

PITTSBURGH

M. BOYLE
Manager
Special Test



Pittsburgh Testing Laboratory

PG-13040

ATTN: STEVE
CRIST

June 6, 1983

WATER VAPOR
PERMEABILITY
ASTM E-96

Miraco, Inc.
P.O. Box 27
Wexford, PA 15090

Attention:

Reference: Water Vapor Transmission Test Report
PG-13040, Lab 802683

Dear Mr. Fitzgerald:

Confirming our telephone conversation with Mr. Joe Wilson of Miraco on June 6, 1983, we have found that there was an error on our Test Report dated January 11, 1980 (PG-13040, Lab 802683), under the Section of Test Results (Average Permeability) Perm-Inches.

The technician accidentally used the incorrect conversion factor when converting from Metric-Perms-CM to Perms. The factor used was 1.67 instead of 0.598 as shown in the following example:

Incorrect Specimen #1: 3.124 Metric x 1.67 = 5.217 Perms.
Correct Specimen #1: 3.124 Metric x 0.598 = 1.868 Perms.

This conversion factor can be found on Page 497, Table 2, of ASTM E-96-66, a copy of which is enclosed for your review. The procedure and error used is outlined in blue.

Please accept our apology for the inconvenience of our error. We hope this information will meet your requirements.

Very truly yours,

PITTSBURGH TESTING LABORATORY

Michael V. Boyle, Manager
Special Test Department

WRD/mam

Enclosures



PITTSBURGH TESTING LABORATORY

ESTABLISHED 1961

650 POPLAR STREET, PITTSBURGH, PA. 15220

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AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 802683

CLIENTS No. Ltr. 12-12-79
W. M. Fitzgerald

REPORT

ORDER No. PC-13040

January 11, 1980

*REVISED REPORT
JUNE 6, 1983

Report Of : Water Vapor Transmission Test
On : Miracote Cementitious Coating
For : Miraco, Inc.
P.O. Box 27
Wexford, Pennsylvania 15090

GENERAL

The client submitted to the laboratory four (4) cementitious discs identified by the client as Miracote Cementitious Coating.

The material was tested for Water Vapor Transmission Properties.

TEST PROCEDURE

The material was tested in accordance with ASTM E-96-66 (72) "Standard Methods of Test for Water Vapor Transmission of Materials in Sheet Form."

Three (3) specimens were placed and sealed in dishes containing Calcium Chloride desiccant. One was sealed into the dish without desiccant which was the dummy specimen.

The dishes were placed in the controlled chamber and weight change noted. When a steady state straight line weight gain vs time was established, the Water Vapor Transmission was calculated.

TEST RESULTS

Procedure A

1. Measured temperature 70.25^oF.
2. Measured Relative Humidity 57%.

Average Thickness of Specimen

1. 0.115"
2. 0.122"
3. 0.144"
4. 0.160"



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AREA CODE 412 TELEPHONE 922-8000

LABORATORY No. 802683

ORDER No. PG-13040

January 11, 1980

CLIENT'S No. Ltr. 12-12-79
W. M. Fitzgerald

REPORT

*REVISED REPORT
JUNE 6, 1983

TEST RESULTS cont'd

Specimen	WVT (g/m ² .24 hrs)	(grains/h.ft. ²)
1	113.798	6.805
2	Dummy	Dummy
3	98.815	5.909
4	86.458	5.170
	Average: 99.69	Average: 5.961

Permeance

Specimen	(Metric Perms)	(Perms)
1	10.695	16.256
2	Dummy	Dummy
3	9.287	14.116
4	8.126	12.352
	Average: 9.369	Average: 14.241

Average Permeability

Specimen	(Metric-Perms-CM)	(Perms-Inches)
1	3.124	1.868
2	Dummy	Dummy
3	3.399	2.034
4	3.299	1.973
	Average: 3.274	Average: 1.958

*Report revised to indicate correct results under Average Permeability (Perm-Inches).

PITTSBURGH TESTING LABORATORY

Michael V. Boyle
Michael V. Boyle, Manager
Special Test Department

WRD/mam

cc: 2 - Miraco, Inc.
Attention: Mr. W. M. Fitzgerald

FIRE RESISTANCE

ATTN: STEVE
CAHILL

ASTM E-84

ASTM E-84 (79a) FIRE TEST RESULTS

ON

SURFACE BURNING CHARACTERISTICS OF

MIRACOTE COATING MATERIAL

for

MIRACO, INC.

BOX 27

WEXFORD, PENNSYLVANIA 15090

J.I. 0F0Q9.AC
CLASS NO. 4820

MARCH 5, 1980



Factory Mutual Research

1151 Boston-Providence Turnpike
Norwood, Massachusetts 02062



Factory Mutual Research

1151 Boston-Providence Turnpike
Norwood, Massachusetts 02062

OFOQ9.AC
(4820)

March 5, 1980

ASTM E-84 (79a) FIRE TEST RESULTS
ON
SURFACE BURNING CHARACTERISTICS OF
MIRACOTE COATING MATERIAL

for

MIRACO, INC.
BOX 27
WEXFORD, PENNSYLVANIA 15090

I INTRODUCTION

1.1 This report provides evaluation results per ASTM E84 (79a) Standard on a coating material manufactured by Miraco, Inc. and designated as MIRACOTE.

1.2 This report supersedes Factory Mutual's Report OABQ4.AC dated April 27, 1978 which contained the results of three tests conducted on MIRACOTE when evaluated per ASTM E84 (75) Standard.

1.3 The data generated under the previous test program was used in establishing product performance per the 1979 Standard. The tests referenced in this report are as recorded in the F.M. Report OABQ4.AC.

1.4 The tests were conducted in accordance with the Standard Method of Test for Surface Burning Characteristics of Building Materials, ASTM Designation E-84. The results yield flame spread and smoke density values for the tested material during a 10 minute fire exposure.

1.5 The purpose of the test is to determine the comparative surface burning characteristics of building materials by evaluating the flame spread performance of red oak under identical conditions. The smoke density of the material may be compared with that of asbestos-cement and red oak which have been arbitrarily established as 0 and 100 respectively.

1.6 The tests were conducted at the Factory Mutual Research Corporation in Norwood, Massachusetts.

II MATERIAL DESCRIPTION

2.1 MIRACOTE is an elastomeric coating material which can be used on both interior and exterior building surfaces.

2.2 MIRACOTE is composed of dry mineral aggregate combined with a proprietary dry compound, which together is mixed with a liquid catalyst.

FACTORY MUTUAL RESEARCH CORPORATION

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2.3 The material was brush applied to 1/4 inch (6.35 mm) thick asbestos cement board at a nominal thickness of .075 inch (1.9 mm).

2.4 The manufacture of the product and the preparation of the test specimens were witnessed by a representative of Factory Mutual. Formulation and physical specifications of the product are on file at Factory Mutual.

III TEST METHOD

3.1 The furnace, constructed to ASTM E-84 (75) specifications, was preheated for a 10 minute period with the asbestos-cement board and the removable top in place. During this time, the exposure flame and draft conditions were adjusted to meet the ASTM E-84 requirements of 5,000 btu (5.3 MJ/min.) producing a 4-1/2 ft. (1.37 m) flame length with an air velocity of 240 ± 5 ft/min. (73.2 ± 1.5 m/min.).

3.2 Under these conditions with red oak flooring having a moisture content of 6 to 8%, the flame spreads 19-1/2 ft. (5.94 m) from the end of the igniting flame in 5 min. 30 sec. \pm 15 sec.

3.3 The furnace was allowed to cool until the brick temperature was $105 \pm 5^{\circ}\text{F}$ ($40.5 \pm 2.8^{\circ}\text{C}$) as measured by a thermocouple imbedded 1/8 in. (3.175 mm) below the surface of the furnace floor at a point 13 ft. (3.96 m) from the burners.

3.4 The sample material was placed on the ledge of the tunnel furnace with the coated surface exposed to the flame.

3.5 During the test, the advancement of the flame front was noted visually through the viewing ports located on the side of the furnace. Smoke emission was continuously monitored by a photoelectric circuit mounted vertically across a horizontal section of the flue pipe.

3.6 The above test procedure was followed for the three tests.

IV FLAME SPREAD DETERMINATION

4.1 The flame spread distances versus time are plotted to establish a curve for the material tested. The total (A_T) under the flame spread time distance curve is determined while ignoring any flame front recession. The flame spread distance is the observed distance minus the 4-1/2 ft. (1.37 m) due to the ignition fire.

4.2 The Flame Spread Index (FSI) shall be determined as follows:

4.2.1 If this total area (A_T) is less than or equal to 97.5 ft-min., the Flame Spread Index shall be 0.515 times the total area ($\text{FSC} = 0.515 A_T$).

4.2.2 If the total area (A_T) is greater than 97.5 ft-min., the Flame Spread Index shall be 4900, divided by the difference of 195 minus the total area (A_T), ($\text{FSC} = 4900/(195-A_T)$).

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<u>Specimen</u>	<u>Flame Spread</u>	<u>Smoke Density</u>
MIRACOTE Coating .075 inch (1.9 mm) thickness over asbesto-cement bd.	5	0

7.2 These numerical flame spread and smoke density values do not define the hazards presented by this or any material under actual fire conditions.

7.3 Under this program, the products of combustion were not analyzed nor is it required by the ASTM E-84 test method to be performed.

7.4 The Factory Mutual Research Corporation makes no judgement of product suitability for its intended end-use solely as a result of ASTM E-84 tests. This decision is usually the prerogative of the local authority having jurisdiction.

7.5 After the Product Listing Agreement (Form 1281) is signed and returned to Factory Mutual, the product will be listed and the manufacturer is permitted to mark his product as having been tested by Factory Mutual per the ASTM E-84 test method. See Appendix Sheet 6 for product identification marking.

VIII MANUFACTURER'S RESPONSIBILITIES

~~8.1 The manufacturer shall notify the Factory Mutual Research Corporation of any change in the product prior to general sale and distribution.~~

IX AUDIT INSPECTION AND RE-EXAMINATION

9.1 A manufacturing and quality control audit inspection will be conducted periodically on the listed product at the Allied Block Chemical Company facility in New Eagle, Pennsylvania to determine that the quality and uniformity of the product has been maintained and will provide the same level of performance as originally tested.

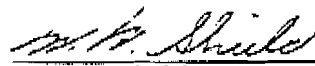
9.2 A re-examination may be required to assure any changes in the composition or specified properties of the product. The current Factory Mutual Specification Tested Building Materials publication shall be consulted.

TESTS SUPERVISION AND REPORT BY:

REPORT APPROVED BY:



T. M. Chestnut
Materials Engineer



W. F. Shield
Assistant Manager, Materials Section
Codes/Ratings

TMC/bb

ORIGINAL DATA:
ATTACHED:

Laboratory Book No. OF
Appendix Sheets 1-6

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4.3 The following are the flame spread results of the three tests:

<u>Test</u>	<u>A_t</u> <u>(Ft-Min.)</u>	<u>Maximum Flame Spread</u> <u>(Min:Sec)</u>	<u>Calculated</u> <u>Flame Spread</u>
1	8.35	7:50	4.3
2	6.61	7:35	3.4
3	7.07	9:40	3.6

4.4 Appendix Sheets 1, 2 and 3 are time-distance curves for flame spread of the test specimens.

V SMOKE DENSITY DETERMINATION

5.1 The smoke developed by the material during the test is indicated by the output of photoelectric circuit mounted vertically across a horizontal section of the flue pipe. Continuous recording of this output on a chart recorder yields a time absorption curve for smoke density. The value for the smoke density classification is computed as follows:

$$\text{Smoke Density Classification} = \frac{A_m}{A_{ro}} 100$$

A_m = Area under curve for material tested

A_{ro} = Area under curve for red oak

5.2 The following are smoke density results of the three tests:

<u>Test</u>	<u>Calculated Smoke Density</u>
1	0
2	0
3	0

5.3 Appendix Sheet 4 is the time-absorption curve for smoke density of red oak and asbestos-cement. Appendix Sheet 5 is a typical curve of the tested material.

VI SUMMARY OF TEST RESULTS

6.1 The average values of the tested material are as follows:

<u>Flame Spread</u>	<u>Smoke Density</u>
4	0

VII CONCLUSIONS

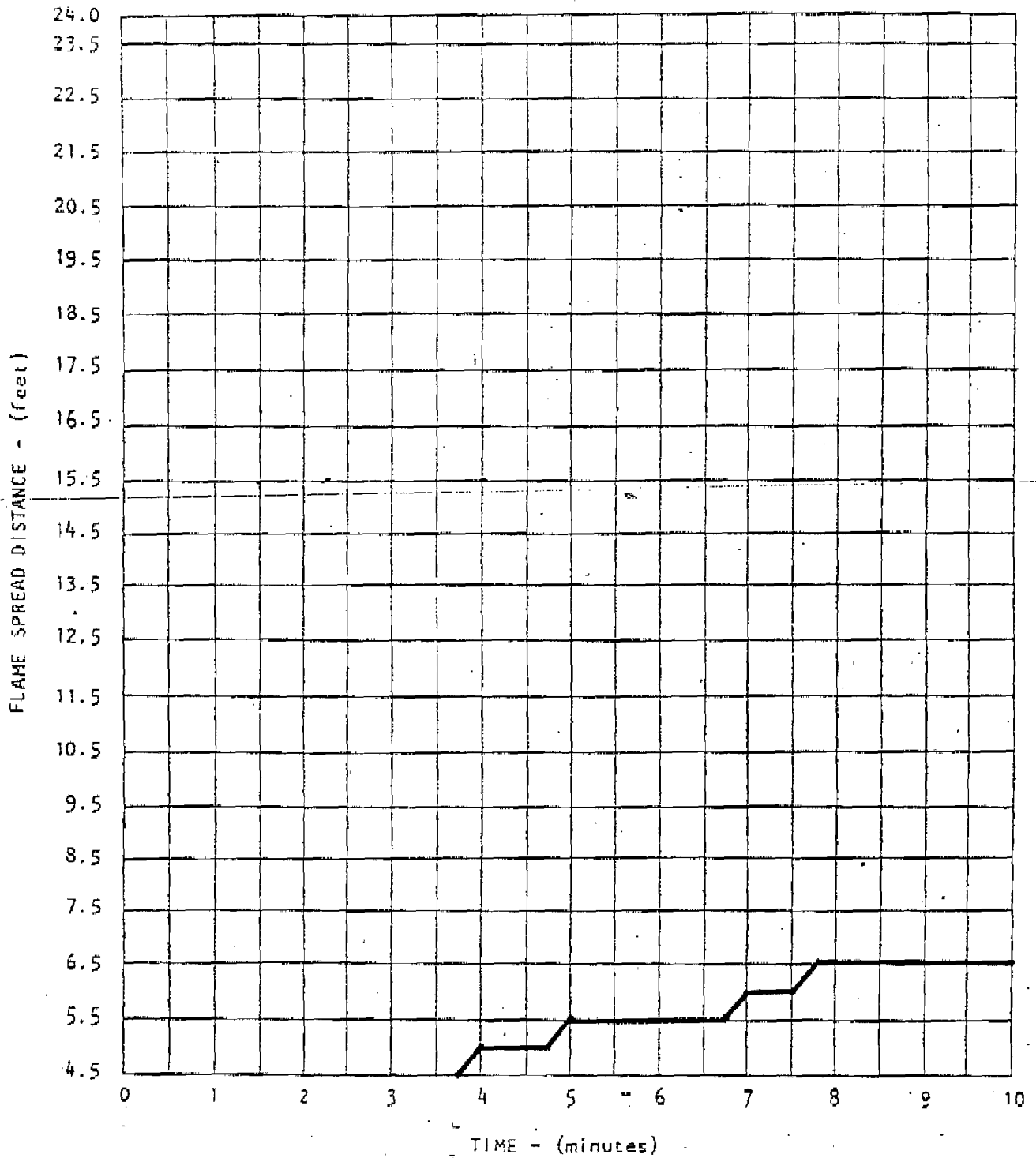
7.1 MIRACOTE coating material manufactured by Miraco, Inc. exhibited the following average values rounded to the nearest multiple of five, when evaluated per the Standard Method of Test for Surface Burning Characteristics of Building Materials, ASTM designation E-84 (79a):

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Appendix Sheet 1

TEST NUMBER 1 FLAME SPREAD 4.3 MIN.-FT. 8.35

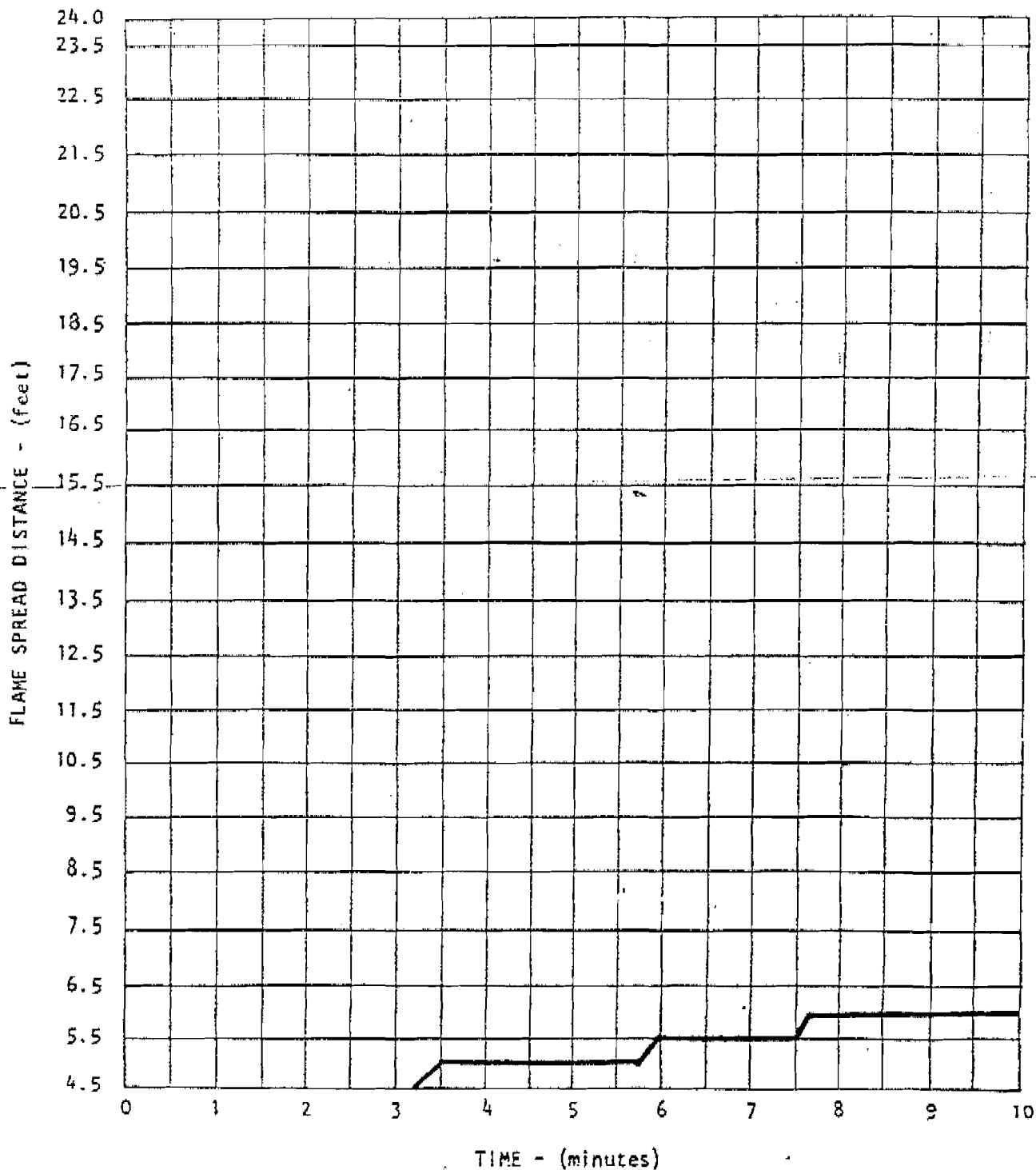


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Appendix Sheet 2

TEST NUMBER 2 - FLAME SPREAD 3.4 MIN.-FT. 6.61

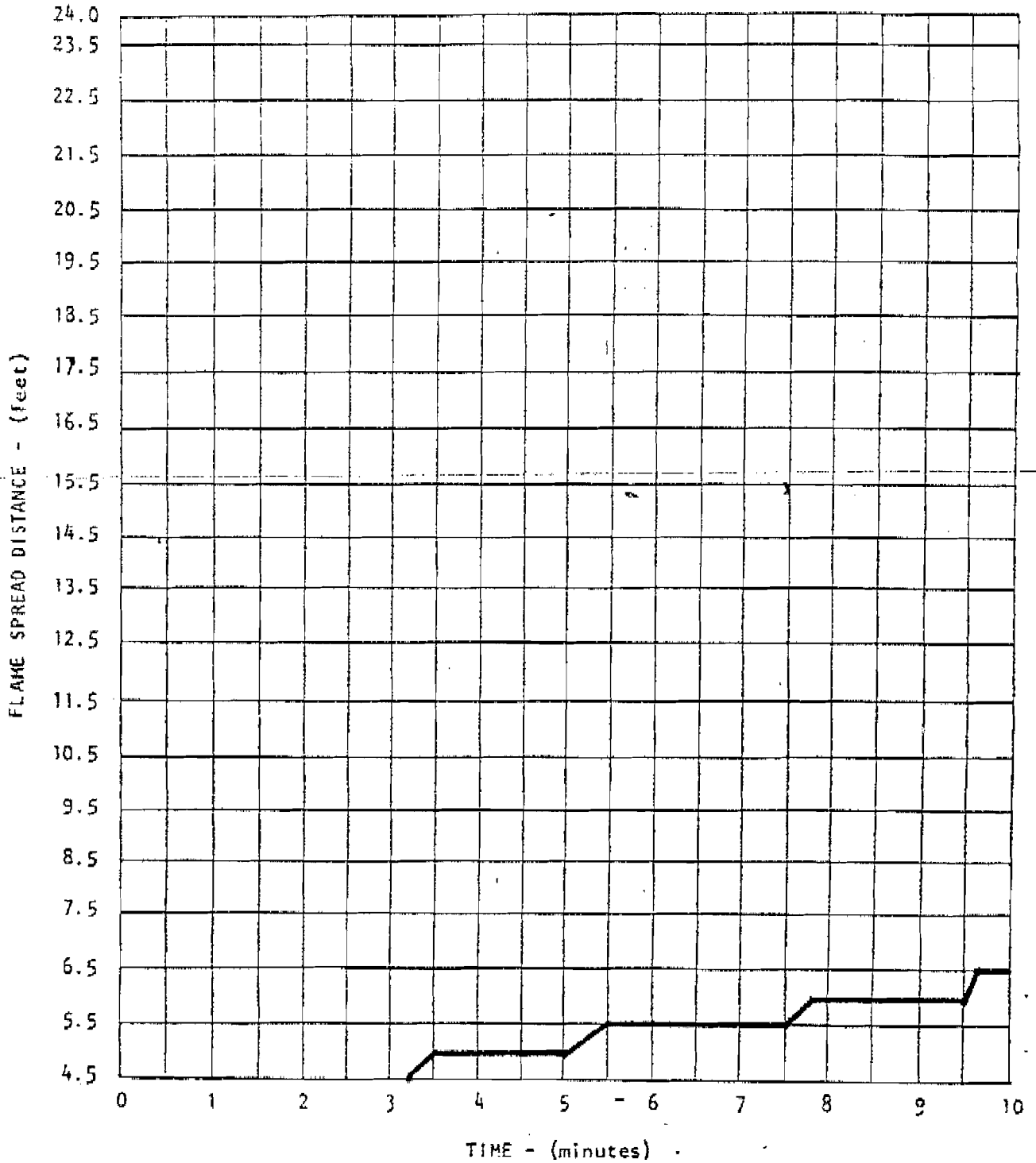


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Appendix Sheet 3

TEST NUMBER 3 FLAME SPREAD 3.6 MIN.-FT. 7.07



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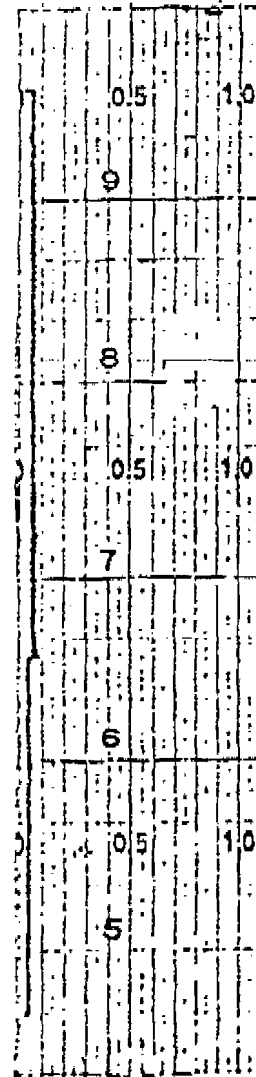
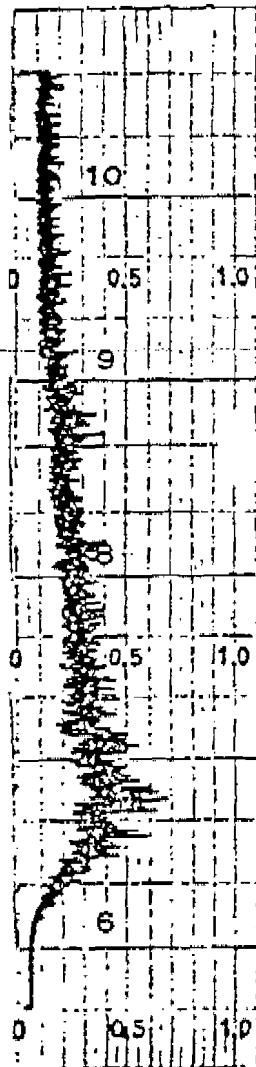
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Appendix Sheet 4

SMOKE DENSITY CURVES

RED OAK FLOORING

ASBESTOS-CEMENT BOARD



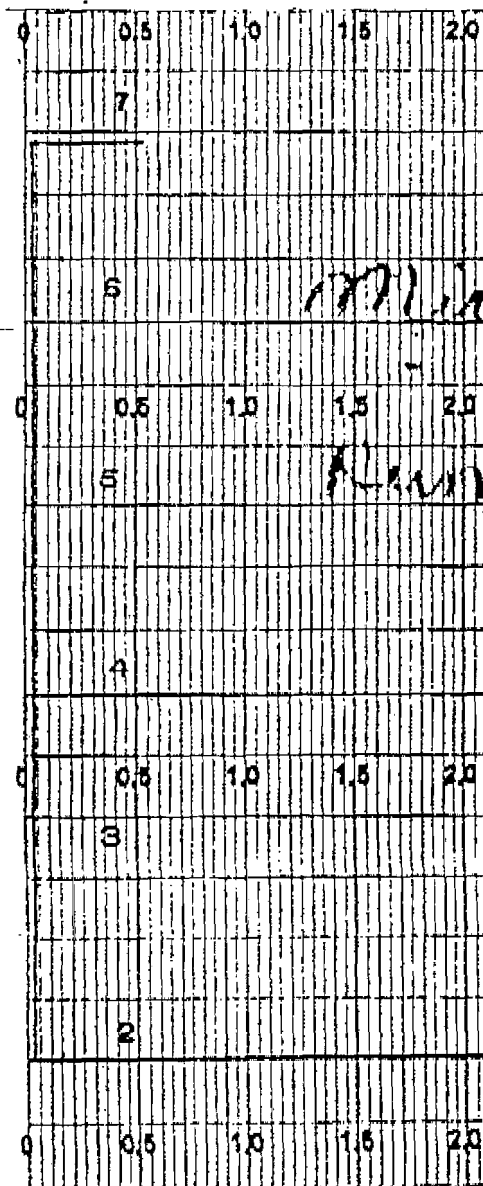
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Appendix Sheet 5

SMOKE DENSITY CURVES

TYPICAL TEST SPECIMEN



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Appendix Sheet 6

OFOQ9.AC

PRODUCT IDENTIFICATION MARK TO BE USED BY MANUFACTURER:

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SPECIFICATION TESTED PER ASTM E-84 (79a) TEST METHOD
FM REPORT J.I. OFOQ9.AC

MIRACO, INC.
MIRACOTE COATING MATERIAL

FIRE TEST RESULTS

Applied to 1/4 inch (6.35 mm) Thick Asbestos-Cement Board
at a .075 inch (1.9 mm) Nominal Thickness
ASTM E-84 (79a)

Flame Spread --- 5
Smoke Developed --- 0

THESE NUMERICAL VALUES ARE NOT INTENDED TO REFLECT HAZARDS
OF THIS MATERIAL UNDER ACTUAL FIRE CONDITIONS.

FACTORY MUTUAL AUDIT INSPECTION AND RE-EXAMINATION PROGRAM
RELATES ONLY TO THE ABOVE.
