



R W Building Consultants, Inc.

Consulting and Engineering Services for the Building Industry

P.O. Box 230 Valrico, FL 33595 Phone 813.659.9197 Facsimile 813.754.9989

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Report No. EQ-E84-05-04

Date: October 6, 2008

Evaluation of Equivalence of ASTM E84-05 to ASTM E84-04

ASTM E84-04

Conditioning:

Condition specimens to a constant weight at the temperature and humidity stated below:

73.4±5°F

50±5%RH

Test Specimen:

20" to 24" wide x 24'±1/2" long, butted against vent end of chamber.

Continuous length or joined end-to-end.

Truly representative of the materials for which results are desired.

Upstream end of chamber shall have a 14" ±1/8" length of 16 gauge steel sheet placed on the specimen mounting ledge in front of and under the leading edge of the specimen.

Test Atmosphere:

73.4±5°F

50±5%RH

Procedure:

1. Establish draft reading of 0.055 to 0.100 in. of water column
2. Arithmetic average air velocity within the furnace, at 73.4±5°F, shall be 240±5 FPM.
3. Place the specimen in the chamber and place the removable top in position over the specimen.
4. With draft operating, keep the specimen in place for 120±15 seconds prior to applying test flame.
5. Ignite gas (natural or methane) burner adjusted to 5,000 Btu/Min.
6. Record flame front travel distance versus time at 30 second intervals or each 2' of flame front travel.
7. Record smoke density photocell at 15 second intervals.

ASTM E84-05

Conditioning:

Condition specimens to a constant weight at the temperature and humidity stated below:

73.4±5°F

50±5%RH

Test Specimen:

20" to 24" wide x 24' (+12" -6") long. When >24', butted against vent end of chamber. When ≤ 24', overlap 1" on steel plate.

Continuous length or joined end-to-end.

Truly representative of the materials for which results are desired.

Upstream end of chamber shall have a 14" ±1/8" length of 16 gauge steel sheet placed on the specimen mounting ledge in front of and under the leading edge of the specimen.

Test Atmosphere:

73.4±5°F

50±5%RH

Procedure:

1. Establish draft reading of 0.055 to 0.100 in. of water column
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6. Record flame front travel distance versus time at 30 second intervals or each 2' of flame front travel.
7. Record smoke density photocell at 15 second intervals

ASTM E84-04 Continued

Procedure continued:

8. Plot flame spread distance, temperature and change in smoke density photocell readings separately.
9. Flame spread distance = observed distance minus 4.5 feet.

Flame spread index(FSI) calculation:

1. Determine the total area (A_T) under the flame spread distance-time graph.
2. When $A_T \leq 97.5$ ft-min., $FSI = 0.515 A_T$.
3. When $A_T > 97.5$ ft-min, $FSI = 4900/(195 - A_T)$.

Smoke developed index calculation:

1. Determine the total area (A_T) under the smoke density - time graph for the specimen.
2. Determine the total area ($A_{Red-Oak}$) under the smoke density - time graph for the Red-Oak.
3. Smoke developed index = $(A_T / A_{Red-Oak})$ times 100, then rounded to nearest multiple of 5.

ASTM E84-05 Continued

Procedure continued:

8. Plot flame spread distance, temperature and change in smoke density photocell readings separately.
9. Flame spread distance = observed distance minus 4.5 feet.

Flame spread index(FSI) calculation:

1. Determine the total area (A_T) under the flame spread distance-time graph.
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3. When $A_T > 97.5$ ft-min, $FSI = 4900/(195 - A_T)$.

Smoke developed index calculation:

1. Determine the total area (A_T) under the smoke density - time graph for the specimen.
2. Determine the total area ($A_{Red-Oak}$) under the smoke density - time graph for the Red-Oak.
3. Smoke developed index = $(A_T / A_{Red-Oak})$ times 100, then rounded to nearest multiple of 5.

Accordingly, other than minor revisions of the specimen length tolerance and the addition of conditions for placement of the specimen based on length, ASTM E84-05 is equivalent to ASTM E84-04 referenced in the 2007 FBC and therefore meets the intent of the code.



Lyndon F. Schmidt, P.E.
FL P.E. #43409