Materials Science and Engineering Corporation

TEST REPORT

Submitted: September 15, 1989

Purpose: To evaluate the emittance and reflectance of Cerama-Seal (TEMP-COAT®)

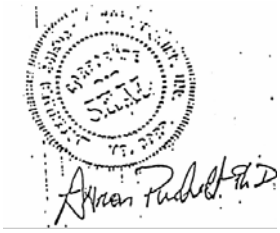
Methods: Solar Reflectance
Total Hemispherical Emittance

Results: The total solar reflectance and (r) and hemispherical emittance (E) were measured on 13 mil films sprayed on a cold rolled steel coupon at 70^{o} F .

r = 0.735 (.007)
E= 0.0050 (.004)

These measurements were made by Dr. D.W. Yarbrough at Tennessee Technological University.

Conclusion: The Cerama-Seal coating tested reflects almost 75% of solar radiation and is capable of emitting 85% of the radiation absorbed. These characteristics allow this coating to significantly reduce the surface temperature of coated substrates when exposed to solar radiation.



931 Highway 80 West, Box 1, Jackson, MS 39264

I. SUMMARY OF TES'T RESULTS

Physical Properties	Results	Test Method
Density (g/cm^3) at 24 C dried film	0.41	ASTM D-792
Weight per gallon (lb/gal)	5.94	
Weight Non-Volatiles %	43	
Accelerated Aging (no -primer)	Passed 100 hours	ASTM G-53
Aging (with primer)	200 hours	
Brookfield Viscosity #3 Spindle @ 30 rpm, centapoise	3564	
Mechanical Properties		
Cross Hatch Adhesion	5B	ASTM D-3359
Tensile Strength (lb/in^2)	66.7	ASTM D-882
Elongation (%)	65	
Flammability		
Flame spread	5	ASTM E-84
Smoke Developed	5	

Accelerated Weathering

All apparatus described in ASTM G-53 was used to simulate the deterioration caused by water as rain or dew and ultraviolet energy in sunlight. Three steel panels with approximately 13 mil coating with no primer were supplied for testing. Samples were cycled for 200 hours with each cycle consisting of 4 hours of darkness and 4 hours of U.V. exposure. Test panels were checked every 50 hours. After 200 hours the panels were removed and inspected. The panel showed no chalking, blistering or loss of adhesion. All the panels did have areas of reddish brown discoloration resulting from corrosion of the substrate which appeared at 100 hours. Overall, the mechanical and physical properties of the coating appear to be unaffected by this exposure.

A second set of measurements were run on three steel panels which had been coated with an anti-corrosive primer and 15 mils of Cerama Seal. These panels passed 200 hours exposure without any visual effect.

Cross Hatch Adhesion

The adhesion of Cerama-Seal was measured using ASTM D-3359 on coated steel panels supplied. The coating thickness was between 13 and 15 mils. In this method a lattice pattern of ten cuts was made in the coating to the substrate, pressure sensitive tape was applied over the lattice and then removed, and adhesion was evaluated by comparison. The results of this test were used to rate this material as a 5B using the scale given below.

5B The edges of the cuts are completely smooth; none of the squares of the lattice is detached.

4B Small flakes of the coating are detached at intersections; less than 5% of the area is affected.

3B Small flakes of the coating are detached along edges and at intersections of cuts. The area affected is 5 to 15% of the lattice.

2B The coating has flaked along the edges and on parts of the squares. The area affected is 15 to 35% of the lattice.

1B The coating has flaked along the edges of cuts in large ribbons and whole squares have detached The area affected is 35 to 65% of the lattice.

0B Flaking and detachment worse than Grade 1.

Flammability

A flammability test was conducted in accordance with the ASTM E-84 "Standard Method of Test for Surface Burning Characteristics of Building Materials" at Southwest Research Institute. The purpose of the test was to evaluate the performance of Cerama-Seal in relation to that of glass-reinforced cement board and red oak flooring under similar fire exposure. The results are expressed in terms of flame spread, smoke developed and temperature during a 10 minute exposure. The flame spread and smoke developed was determined to be 5 as compared to glass-reinforced cement board being 0 and red oak flooring being 100. A complete report is attached as Appendix B.