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THE DEPARTMENT OF FIRE TECHNOLOGY

INVESTIGATION OF SURFACE BURNING CHARACTERISTICS OF A

**FIRE-RETARDANT COATING,
BURN BARRIER™ NO. 30-30
SEMI-GLOSS ENAMEL OVERCOAT**

Project No. 01-1373-418

FINAL REPORT

August 31, 1987

Prepared for

FIRE RETARDANTS INC.™
123 Columbia Court North •
Suite 201
Chaska, MN 55318



SOUTHWEST RESEARCH INSTITUTE

SAN ANTONIO, TEXAS

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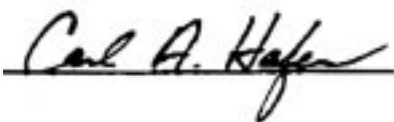
FINAL REPORT

AUGUST 31, 4, 1987

Prepared for:

FIRE RETARDANTS INC.
123 Columbia Court North • Suite 201
Chaska, MN 55318

By:



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I. INTRODUCTION

This report presents the results of a flame spread tunnel test on a fire-retardant coating submitted for evaluation by FIRE RETARDANTS INC™ 123 Court North, Suite 201, Chaska, MN 55318. The report contains a description of the material tested, the preparation and conditioning of the specimen, the test procedure, and finally, the test results. Note that the results only apply to the specimen tested, in the manner tested, and not to the entire production of this or similar materials, nor to this material's performance when used in combination with other materials. All test data are on file and are available for review by authorized persons.

The test was conducted in accordance with the provisions of ASTM Designation E84, Standard Method of Test for "Surface Burning Characteristics of Building Materials." This test method is similar to the test method specified in NFPA No. 255, UL No. 723 and UBC No. 42-1. ASTM E84 is a test procedure method only and does not set requirements for materials. Therefore, SwRI does not assign a classification to the material tested. Building codes, such as the Uniform Building Code, have requirements dependent on building type, occupancy, etc. The building code having jurisdiction in the location a material is to be used will determine compliance of the test results.

The purpose of the test was to evaluate performance of the test specimen in relation to that of glass-reinforced-cement board and red oak flooring under similar fire exposure. The results are expressed in terms of flame spread and smoke developed during a 10-minute exposure and are recorded as a ratio with glass-reinforced-cement board 0 and red oak flooring 100.

II. DESCRIPTION OF MATERIALS

On July 30, 1987, the test material was received from the Client. It is described in Table I. on the following page.

TABLE 1 DESCRIPTION

| | |
|---------------------|-----------------------------------------------------|
| Type: | Fire-Retardant enamel |
| Identification No.: | No. 30-30 Semi-Gloss Fire-Retardant Enamel Overcoat |
| Color: | White |
| No. /Size Received: | 1 gallon can |
| Total Weight: | 1.968 lb |
| Substrate Used: | 0.25-in. (6.35-mm) glass-reinforced-cement board |

III. PREPARATION AND CONDITIONING OF TEST SPECIMEN

The 21-in. x 25-ft (0.53 x 7.63-m) specimen was prepared using four 21 x 75-in. (0.53 x 1.91-m) sections of 0.25-in. (6.35-mm) glass-reinforced-cement board as the substrate. The coating was applied by roller to the substrate at a coverage rate of 400 ft²/gal (9.83 m²/L). This resulted in 3.5 fluid oz per 21 x 75-in, board.

The specimen was conditioned for 22 days in an atmosphere maintained between 68 and 78°F (20 and 26°C) temperature and 45 – to 55-percent relative humidity.

IV. TEST PROCEDURE

The test was conducted on August 26, 1987. Reference data were obtained and furnace operation checked by conducting a 10-minute test with glass-reinforced-cement board on the day of the test and by periodic tests with red oak flooring. These tests provided the 0 and 100 references for flame spread and smoke developed. Ignition over the burners was noted 40 seconds after the start of the test in the most recent calibration with red oak flooring. Each specimen to be evaluated was tested in accordance with the standard procedure.

V. TEST RESULTS

The test results were calculated on the basis of observed flame travel and the measurement of areas under the recorder curves of furnace temperature and smoke developed (see Table 2). To allow for possible variations in results due to limitations of the test method, the numerical results were adjusted to the nearest -figure divisible by 5. Recorded data for flame spread, smoke developed and temperature for the specimen are shown in the figures at the end of this report as a solid line on each graph.

TABLE 2 CLASSIFICATION

| Test Specimen | Flame Spread Index E84-86 | Smoke Developed |
|--------------------------------------------------------------------------------------------------|----------------------------------|------------------------|
| Glass-Reinforced-Cement Board | 0 | 0 |
| Red Oak Flooring | 100 | 100 |
| No. 30-30 Semi-Gloss Fire-Retardant Enamel Overcoat Applied on Glass-Reinforced Cement Board*520 | 5 | 20 |

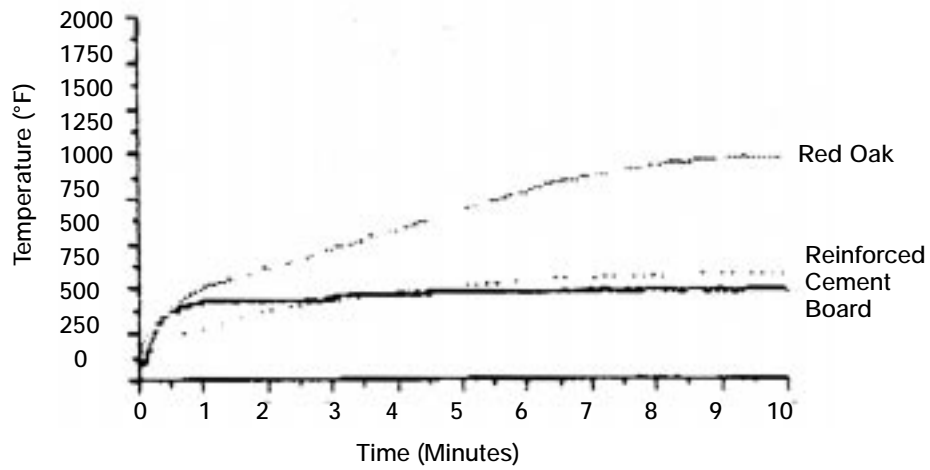
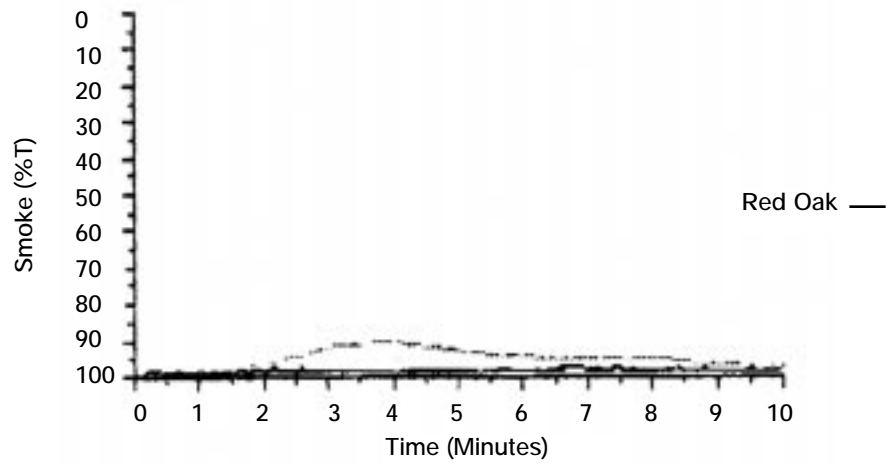
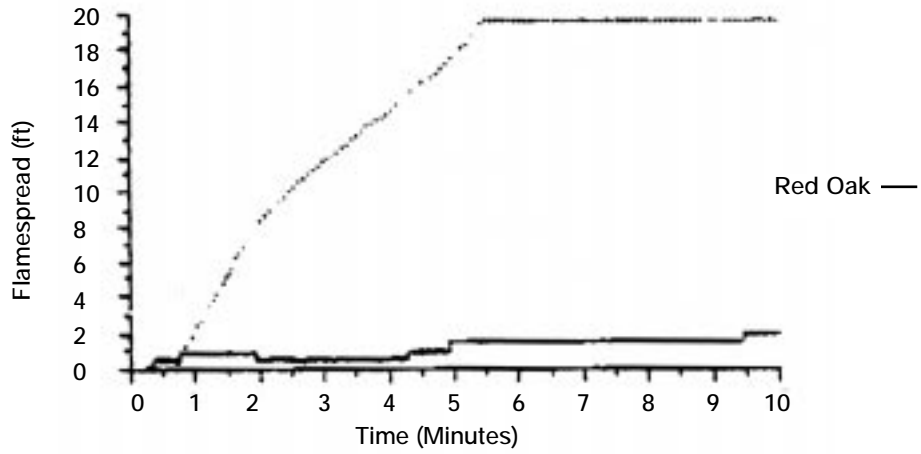
*A fire retardant coating is usually applied on a combustible (wood) substrate.

VI. OBSERVATIONS DURING AND AFTER TEST

Observations made during and after the test are presented in Table 3 below.

TABLE 3 OBSERVATIONS

| Event | |
|------------------------------|--------|
| Event Spotty Ignition, min:s | 0:25 |
| Steady Ignition, min:s | 0:45 |
| Blisters, min:s | 0:28 |
| Color Change, min:s | 0:30 |
| Board Turned Black, min:s | 2:00 |
| Turned White Again, min:s | 6:13 |
| Maximum Flame Front | |
| Advance, min:s | 9:30 |
| ft | 7.5 |
| (m) | (2.29) |
| After flame, min:s | -- |
| Consumed/Complete | |
| Char, ft | 4.0 |
| (m) | (1.22) |
| Heavy Char, ft | 6.0 |
| (m) | (1.83) |
| Surface char, ft | 10.0 |
| (m) | (3.05) |
| Discoloration, ft | 25.0 |
| (m) | (7.63) |



**A FIRE-RETARDANT COATING: NO. 30-30
SEMI-GLOSS ENAMEL OVERCOAT G-836**