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Report On  
Critical Radiant Flux of Floor-Covering Systems  
Using a Radiant Heat Energy Source  
As Determined By  
ASTM E 648 Test Method

PREPARED FOR:  
**Armstrong Flooring Inc.**  
Lancaster, PA

TEST NUMBER: FRP-1156

Rigid Core Essentials

Date of Issue:  
8/7/2019



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TL-224



**I. SCOPE**

This report contains the reference to the test method, purpose, test procedure, preparation and conditioning of test samples, description of materials, test and post test observation data, and test results.

**II. TEST METHOD**

The test was conducted in accordance with ASTM Designation E 648-19, "Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source." The test is also known as NFPA No. 253.

**III. PURPOSE**

The purpose of the test is to determine the critical radiant flux of horizontally-mounted floor covering systems exposed to a flaming ignition source in a graded radiant heat energy environment maintained in a test chamber. The specimen may be mounted over underlayment, a simulated concrete structural floor, bonded to a simulated structural floor, or otherwise mounted in a typical and representative way.

The test method provides a basis for estimating one aspect of fire exposure behavior for floor covering systems. The imposed radiant flux is designed to simulate the thermal radiation levels likely to impinge on the floors of a building whose upper surfaces are heated by flames and/or hot gases from fully developed fire in an adjacent room or compartment. The method was developed to simulate an important fire exposure component of fires which may develop in corridors or exit ways of buildings and is not intended for routine use in estimating flame spread behavior of floor covering in building areas other than corridors or exit ways.

**IV. TEST PROCEDURE**

The basic elements of the test chamber are: 1) an air-gas, fueled radiant heat energy panel inclined at 30° to and directed at 2) a horizontally-mounted floor covering system specimen. The radiant panel generates a radiant energy flux distribution ranging along the 100-cm length of the test specimen from a nominal maximum of 1.0 watts/cm<sup>2</sup> to a minimum of 0.1 watts/cm<sup>2</sup>. The test is initiated by open flame ignition from a pilot burner. The distance burned to flame-out is converted to watts/cm<sup>2</sup> and reported as **critical radiant flux**.



**Report on Critical Radiant Flux of Floor Covering Systems Using a  
 Radiant Heat Energy Source as Determined by the ASTM E 648 Flooring Radiant Panel**

**Test Number: FRP-1156**

**Test Date: 07/26/19**

<b>Report Prepared For:</b>	<b>Armstrong Flooring Inc. Lancaster, PA</b>
<b>Material Tested:</b>	<b>Rigid Core Essentials</b>

Sample Information:	
<b>Detailed Product Description:</b>	Product Category: Rigid Core; Production Date: 06/21/2019; Composition: UV cured topcoat, 12mil WL, 3.7mm core and 1mm IXPE back pad.
<b>Sample Preparation:</b>	The material was adhered to 1/4" cement board backer using Armstrong S-288 adhesive. Samples were prepared by the manufacturer.
<b>Sample Selection By:</b>	Manufacturer
<b>Number of Samples:</b>	3
<b>Surface Exposed:</b>	Surfaces (Faces Only)
<b>Average Thickness (in.):</b>	0.451
<b>Flux Profile Run Date:</b>	07/26/19
<b>Conditioning Days:</b>	4
<b>Sample Color:</b>	Brown
<b>Average Weight (lbs):</b>	9.00

Test Data			
	Burn 1	Burn 2	Burn 3
<b>Preheat Time (min):</b>	5:00	5:00	5:00
<b>Starting Temp. (°C):</b>	170	170	172
<b>Burn Length (cm):</b>	4.9	6.4	6.5
<b>Time to Max Burn Length (min):</b>	10.08	10.03	10.04

Test Results			
	Burn 1	Burn 2	Burn 3
<b>Critical Radiant Flux (W/cm2):</b>	1.00+	1.00+	1.00+
<b>Average Critical Radiant Flux (W/cm2):</b>			1.00+
<b>Standard Deviation:</b>			N/A
<b>Coefficient of Variation:</b>			N/A

<b>Observations:</b>	All Burns: Blistering during the 5 minute preheat.
<b>Remarks:</b>	Reported weights and thicknesses include the 1/4" cement board backer.
<b>Conclusions:</b>	The product is classified as Class I (Critical Radiant Flux $\geq 0.45$ W/cm <sup>2</sup> ) by NFPA 101 and Section 804.2 of the International Building Code.
<b>Test Operator:</b>	CK

Report Prepared By:

Report Reviewed By:

Laboratory Technician II - Fire

Sr. Manager of Product Testing

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