
ASTM E 648 Critical Radiant Flux Testing of "SBR RUBBER TILE"

A Report To: **AL KHALEEJ POLYMERS**
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3 Pages

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1.0 ACCREDITATION

ISO/IEC 17025 for a defined Scope of Testing by the American Association for Laboratory Accreditation (A2LA)

2.0 SPECIFICATIONS OF ORDER

Determine critical radiant flux in accordance with ASTM E 648, as per Element Quotation No. 22-002-325482 RV1 dated February 7, 2022.

2.1 History of Report Revision

This report supersedes Element Test Report No. 22-002-121, originally issued on March 29, 2022. It is revised by request to simplify performance criteria references.

3.0 SAMPLE IDENTIFICATION (Element sample identification number 22-002-S0121)

Rubber flooring material, nominally 0.78 inches (20 mm) in thickness, identified as:
 "SBR RUBBER TILE"

4.0 SUMMARY OF TEST PROCEDURE

This procedure is used to measure the critical radiant flux of horizontally-mounted floor covering systems exposed to a flaming ignition source in a graded radiant heat energy environment, in a test chamber.

The radiant panel is calibrated to yield a heat flux gradient ranging from 1.1 W/cm² at the near end of the specimen to 0.1 W/cm² at the far end of the specimen.

The floor covering system (250 x 1070 mm) is mounted in the test frame as specified by its end use (e.g. glued directly to cement board, clamped to cement board or clamped over an undercushion).

The system is admitted into the calibrated test chamber, and after a 5 minute pre-heat, is ignited by a pilot flame. The distance at which extinguishment takes place is measured, correlated with the heat flux at that point, and is reported as the critical radiant flux (CRF). This value represents the minimum radiant energy required to sustain propagation of flaming combustion along the surface of the material.

The higher the critical radiant flux, the more resistant the floor covering system is to flame propagation.

5.0 TYPICAL PERFORMANCE REQUIREMENTS

Specifier	Minimum CRF (W/cm ²)	Designated End-Use
General Services Administration (GSA)	0.45	Institutional
	0.22	Commercial
Health, Education & Welfare (USA)	0.45	Institutional
	0.22	Commercial
New York & New Jersey Port Authority	0.50	Corridors, exitways
	0.40	General areas
NFPA 130 (2020 Edition)	0.50	Rail Cars

Many Building Codes and/or authorities having jurisdiction may also refer to the following categories:

Class I	Class II	Test Result
0.45 W/cm ² or greater	0.22 W/cm ² to 0.44 W/cm ²	Class II

6.0 SAMPLE PREPARATION

The rubber tile material was tested in the free-lay configuration (no adhesive or substrate). Each specimen was conditioned at a temperature of $23 \pm 3^\circ\text{C}$ and a relative humidity of $50 \pm 5\%$ for at least 48 hours prior to testing.

7.0 SUMMARY OF TEST RESULTS

SAMPLE: "SBR RUBBER TILE"

Average Critical Radiant Flux (W/cm^2)	0.27
Standard Deviation	0.057
Coefficient of Variation	21.5

8.0 INDIVIDUAL TEST RESULTS

ASTM E 648-19ae1

Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

	Test 1	Test 2	Test 3
Distance Burned (mm)	527	645	628
Critical Radiant Flux (W/cm^2)	0.33	0.23	0.24

8.1 Observations

Smoldering was observed prior to the application of the pilot burner flame. Ignition occurred after application of the test flame. Charring behavior was observed. Post-test examination showed a loss of structure (crumbling) in the area affected by flaming.

9.0 CONCLUSIONS

With an average critical radiant flux of $0.27 \text{ W}/\text{cm}^2$, the flooring material identified in this report qualifies for use in commercial applications, as governed by the General Services Administration and Health, Education and Welfare in the United States. The flooring would be considered a Class II material by many authorities having jurisdiction.



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