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FLAMMABILITY OF PLASTIC MATERIALS

ANSI/UL 94 Standard for Safety

Material Tested: MPM 100 Run #1

Report Number 78866

Test Number 2272-8599

May 31, 1991

Prepared for:

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INTRODUCTION:

This report is a presentation of test results of a small-scale flammability test conducted for Architectural Surfaces, Inc. of Chaska, Minnesota.

The test was conducted in accordance with the ANSI/UL 94 Standard for Safety "Tests for Flammability of Plastic Materials," 1990 edition. This test is used to determine the flammability of plastic materials used for parts in devices and appliances and is intended to serve as a preliminary indication of their acceptability with respect to flammability for a particular application. The test involves the use of small, standard size specimens and their response to heat and flame under controlled laboratory conditions. The performance level of materials tested by this method should not be assumed to correlate with its performance in end-use applications.

The test result presented herein relates only to the specimens tested and are not necessarily indicative of apparent identical or similar materials. The UL 94 standard provides that if a material is to be considered in a range of colors, densities, melt flows, thicknesses, or reinforcement, specimens representing those ranges must be tested also. All test data are on file and available for review by authorized persons.

TEST METHOD:

The test was conducted in accordance with Section 3, Vertical Burning Test for Classifying Materials 94V-0, 94V-1, 94V-2.

The test is conducted using test specimens measuring 1/2-inch wide by 5-inches long by the design thickness. The test specimen, suspended vertically in a test cabinet, is exposed to a methane gas flame placed centrally under the lower end of the specimen for 10 seconds. The test flame is then withdrawn and the duration of flaming of the specimen recorded. This is followed by a second application of the flame for an additional 10 seconds, withdrawal of the flame, and the duration of the flaming and glowing noted. During exposure, a small swatch of surgical cotton is placed beneath the test specimen to determine whether or not the specimen drips flaming particles that ignite the cotton.

SPECIMEN CONDITIONING:

One set of 5 test specimens is conditioned to equilibrium in an atmosphere maintained at 71°F ± and a relative humidity of 50 ± 3 percent. An additional set of 5 specimens is conditioned for 168 hours in a circulating hot air oven maintained at 70°C. Prior to testing, the specimens are cooled to room temperature in a desiccator.

TEST DATA:

The material identification, provided by the Client, and the data obtained during the course of testing is presented in the tables at the end of the report.



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The UL 94 standard provides for classification of materials based on results of this test. The criteria for the classification are:

94V-0 Classification

- [1] No single specimen shall have a flame duration of greater than 10 seconds after either application of the test flame.
- [2] The sum total flame duration after both applications of the test flame may not exceed 50 seconds.
- [3] None of the specimen may burn up to the clamp holding the specimen in the test cabinet.
- [4] No individual specimen may drip flaming particles which ignite the cottons watch located 1 2 inches below the specimen.
- [5] No individual specimen may have an afterglow for more than 30 seconds after the second flame application.

94V-1 Classification

- [1] No single specimen shall have a flame duration of greater than 30 seconds after either application of the test flame.
- [2] The sum total flame duration after both applications of the test flame may not exceed 250 seconds.
- [3] None of the specimens may burn up to the clamp holding the specimen in the test cabinet.
- [4] No individual specimen may drip flaming particles which ignite the cottons watch located 1 2 inches below the specimen.
- [5] No individual specimen may have an afterglow for more than 60 seconds after the second flame application.

94V-2 Classification

- [1] No single specimen shall have a flame duration of greater than 30 seconds after either application of the test flame.
- [2] The sum total flame duration after both applications of the test flame may not exceed 250 seconds.
- [3] None of the specimens may burn up to the clamp holding the specimen in the test cabinet.
- [4] The specimens are permitted to drop flaming particles which ignite the cotton swatch located 12 inches below.
- [5] No individual specimen may have an afterglow for more than 60 seconds after the second flame application.

CLASSIFICATION:

Based on the results of these tests, the material tested may be classified in accordance with this standard as 94V-O.



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TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS - UL 94

Dual Wave Conform with 94HF-1 Specifications of Underwriters Laboratories Inc. as described below.

4.3 MATERIALS CLASSED 94HF-1 –

Materials classed 94HF-1 shall: (also see paragraph 4.5)

- A. Not have any portion of 4 specimens out of each set of 5 specimens tested continue to flame for more than 2 seconds after the test flame is removed.
- B. Not have any portion of any test specimen continue to flame for more than 10 seconds after removal of test flame.
- C. Not have any portion of any test specimen continue to flame for more than 2.25 inches (57.2 mm) from the end exposed to the test flame.
- D. Not have any of the specimens drip flaming particles which ignite dry absorbent surgical cotton placed 1 2 inches (305 mm) below the test specimen.
- E. Not have any test specimens with glowing combustion which:
 - 1. Persists beyond 30 seconds after removal of test flame.
 - 2. Travels past the 2.25 inch (57.2 mm) mark.

4.4 MATERIAL CLASSED 94HF-2 –

Material classed 94HF-2 shall: (also see paragraph 4.5)

- A. Not have any portion of 4 specimens out of each set of 5 specimens tested continue to burn for more than 2 seconds after removal of test flame.
- B. Not have any portion of any test specimens continue to flame for more than 10seconds after removal of test flame.
- C. Not have any specimens affected for a distance greater than 225 inches (57.2 mm) from the end exposed to the test flame.
- D. Have specimens that drip flaming particles which burn only briefly, some of which ignite the dry absorbent surgical cotton placed 1 2 inches (305 mm) below the test specimen.
- E. Not have any specimens with glowing combustion which:
 - 1. Persists beyond 30 seconds after removal of the test flame.
 - 2. Travels past the 2.25 inch (57.2 mm) mark.

- 4.5 If only 1 specimen from a set of 5 specimens fails to comply with the appropriate requirements, another set of 5 specimens shall be tested. All specimens shall be tested. All specimens from this second set shall comply with the appropriate requirements in order for the foamed plastic material in that thickness and density to be classified 94 HBF, 94HF-1, 94HF-2.



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