper Capacitors
Type CPC-48205

by

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AUTHORIZATION

1. This work was authorized by Bureau of Engineering letter, reference (a). The governing specifications are listed as reference (b).

Reference: (a) BuEng.let.S67/48/L5(2-25-W8) of 29 Feb. 1936
(b) Specifications RE 13A 488B.

OBJECT OF TEST

2. The object of the tests was to determine if the capacitors complied with the specifications, reference (b), paragraph 5-1(d) and 5-2, with respect to d.c. leakage when dry, and also the efficacy of the sealing method employed in protecting the capacitors against the effects of salt water immersion.

ABSTRACT OF TEST

3. These capacitors were tested to determine the d.c. leakage while dry and the efficacy of the seal in protecting the capacitors against the effects of salt water immersion, as determined by measurement of leakage after immersion in salt water.

CONCLUSIONS

- (a) All of the capacitors tested had very low d.c. leakage while dry.
- (b) 72% of the capacitors withstood the salt water immersion test.
- (c) The type of terminal seal used on these capacitors is believed to be satisfactory and these capacitors are considered suitable for Naval use.

RECOMMENDATIONS

It is recommended that this particular style of Potter capacitor be considered suitable for Naval use.

DESCRIPTION OF MATERIAL UNDER TEST

4. Eighteen foil paper capacitors manufactured by The Potter Company and submitted by the Inspector of Naval Material at Chicago were tested. These capacitors have a rated capacity of 1/2 mfd and a rated working voltage of 200 volts. They bear the type number CPC 48205.

METHOD OF TEST

5. The d.c. leakage of the capacitors was measured by the use of a microammeter at a potential of 200 volts with a protective resistance in series. The salt water immersion test to determine the efficacy of the seal in protecting the capacitors against deterioration from absorption of moisture consisted in soaking the units in a salt water solution at 50°C for 2 hours, transferring them to a similar bath at 0° for 2 hours and then allowing them to remain in a third salt solution for 24 hours at room temperature. The capacitors were then thoroughly rinsed in fresh water and allowed to dry for 1 hour after which the d.c. leakage was again obtained. The leakage current in microamperes was noted both before and after immersion in salt water. These values were multiplied by 2 to obtain leakage in microamperes per microfarad which is given in Table 1, together with the leakage from the terminals to the case. In the flash test a potential of 500 volts was applied for 15 seconds between the terminals and from the terminals to the case after the salt water immersion test, and the leakage noted.

PROBABLE ERROR OF RESULTS

6. The leakage current is believed to be accurate to better than 2%.

RESULTS OF TEST

7. From the data given in Table 1 the results of the test may be summarized as follows:

- (a) The d.c. leakage of the capacitors dry was in all cases much below the value of .8 microampere per microfarad allowed in paragraph 4-2 of reference (b). The maximum leakage dry was .3 microampere and the average was only .17 microampere per microfarad.
- (b) The leakage between terminals after the salt water immersion test exceeded the allowed 2 microamperes per microfarad in 3 of the 18 capacitors, or in 17% of the samples. One of the 3 capacitors was shorted.
- (c) Leakage from the terminals to case after the immersion test was greater than 2 microamperes per microfarad in 5 of the 18 samples or in 28% of those tested. 3 of these 5 capacitors were those mentioned in sub-paragraph (b) above as having high leakage between the terminals.

8. On application of the flash potential of 500 volts for 15 seconds between terminals of the capacitors and from terminals to case, no



Potter capacitor under test, received from I.N.M., Chicago. Terminal seal satisfactory.



Potter capacitor submitted to N.R.L. by manufacturer. Terminal seal unsatisfactory.

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