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PROJECT REPORT

TEXTILE FIBERS - DYNEL TECHNICAL SERVICE
ASTM E162 RADIANT PANEL AND NBS SMOKE DENSITY TESTS

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SUPERVISOR: F. H. Small

DATE: March 12, 1974

PROJECT NO.: 797B15

FILE NO.: 19281

INFORMATION RETRIEVAL
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At the request of Mr. D. J. Posten of Dr. G. M. Bryant's Group, three samples of mastics on 1/4-inch asbestos-cement board from the Vimasco Corporation, Nitro, W. Va. were evaluated in the ASTM E162 Radiant Panel Test and the NBS Smoke Density Chamber to observe the effect of flame spread and smoke density of reinforcing fabrics with a mastic to be used as a weather barrier for insulations.

The radiant panel data are presented in Table I, while the NBS smoke density data are presented in Table II. Sample WC-1-FR is the mastic only, the second sample is WC-1FR with Glassfab fabric, and the third sample is WC-1FR with Elastifab 894 reinforcing fabric. The data will be interpreted by Mr. Robert Montague of the Vimasco Corporation.

For the radiant panel test, the flame spread factor (Fs) is a measure of the rate of flame travel over the exposed surface and is calculated from the time required for the flame front to reach successive marks three inches apart along the length of the speciman. Heat evaluation factor (Q) is a measure of the heat generated from combustion of the material and is calculated from the temperature rise recorded by thermocouples on the stack of the equipment. The flame spread index is the product of Fs and Q. Four specimens of each sample were tested and the values averaged.

For the NBS smoke density chamber, Dm is the maximum specific optical density, Dm(corr.) is the maximum specific optical density corrected for smoke deposited on the exposed surfaces of the photoelectric system, and Ds = 16 is a critical density representing the smoke level at which a typical occupant in a typical room would find his escape hindered by smoke. Three specimens were tested in each mode, non-flaming and flaming, with the values averaged for each mode.

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The apparatus and procedures for the ASTM E162 radiant panel test and the NBS smoke chamber test have been fully described in earlier publications (1,2).

BIBLIOGRAPHY

(1) Am. Soc. Testing and Materials, ASTM E-162-67, ASTM Std., 14, 500-511 (November, 1970).

(2) Hilado, C. J., "National Bureau of Standards Smoke Density Tests", R/D Department, File No. 13337, February 26, 1970.

REFERENCE: 89CJH69, 106CJH1-18

Attahments:
2 Tables

Manuscript Date: 2-20-74
Date Typed: 2-28-74
ESH:dww

E. S. Hammack

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TABLE I

TEXTILE FIBERS - DYNEL TECHNICAL SERVICE
ASTM E-162 RADIANT PANEL TESTS
VIMASCO CORPORATION

Sample Reference	Test No.	Fs	Q	Is
WC-1 FR	1	6.47	3.91	25.27
	2	5.76	4.69	26.25
	3	5.97	2.34	13.99
	4	5.54	1.56	8.66
Average		5.94	3.12	18.54
WC-1-FR w/Glassfab	1	6.88	5.47	37.63
	2	5.54	5.47	30.30
	3	8.69	3.12	27.16
	4	6.00	3.91	23.44
Average		6.78	4.49	29.63
WC-1-FR w/Elastafab 894	1	6.56	6.25	40.67
	2	6.00	2.34	14.06
	3	6.56	4.69	30.75
	4	5.65	7.03	39.73
Average		6.19	5.08	31.30

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TEXTILE FIBERS - DYNEL TECHNICAL SERVICE
VIMASCO CORPORATION
NBS SMOKE DENSITY TESTS

Sample Reference	Mode	Dm	Dm(corr.)	Time to 0.9 Dm (min.)	Time to DS = 16 (min.)
WC-1-FR	non-flaming	232.17	226.78	5.78	1.05
		196.69	193.76	5.37	0.87
		240.76	235.37	6.06	1.08
Average		223	219	5.74	1.00
	flaming	252.74	242.78	3.16	0.70
		252.74	243.79	2.59	0.66
		248.17	237.52	3.05	0.72
Average		251	241	2.93	0.69
WC-1-FR w/Glassfab	non-flaming	162.71	154.75	6 24	0.80
		195.81	189.15	5.89	0.83
		231.18	209.14	7.41	0.92
Average		196	184	6.51	0.85
	flaming	228.00	219.38	2.25	0.66
		204.32	197.02	1.97	0.57
		205.35	197.39	2.27	0.53
Average		212	205	2.16	0.59
WC-1-FR w/Elastafab 894	non-flaming	176.58	174.25	5.33	0.90
		473.96	459.76	3.24	1.25
		239.61	233.59	4.92	0.94
Average		297	289	4.50	1.03
	flaming	340.14	332.18	3.50	0.68
		273.12	267.73	2.34	0.52
		303.92	297.58	2.54	0.66
Average		306	299	2.79	0.62

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In Mullen Fire Room
IV B3c3 Refractory
Barrier Ceiling K9D

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PROJECT REPORT

RADIANT PANEL TESTS ON MASTIC COATINGS

AUTHORS: C. J. Hilado

SUPERVISOR: F. H. Small

DATE: March 22, 1974

PROJECT NO.: 322I22

FILE NO.: 19325

Thirteen samples of mastic coatings applied on asbestos-cement board were evaluated in the ASTM E 162 radiant panel test at the request of Mr. R. W. McLaughlin. The mastic coatings are described in Table I. Three of the samples were UCC formulations based on UCAR latexes, and ten were commercial coatings.

Test results are presented in Table II and will be interpreted by Mr. McLaughlin. Flame spread factor (Fs) is a measure of the rate of flame travel over the exposed surface, and is calculated from the times required for the flame front to reach successive marks three inches apart along the length of the specimen. By this calculation, Fs is equal to 1.0 when the flame front does not reach the first 3-inch mark. Heat evolution factor (Q) is a measure of the heat generated from combustion of the material, and is calculated from the temperature rise recorded by thermocouples mounted in the stack. The flame spread index (Is) is the product of Fs and Q.

The ASTM E 162 radiant panel test is intended to measure surface flammability for research and development purposes, and is not a fire hazard standard. Care should therefore be exercised in utilizing this information to determine fire hazard.

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CJH:jes
Manuscript Date: March 15, 1974
Date Typed: March 20, 1974

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