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26 October 1955

MVT Test of 0.010" Thick

Kel-F Film

W. O. 944

file: Burial Pkg. 55 (BURIAL PACKAGING)

Introduction

Kel-F is a tough, chemically resistant plastic which is stated to have a good resistance to moisture vapor transmission. A sample of Kel-F was furnished by TSS/ED to get a measure of the transmission rate. Results of this test are given in the memorandum.

Summary

1. MVT test showed transmission of 14.1 mg a day of water vapor through 1 sq. ft. of Kel F-sheet 0.010" thick. This corresponds to transmission of about 5 grams of water vapor per year per sq. ft. for Kel-F sheet of this thickness.

2. Blank determinations were higher than normal but probably not high enough to indicate an appreciable effect in the rate of transmission. Agreement between the two blanks and between the two test pieces was good.

3. Further improvement in the pre-drying of the nitrogen gas will be effected before further MVT tests are run.

Details

Testing equipment such as was described under W. O. 633 was used in this test. Four pieces of Kel-F were cut and one each was cemented between top and bottom flanges of each of the four test chambers. Area of the opening in each chamber was 14.1 sq. in., or 0.098 sq. ft.

Water was contained in the bottoms of two of the chambers while the other were left dry to serve as blanks.

Before testing each sample was dried in a calcium chloride desiccator for one week.

As usual in each case, a rather high transmission rate was noted which dropped substantially to its final value in about 10 days.

The test was concluded when a constant rate had been noted for both the blanks and the test pieces mounted above water.

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The difference

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The difference between blanks and test pieces ran 1.0 mg. per day per 14.1 sq. in. or 10.2 mg. per sq. ft. per day. A high blank of 6 mg. per day per 14.1 sq. in. or 61 mg. per sq. ft. per day. However, both blanks and both test pieces checked each other throughout the final week of the test. On the basis of the rate of sweeping with the nitrogen gas it was calculated that the gas was less than 10% saturated so that it is doubtful that the moisture vapor transmission rate was greatly affected.

For the above reasons it is believed that the calculated transmission rates are accurate and representative of the samples tested. However, it is poor practice to have so large a blank. Therefore, a better drying system is being installed in the gas line together with means for making a better check of the effectiveness of the dryer.

On the basis of this test 0.010" Kel-F compares favorably with the Mylar-aluminum foil-Mylar laminates tested under W. O. 633.

[Redacted Signature]

Chief

Technical Services Laboratory, TSS

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✓ Orig. - ED/
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