



Coatings Study

Thermal Emittance Evaluation of Coatings for Use as Interior Radiation Control Coatings

Especially formulated coatings and paints are used in building applications to conserve energy. A large number of products called "radiation control coatings (RCC)" are used on exterior surfaces to reduce the amount of solar energy absorbed by the surface and transported to the interior. A second class of products called "Interior Radiation Control Coating Systems (IRCCS)" are available for use on interior surfaces to reduce heat transfer from the adjacent interior air to the coated surface. Consensus standards for both product types have been developed by the American Society for Testing and Materials (ASTM). This evaluation was undertaken to determine the suitability of specific paints and coatings for use as IRCCS. The ASTM document for IRCCS ([C 1321](#), "Standard Practice for Installation and Use of Interior Radiation Control Coating Systems in Building Systems") states that an IRCCS will "normally have a far-infrared emittance of 0.25 or less". The ASTM standard also identifies the method for measuring the emittance ([C 1371](#), "Test Method for Determination of Emittance of Materials near Room Temperature Using Portable Emitters").

The standards organization, ASTM, has identified a class of coating materials, specified the controlling energy conserving property, and identified the method for measuring this property. The energy conserving property is identified as "thermal emittance" in this report. Following the lead provided by the ASTM, 16 products were tested for thermal emittance and classified as an IRCCS if the ASTM standard (thermal emittance less than 0.25) was met. The paints and coating were applied in accordance with the manufacturer's instructions and tested in accordance with ASTM C 1371 by an independent laboratory accredited by the U.S. Department of Commerce (NVLAP) for this type of measurement.

The following table contains the thermal emittances that were measured. Each of the thermal emittances in the table is an average of three measurements.

Measured Thermal Emittances for Sixteen Coatings

Product	Manufacturer/Distributor	Emittance	IRCCS
Radiance E025	Chemrex	0.23	yes
Formula A Barrier Coat #85	Hy-Tech	0.66	no
Formula A Barrier Coat #85		0.70	no
Barrier Coat #233		0.89	no
HeatShield R-20	Kwik Co.	0.90	no
Koolcoat	Pawnee Specialties	0.86	no
Radiosity 3000	Green Building Supply	0.89	no
E-Barrier	Sherwin Williams	0.36	no
Heat Bloc 75	STS Coatings, Inc.	0.22	yes
Heat Bloc-Ultra		0.195	yes
Lo/Mit-1	Solec-Solar Energy Corp	0.23	yes
Lo/Mit-2		0.23	yes
Insuladd-RBC	Tech Traders	0.59	no
Insuladd-White		0.90	no
Insuladd-White on RBC		0.86	no
Therma-Guard White	United Community Services of America	0.86	no
Therma-Guard Silver		0.57	no
Therma-Guard White on Silver		0.85	no

This study identified four products with thermal emittance less than 0.25 that satisfy the ASTM criteria for an interior coating intended to reduce radiant heat transfer to and from the coated surface.