

SMALL SCALE ASTM E119
FIRE RESISTANCE TESTING
FOR TPR² CORPORATION ON
16 MILS OF FLEXIBLE FIRE SHELL
INTUMESCENT COATING (AFES) OVER 4" THICK
PROFOAM BRAND POLYURETHANE INSULATION FOAM
VTEC #100-2594
TESTED: JANUARY 16, 2007
REVISION 3.0: AUGUST 20, 2007



VTEC Laboratories Inc.

March 7, 2007

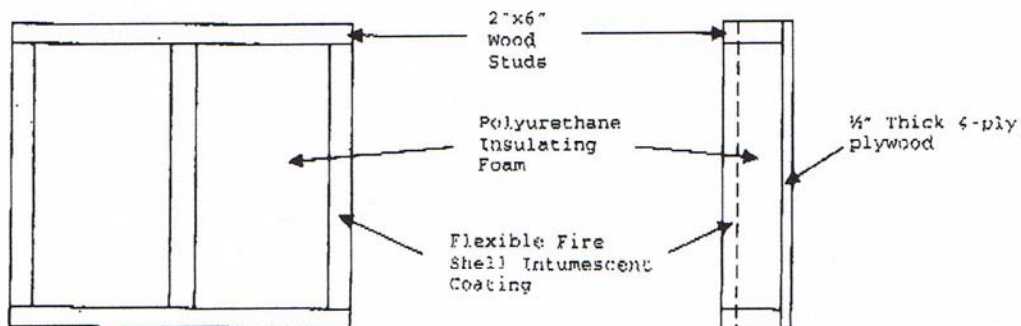
Client: TPR² Corporation
161 Interstate Lane
Waterbury, CT 06705

Attn: Mr. Richard J. Barone Jr.

Subject: Fire Resistance Testing According to ASTM E119

SAMPLE DESCRIPTION: Wall Panel with 16 mils Flexible Fire Shell Intumescent Coating (AFES) over 4" Thick Profoam Brand Polyurethane Insulating Foam.

The 36"x36"x5.5" thick single sheathed ½" plywood wall panel was fabricated and coated by TPR² for ASTM E 119 fire endurance testing. The wall was made up of 5 pieces of 2"x6" wood studs, 4 pieces forming a 36"x36" square frame and the fifth piece placed 18 inches from one side of the frame. One piece of 36"x36" ½" thick 4-ply plywood was attached to one side of the frame. The cavity in the frame between the plywood was filled with 4" thick Polyurethane Insulating Foam. The Flexible Fire Shell Intumescent Coating (AFES) was applied to the opposite side of the plywood, on top of and covering the exposed Polyurethane Insulating Foam and wood studs at an average thickness of 16 mils dry. The wall panel was oriented so that the center stud was vertical and the plywood was facing away from the furnace.



PROCEDURE:

The furnace used in this test measures 3ft x 3ft x 3ft. The outside construction is steel and the furnace is lined with a ceramic refractory insulation. The furnace dimensions inside the insulation are nominally 27" x 27" x 27".

A single burner is centered vertically in the wall opposite the sample. This burner is rated for 1.5 million Btu/hr and is of the flat flame or non-impinging flame design. Furnace conditions are monitored by three Inconel-sheathed chromel-alumel thermocouples. These thermocouples are positioned 6" from the face of the sample.

The sample was oriented vertically in the front opening of the furnace. The unexposed surface temperature of the sample was monitored by six, 20-gauge type K, fiberglass sheathed thermocouples. An insulating pad was placed over each thermocouple on the unexposed side of the sample.

The fire test was run following the ASTM E119 time-temperature curve.

The endpoint for the ASTM E 119 test occurs when either all the thermocouples on the sample reach an average of 250°F + ambient starting temperature, any individual thermocouple on the sample exceeds 325 °F + ambient starting temperature, or when the sample experiences burn-through.

RESULTS:


The ambient temperature was 63°F.

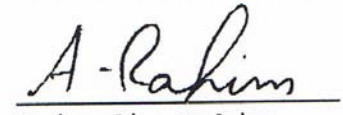
At 14 minutes smoke began to emit from the sample.

At 16 minutes thermocouple #1 exceeded 388 °F thus indicating failure.

At 17 minutes the average for all six thermocouples on the unexposed side exceeded 313 °F and thermocouple #4 exceed 388°F thus reaching a second failure criteria.

The time-temperature data are contained on the following pages.

 Rev 3.0
Neil Schultz
Executive Director


Amirudin Rahim
Technical Director

REVISION 3.0: Corrected Sample Description.

DISCLAIMER: This test should be used to measure and describe the properties of materials, products or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazards or fire risks of materials, products or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment, which takes into account all of the factors that are pertinent to an assessment of fire hazard of a particular end use.

Notice: VTEC Laboratories Inc. will not be liable for any loss or damage resulting from the use of the data in this report, in excess of the invoice. This report pertains to the sample tested only. Such report shall not be interpreted to be a warranty, either expressed or implied as to the suitability or fitness of said sample for such uses or applications, as the party contracting for the report may apply such sample.

VTEC Labs. 100-2594 REV. 3.0 TPR2 - Flexible Fire Shell Intumescent Coating (AFES) over Polyurethane Insulating Foam

Time (mins.)	Sample 1 deg F	Sample 2 deg F	Sample 3 deg F	Sample 4 deg F	Sample 5 deg F	Sample 6 deg F	Furnace deg F	Furnace deg F	Furnace deg F	Sample Average	Furnace Average
0	63	61	63	63	63	64	66	61	66	63	64
1	63	61	63	63	63	64	253	254	244	63	250
2	63	61	62	63	63	64	439	448	422	63	436
3	63	61	62	63	63	64	625	641	599	63	622
4	63	61	62	63	63	64	812	834	777	63	808
5	63	61	62	63	63	64	998	1027	955	63	993
6	62	61	62	63	63	64	1058	1085	1013	63	1052
7	63	61	62	63	63	64	1118	1143	1072	63	1111
8	63	61	62	63	63	64	1178	1201	1130	63	1170
9	62	61	62	63	63	64	1238	1259	1189	63	1229
10	70	61	63	63	62	64	1298	1317	1248	64	1288
11	109	61	68	67	63	64	1319	1341	1273	72	1311
12	166	65	91	99	63	75	1340	1365	1298	93	1334
13	234	76	131	165	94	104	1360	1388	1324	134	1357
14	291	95	175	245	135	141	1381	1412	1349	180	1361
15	353	116	217	299	181	181	1402	1435	1374	224	1404
16	451	137	254	351	239	221	1414	1443	1387	276	1414
17	586	159	277	422	283	264	1425	1450	1400	332	1425

January 16, 2007

75