



Hemispherical Emissivity for R+Heatshield

The hemispherical emissivity (emittance) of R+Heatshield has been determined in accordance with Section 5.6.2, annex B (ageing), and annex D (measurement method) in the CUAP for “Products with radiant heat reflective component for use in thermal insulation systems of building envelopes (wall, ceiling, floor and roof). Specimens for this study were obtained from Innovative Energy, Lowell, IN, USA in May, 2008. Two methods were used to measure the emissivity of R+Heatshield before and after the 28-day ageing period specified in ANNEX B of the CUAP.

Hemispheric reflectivity for wavelengths from 5 to 22 μm were determined for six locations on the test material using a Nicolet 560 FTIR equipped with a 102-mm diameter Labsphere infrared integrating sphere. The hemispherical reflectances that were measured include the wavelengths specified in EN 12898 (Annex A). The emissivity values were calculated using the equation contained Section 5.1 of the CUAP. The results reported for this method represent an average of six determinations. The reflectivity data for the initial and aged material measurements are attached.

Hemispherical emissivity was also determined in accordance with ASTM C 1371, Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers. The instrument used was a Model AE 1 Emissometer built by Devices and Services Company.

Specimens of R+Heatshield were exposed to a relative humidity of 90% at a temperature of 70 °C for 28 days as specified in ANNEX B of the CUAP. The hemispherical emissivity was determined after the aging period for comparison with the emissivity measured before the aging period.

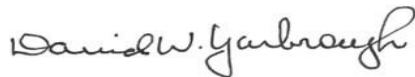
Test Results

<u>Product Tested</u>	<u>Hemispherical Emissivity</u>			
	<u>C 1371</u>		<u>Spectral Measurements</u>	
	Average	Std Dev*	Average	Std Dev**
Initial Value	0.030	0.003	0.028	0.012
After 7 days	0.035	0.005		
After 14 days	0.036	0.003		
After 28 days	0.028	0.003	0.022	0.003

*based on three measurements

**based on six measurements

The conventional report for the C 1371 measurements based on the above data is emissivity 0.03 before and after ageing. The spectral results are in agreement with the C 1371 results for emissivity. Both methods result in an observation that there was no increase in the emissivity due to the 28-day exposure to a high-humidity environment.



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President
July 22, 2008

W'length	Initial data for R+Heatshield				11-May-08	Data
	e					
5.5	0.993	0.985	0.975	0.990	0.981	0.983
6.7	0.991	0.966	0.965	0.971	0.961	0.973
7.4	0.983	0.976	0.966	0.977	0.966	0.978
8.1	0.996	0.975	0.980	0.981	0.974	0.980
8.6	0.981	0.975	0.979	0.980	0.962	0.989
9.2	0.992	0.962	0.966	0.978	0.957	0.991
9.7	0.989	0.966	0.978	0.982	0.971	0.986
10.2	0.979	0.972	0.975	0.979	0.962	0.988
10.7	0.983	0.970	0.969	0.977	0.971	0.975
11.3	0.984	0.973	0.971	0.975	0.968	0.984
11.8	0.989	0.975	0.968	0.970	0.968	0.974
12.4	0.976	0.978	0.961	0.982	0.952	0.977
12.9	0.985	0.979	0.963	0.989	0.963	0.989
13.5	0.977	0.981	0.946	0.981	0.958	0.967
14.2	0.975	0.955	0.953	0.981	0.943	0.982
14.8	0.966	0.934	0.969	1.004	0.945	0.991
15.6	0.982	0.945	0.954	0.989	0.946	0.987
16.3	0.982	0.953	0.957	0.968	0.963	0.986
17.2	0.990	0.945	0.936	0.982	0.953	0.988
18.1	0.981	0.961	0.953	0.947	0.944	0.991
19.2	0.980	1.000	0.966	0.942	0.933	1.000
20.3	0.968	0.959	0.979	0.943	0.922	1.000
21.7	0.990	0.960	0.974	0.974	0.931	0.993
23.3	0.968	0.963	0.949	0.967	0.915	1.000
	0.9825	0.967	0.964667	0.975375	0.9545417	0.9855
	0.0175	0.033	0.035333	0.024625	0.0454583	0.0145

Average of six data sets 0.028

W'length e

Data for R+Heatshield after 28 days of ageing						
	30-Jun-08					Data
5.5	0.989	0.987	0.988	0.989	0.985	0.986
6.7	0.984	0.977	0.984	0.986	0.968	0.966
7.4	0.986	0.966	0.978	0.977	0.978	0.972
8.1	0.977	0.981	0.984	0.997	0.982	0.987
8.6	0.993	0.974	0.989	0.982	0.972	0.972
9.2	0.978	0.978	0.979	0.98	0.979	0.963
9.7	0.986	0.972	1.000	0.974	0.984	0.972
10.2	0.989	0.977	0.988	0.997	0.979	0.972
10.7	0.994	0.976	0.979	0.99	0.972	0.979
11.3	0.982	0.994	0.981	0.984	0.969	0.987
11.8	0.994	0.986	0.977	0.981	0.971	0.998
12.4	0.992	0.978	0.977	0.999	0.966	0.986
12.9	1.000	0.971	0.992	0.977	0.964	0.983
13.5	0.987	0.987	0.972	0.971	0.979	0.968
14.2	0.979	0.962	0.986	0.97	0.965	0.975
14.8	0.999	0.967	0.956	0.961	0.98	0.984
15.6	1.000	0.966	0.957	0.981	0.98	0.987
16.3	0.979	0.976	0.973	0.971	0.976	0.974
17.2	0.967	0.961	0.964	1.000	0.972	1.000
18.1	0.963	1.000	0.976	0.997	0.984	1.000
19.2	0.956	0.966	0.997	0.943	0.976	0.952
20.3	0.966	0.981	0.971	0.940	0.984	0.977
21.7	1.000	0.975	0.954	1.000	0.958	0.97
23.3	1.000	0.961	1.000	0.951	1.000	0.974
	0.985	0.975792	0.97925	0.979083	0.9759583	0.9785
	0.015	0.024208	0.02075	0.020917	0.0240417	0.0215

Average of six data sets 0.022
