

November 20, 2017

Standards Equivalency Determination

Reference: White Rigid Poly Vinyl Chloride (PVC) Exterior Profile Extrusions for use in Simonton Products, ETC Laboratories Report #ETC-97-264-4091.0

I have performed an evaluation of the testing performed by ETC Laboratories in Rochester, NY in their test report ETC-97-264-4091.0. The testing was performed for AAMA and used for general qualification of white PVC material due to testing multiple manufacturers and documenting similar performance, and is therefore being submitted to qualify white colored PVC extrusions used in Simonton products. This is the same testing used for Miami-Dade material Master Files, the current basis for AAMA-certified extruders in the HVHZ. This report is based on older or different versions of the various ASTM standards than those referenced in the Miami-Dade Checklist #0445 and Florida Building Code 5th Edition (2014) and 6th Edition (2017); therefore I analyzed the standards for equivalency and current code compliance. Please see the table below for the findings:

As-Tested in ETC-97-264-4091.0	As-Required in Checklist #0445 / FBC 5 th Edition (2014) / FBC 6 th Edition (2017)	Equivalent / Meets FBC 5 th and 6 th Ed.?
ASTM D1929-96 Ignition Temperature, with samples tested showing an average ignition temp. of 925°F	ASTM D1929-96(2001)e1 and -12 (these versions compared to the 96 version have only formatting and editorial revisions not affecting the technical aspects of the standard), with required results of ignition temp. > 650°F	Yes
ASTM D2843-93 Smoke Density, with samples tested showing an average smoke density value of 43	ASTM D2843-99(2004)e1 and -10 (these versions compared to the 93 version have identical standard test sample size, burner assembly and pressure, chamber size, test duration, and photometric and timing equipment. The primary difference is the heat shield below the burner in '93 was specified as asbestos and in '10 is specified as calcium silicate; in my judgement this does not functionally affect the test results.) with required results of smoke density <= 75	Yes

ASTM D635-96 Rate of Burning, with samples tested all achieving a combustibility classification of Class C-1 (burn rate $\leq 1''$)	ASTM D635-06 and -10 (these versions compared to the 96 version have identical test duration, sample and flame size and orientation, and test apparatus, except that the wire gauze in these versions is positioned more directly under the test sample to catch falling embers, which does not affect the rate of burning), with required results of Class C-1/CC1 or C-2/CC2	Yes
ASTM G26-95 Method A Xenon UV Exposure, with testing protocols of 6500W lamp, daylight filter (0.35 W/m ² *nm @ 340nm), 4500 hours, intermittent water spray.	ASTM G26 or G155 per Checklist, ASTM G155-05a/D2565-99(2008) per FBC: Testing complies explicitly with G26. G155/D2565 also requires 6500 W lamp, daylight filter (0.35 W/m ² *nm @ 340nm), 4500 hours, however FBC does not require water spray. Intermittent water spray represents more stringent "torture test" of product.	Yes
ASTM D638-96 Tensile Test after G26 test exposure, with samples tested showing an average of 4.98% difference in Yield Strength between exposed and unexposed samples	ASTM D638-03 (this version compared to the 96 version has identical prescribed dog-bone geometry and tolerances, environmental pretreat and test conditions, and test speed per Table 1 of standard), with required results of change in Yield Strength of < 10%	Yes

Based on these assessments, the testing performed in ETC-97-264-4091.0 is compliant with FBC 5th Edition (2014), 6th Edition (2017) and Miami-Dade Checklist #0445 for the standards tested.

An additional standard that is referenced in the FBC 5th Edition (2014) Section 2614.2 and FBC 6th Edition (2017) Section 2615.2 Approved Plastic definition, but not in the Checklist #0445, is impact testing on the samples per ASTM D256 (pendulum test) after the UV exposure. This testing is not prescribed in the Checklist #0445 because it is felt that it does not help to characterize performance changes in the samples for non-exposed vs. exposed samples, and that only the ASTM D638 testing is meaningful in this regard. As such, ASTM D256 testing was not performed in ETC-97-264-4091.0. However, an impact drop test per ASTM D4226 is performed after 6, 12, and 24 month weathering per AAMA 303, with more stringent AAMA requirements of 5340 J/m min. brittle impact results, as a prerequisite for member participation in the AAMA Fenestration Exterior Thermoplastic Profile Certification program. Because of this broad array of ongoing impact testing by AAMA members, after varying levels of exterior weathering, it is my recommendation that the ASTM D4226 testing be considered under FBC 5th Edition (2014) and 6th Edition (2017) Sect. 104.11 as an Approved alternative to the D256 testing requirement.

Sincerely,

LT

11/20/2017
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