

412.788.1300  
412.788.1306 Fax  
<http://www.kta.com>  
e-mail: [info@kta.com](mailto:info@kta.com)



## KTA-TATOR, INC.

115 Technology Drive, Pittsburgh, PA 15275

February 19, 2010

Via Email: [tony@amcrg.com](mailto:tony@amcrg.com)

Mr. Tony Camarota  
AMCRG Corporation  
82 Bowker Street  
Norwell, MA 02106

**SUBJECT: Results of Permeability and Flexibility Testing of EPOX-Z NRG Cool Roof Coating Material; KTA-Tator, Inc. Project Number 300037R2**

Dear Mr. Camarota:

In accordance with KTA-Tator, Inc. (KTA) Proposal Number PN100041 and subsequent signed Authorization to Proceed dated January 25, 2010, KTA has analyzed the EPOX-Z NRG Cool Roof Coating material to determine the permeability and flexibility of the dried film. This report describes the testing procedures employed and contains the results of the analysis.

### **SAMPLES**

One (1) pint can labeled, "Part A, 100:35, A:B" and one (1) half pint bottle labeled, "Part B, 100:35, A:B" were received from AMCRG Corporation (AMCRG) on January 18, 2010. Information supplied to KTA indicated that the material was EPOX-Z NRG Cool Roof Coating. It should be noted that at no time did KTA personnel witness the manufacturing or sampling of the materials.

### **LABORATORY INVESTIGATION**

The laboratory investigation consisted of determining the permeability and flexibility of a coating film. The test methods and results are described below.

#### **Sample Preparation**

The two (2) components of the coating material were mixed at the specified ratio of 100A:35B. The coating material used for the permeability testing was applied to a sheet of mylar treated with a release agent. The coating material used for flexibility (elongation) testing was applied to 3" x 6" steel Q-panels. Both types of samples were permitted to cure for seven

(7) days at laboratory conditions of approximately  $70 \pm 2^\circ\text{F}$  and  $50 \pm 5\%$  relative humidity prior to testing.

### Permeability

Four (4) discs of the coating (one [1] designated as the control) were cut from the prepared free film and tested for water vapor permeability using Test Method B- Wet Cup Method of ASTM D 1653, "Standard Test Method for Water Vapor Transmission of Organic Coating Films." Each disc was sealed to a 2.25" diameter aluminum permeability cup dish filled with water. The coating discs were sealed to the cups with a series of rubber and plastic washers. The dishes were then weighed and placed in the upright position in a desiccator maintained at approximately  $23.0^\circ\text{C}$  and 10% (Condition C) relative humidity for a period of seventeen (17) days. The dishes were weighed separately at various recorded intervals, and the results plotted on the graph. The attached charts also reference the coating thickness and area of the discs. The permeance is reported in perms in Table 1, "Permeability Results."

**Table 1– Permeability Results**

Replicate ID	Perm-inch	Average Perm-inch
A	0.138	0.133
B	0.108	
C	0.152	

### Flexibility (Mandrel)

Flexibility testing was performed on triplicate panels prepared with the white coating in accordance with ASTM D 522, "Mandrel Bend Test of Attached Organic Coatings," Method A. Each panel was slowly bent  $180^\circ$  over the conical mandrel then examined visually with a 5X comparator lens for cracking along the axis of curvature. If cracking is present, it is measured and elongation calculated from the length of the cracking and coating thickness. The resistance to cracking was determined to be the smallest diameter of bend at which no cracking occurred. Since no cracking was observed on the white coated panels, the flexibility of the coating was outside the range of the conical mandrel. The elongation calculation does not provide a number when outside the testing range. The elongation value would be represented as  $> 42\%$  for this test result. Additional testing was performed using straight rods as outlined in Method B, but the results still fell outside the range of the testing equipment. No cracking was observed on the white coating when bent over a  $\frac{1}{4}$ " diameter rod.

## DISCUSSION

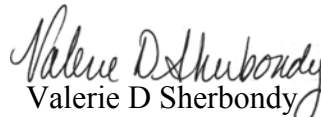
The laboratory testing revealed that the water vapor permeability of the EPOX-Z NRG Cool Roof Coating was 0.133 perm-inch. As a point of reference, other Cool Roof Coatings published permeability ratings of 5.28 perm-inches when tested using the same ASTM method (ASTM D 1653). It should be noted that, since the permeability value is not zero, water vapor can still pass through the system at a slow rate indicating some breathability of the coating. This breathability indicates that the coating is a barrier to bulk water entry, but will permit the passage of water vapor.

The flexibility testing indicated that the flexibility of the EPOX-Z NRG Cool Roof Coating is good. No exact numerical values could be established since the coating did not crack during the testing. This testing did reveal that the elongation is greater than 42%. Although an exact elongation in excess of the reported 42% could not be established, this value would indicate that the coating has the ability to flex a minimum of 42% with changes in the underlying structure.

If you have any questions or comments regarding this report, please contact me by telephone at 412-788-1300, extension 183, or by email at [vsherbondy@kta.com](mailto:vsherbondy@kta.com).

Very truly yours,

**KTA-TATOR, INC.**

  
Valerie D Sherbondy  
*Senior Chemist*

VDS/CLO:kdw  
Attachment – Permeability Results  
JN300037R2

**R2 – Company name and address corrections. Removal of acrylic references.**

*(300037R2 AMCRG.doc)*

**NOTICE:** This report represents the opinion of KTA-TATOR, INC. This report is issued in conformance with generally accepted industry practices. While customary precautions were taken to verify the information gathered and presented is accurate, complete and technically correct, this report is based on the information, data, time, materials, and/or samples afforded. This report should not be reproduced except in full.