

Resistance of ROCKWOOL Exterior Insulation to Ultraviolet Light

ROCKWOOL stone wool insulation products are exposed to various conditions during production, transportation and handling, as well as during and after installation. Throughout these stages, ROCKWOOL products may be exposed to Ultraviolet (UV) light. This technical bulletin addresses the impact of UV light on unfaced ROCKWOOL exterior stone wool insulation products, and on the ROCKWOOL Cavityrock® Black facer.

Impact on Unfaced Exterior Insulation

In the absence of a specific standard for mineral wool insulation, the impact of the exposure to UV light on ROCKWOOL stone wool insulation was tested and examined in a laboratory, in accordance to a modified version of standard ISO 4892-3 "Plastics - Methods of exposure to laboratory light sources - Fluorescent UV lamps," which specifies a method for exposing specimens to fluorescent UV radiation in an apparatus designed to simulate the weathering effects that occur when materials are exposed in actual end-use environments to global solar radiation.

ISO 4892-1 Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance, states that the irradiance between 300 and 400 nm is 74,6 W/m², which is representative of the maximum global solar irradiance experienced by materials exposed on a horizontal surface at the equator, near noon, on a clear day in spring or autumn; UV-A lamps with a peak of 340 nm, where the radiant emission below 400 nm is greater than or equal to 80% of its total light output, and the radiant emission below 300 nm is less than 2% of its total light output can generate this irradiance. Using the above irradiance value, the monthly exposure of a specimen to UV light is calculated as follows: 74.6 W/m² x 3600 seconds/hour x 720 hours/month ≈ 0.192 x1009 J/m²/month ≈ 0.2 GJ/m².

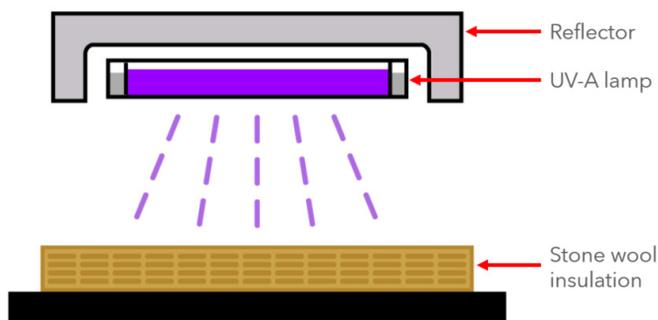


Figure 1: Schematic of the test apparatus



Figure 2: Exposed Cavityrock® during construction of RUSH University Medical Center in Chicago, IL

This monthly exposure to UV light is then translated to a number of years of natural exposure, using the recommendations from the European Organisation for Technical Assessment (EOTA) technical report no. 10: "Exposure to artificial weathering", edition May 2004. A 0.2 GJ/m² exposure corresponds to 1 year of equivalent radiation dose, meaning that 3 months of exposure to UV-A lamps with a peak of 340 nm equals to 3 years of in-situ UV exposure.

Following this test method, ROCKWOOL products were placed in test rigs with UV-A lamps approximately 5 to 10 cm above the surface of the test specimens, as shown in Figure 1.

After 3 months of exposure, the results from the testing revealed:

- No significant change in compressive strength;
- No significant impact on the overall water absorption property, despite a small increase in the outer ~1 to 2 mm of the samples;
- That the thermal resistance was generally not impacted.

Impact on the Cavityrock® Black facer

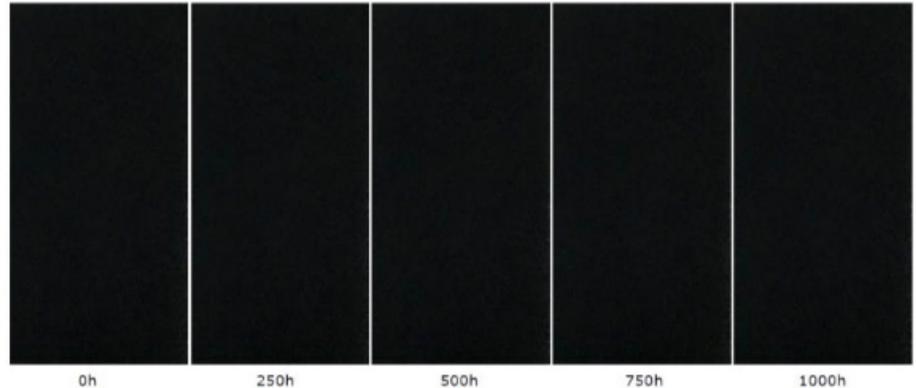
ROCKWOOL Cavityrock® Black is designed, tested, and approved for use in rainscreen systems where a black finish is preferred for aesthetic appeal, allowing any visible insulation between the cladding joints to appear black rather than the natural insulation color. Since this facer is exposed to UV light during the product's end use, it was tested in accordance to ISO 105-A02:1993 "Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in color". In this test method, the potential change in color is assessed by comparing the specimen against a grey scale (5 steps) consisting of non-glossy grey colour strips, including four half-steps.

The Cavityrock® Black facer achieved a rating of 5/5 after an exposure to UV light of 250 and 500 hours, with no perceptible change in color, and a rating of 4/5 after an exposure of 750 and 1000 hours, with no significant loss in depth, but a color slightly redder.



Figure 3: Exposed Cavityrock® Black during construction of Arizona State University in Tempe, AZ

Grey Scale		
Control	250h	5/5
	500h	5/5
	750h	4/5
	1000h	4/5



Guidance for limiting exposure

Although the short-term exposure to UV light is not expected to have a significant impact on ROCKWOOL products, ROCKWOOL insulation should be covered by the exterior cladding as soon as possible after installation, as the cladding will provide some protection to the insulation against the elements (e.g., rain, wind, and hail), physical damage and other contaminants. Should the installation of the exterior cladding not be possible immediately after installation of the insulation, ROCKWOOL recommends that the insulation be protected using a waterproof membrane such as a tarp, allowing for ventilation.



For more information about about exposure to the elements or the storage and handling of ROCKWOOL products, visit rockwool.com



To get in touch with the ROCKWOOL Technical Services team, visit rockwool.com/north-america/contact/ or call at 1-877-823-9790

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