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THE DEPARTMENT
OF
FIRE TECHNOLOGY

INVESTIGATION OF SURFACE BURNING CHARACTERISTICS OF A FIRE-RETARDANT COATING, BURN BARRIER™ NO. 111 FLAT BLACK INTUMESCENT FR PAINT TTP-26

Project No. 03-4684-235
FINAL REPORT
March 14, 1977
Prepared for

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

SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO CORPUS CHRISTI HOUSTON

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Department of Structural Research Fire Research Section

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By

C.A. Hafer

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I. INTRODUCTION

This report is a presentation of the results of a flame spread tunnel test on a fire-retardant coating, BURN BARRIER™ No. 111 Flat Black FR Paint TTP-26, submitted for evaluation by Fire Retardants Inc, 123 Columbia Court North, Suite 201, Chaska, MN 55318.

The report contains a description of the material, the preparation and conditioning of the specimen, the test procedure) and the test results. The results presented apply only to the specimen tested arid not to the entire production of this or similar material. These reflect performance in the manner tested-not necessarily performance when used in combination with other materials. AU test data are on file arid are available for review by authorized persons.

The test was conducted in accordance with the provisions of ASTM Designation E84-75, "Standard Method of Test for Surface Burning Characteristics of Building Materials. "This test method is technically equivalent to that specified in ANS No. 2.5, NFPA No. 255, UL No. 723 and USC No. 42-1.

The purpose of the test is to evaluate performance of a material in relation to that of asbestos -cement board and red oak flooring under similar fire exposure. The results are in terms of flame spread, fuel contributed and smoke developed during a 10-minute exposure and are expressed as a ratio with asbestos-cement board zero and red oak flooring 100.

II. DESCRIPTION OF MATERIALS

On February 16, 1977, a 1-gal. (3.79-L) can of BURN BARRIER™ No. 111 Flat Black Intumescent Fire-Retardant Paint TTP-26 was received from the Sponsor. The can of paint had a gross weight of 106 lb (4.81 kg). The Sponsor requested that the FR paint be applied to unprimed Douglas Fir wood at 180 ft^2 /gal (4.41 m^2 IL) in one coat (by brush) with a 14-day minimum cure prior to test.

II**I. PREPARATION AND CONDITIONING OF TEST SPECIMENS**

The 21-in. X 25-ft (53.34-cm X 7.62-m) specimen was prepared using two 21-in. X 12-ft 6- in. (53.34-cm X 3.81-m) panels consisting of 1 X 3-in. (2.54 X 7.62-cm) tongue-and-groove Douglas Fir wood fastened together with 1 X 4-in. (2.54 X 10.16-cm) back straps spaced 3 to 4 ft (0.91 to 1.22 m) on centers. The coating was applied by brush at 180 ft^2/gaL (4.41 m2 /L) onto the unprimed Douglas Fir on February 18. 1977.

The specimen was conditioned for 19 days in an atmosphere maintained between 700 and 75°F temperature and 35 to 40 percent relative humidity.

IV. TEST PROCEDURE

The test was conducted on March 9, 1977. Reference data were obtained and furnace operation checked by conducting a 10-minute test with asbestos-cement board on the day of the test and by periodic tests with red oak flooring. This provided the zero and 100 references for flame spread, fuel contributed, and smoke density. Ignition over the burner was noted 52 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 with the coating exposed to the igniting flames inside the tunnel furnaces

I. TEST RESULTS

The test results, calculated on the basis of observed flame travel and the areas under the recorder curves of furnace temperature and smoke density, are presented in the following table. In recognition of possible variations in results due to limitations of the test method, the numerical results are adjusted to the nearest figure divisible by 5.

CLASSIFICATION TABLE

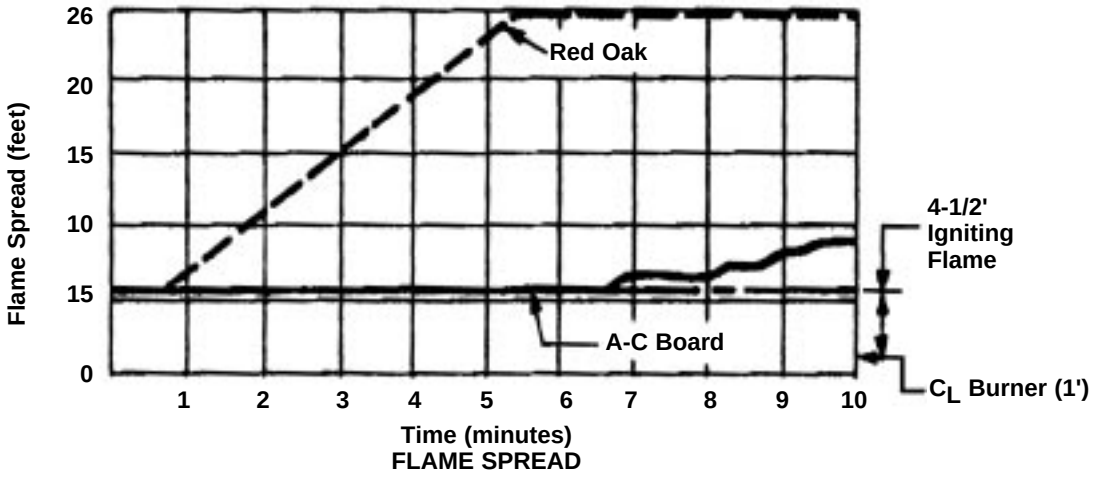
Test Specimen	Flame Spread Rate	Fuel Contributed Factor	Smoke Density Factor
Asbestos-Cement Board	0	0	0
Red Oak Flooring	100	100	100
BURN BARRIER™ No. 111 Flat Black FR TTP-26 Applied to unprimed Douglas Fir Wood, 180 ft^2/gal. (4.41 m2/L)	15 (5)*	5	0

ASTM-84-76a

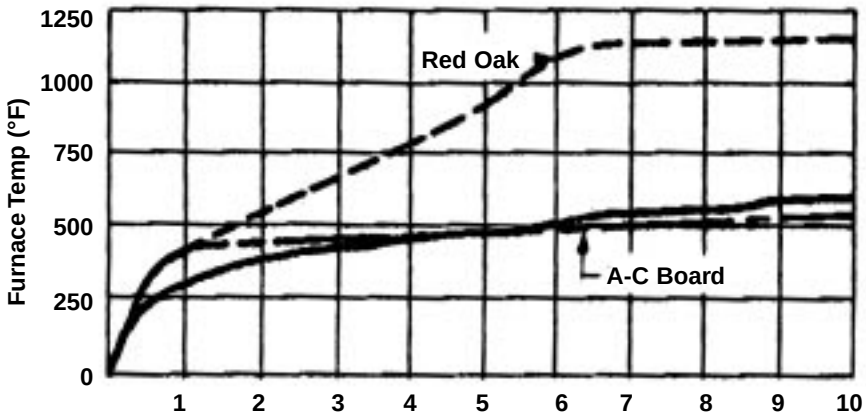
II. OBSERVATIONS DURING AND AFTER TEST

The observations made during and after the test are summarized as follows: Intumescent action and ignition were observed at 30 seconds. The flame front advanced slowly reaching 8 ft (2.44m), 2-1/2-ft (0.76-rn) advance, at 9-1/2 minutes. After flame persisted for 30 seconds.

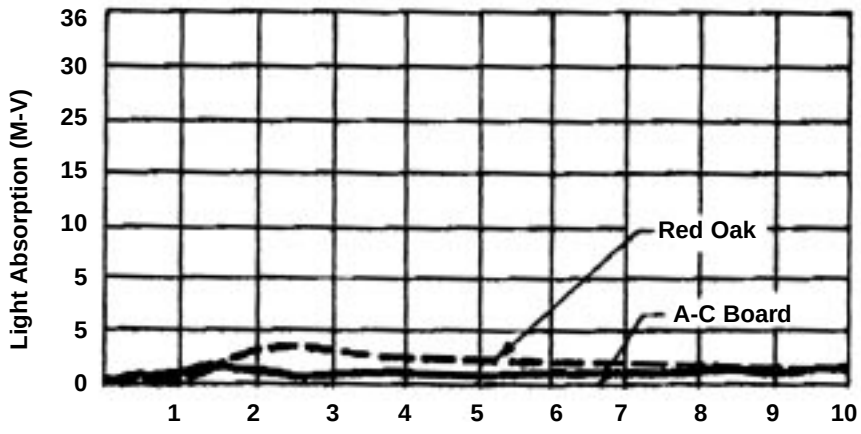
The wood had charred on the surface to 8 ft (2.44 m). Intumescent char had formed to 11 ft. (3.35 m).



FLAME SPREAD



FUEL CONTRIBUTION
(Furnace Temperature)



SMOKE DENSITY
(M-V Depression–Photocell)

SURFACE BURNING CHARACTERISTICS OF A FIRE-RETARDANT COATING ON UNPRIMED DOUGLAS FIR WOOD. FIRE RETARDANTS NO. 111 FLAT BLACK FR PAINT TTP-26