



October 30, 2018

Email: dan@contegointernational.com

Mr. Danny French
Contego International, Inc.
7991 W 1400 North
Silver Lake, IN 46982-9676

**SUBJECT: Results of Abrasion and Impact Resistance Testing;
KTA-Tator, Inc. Project No. 380723-2**

Dear Mr. French:

In accordance with the email proposal and authorization dated September 12, 2018, KTA-Tator Inc. (KTA) has completed Taber abrasion and impact resistance testing for one coating sample. This report contains descriptions of the testing procedures employed and the results of the testing.

SAMPLES

One container of liquid coating material labeled "Date: 8/23/18; Lot No: HS-602" was received from Contego International, Inc. on September 17, 2018, and was designated as Sample KTA-1. It should be noted that at no time did KTA personnel witness the acquisition of the sample.

LABORATORY INVESTIGATION

The laboratory investigation consisted of Taber abrasion and impact resistance testing. The test descriptions and the results of the testing are provided below.

Taber Abrasion Resistance

Taber abrasion resistance was determined in accordance with ASTM D4060-14, "Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser." The coating was applied to 4" x 4" panels via draw down bar at a wet film thickness of 30 mils. The coating was allowed to cure for 22 days at ambient laboratory conditions. The panels were then weighed and subjected to 1,000 cycles using a 1,000-gram load and CS-17 abrasion wheels. Vacuum nozzle height was 4 mm, speed setting was 60 r/min, and vacuum suction setting was 100%. Post weights were acquired for the samples, and the weight loss (in mg) reported. Duplicate panels were tested, and the average weight loss was determined to be 295.4 mg.




Impact Resistance

The resistance to impact was determined in accordance with ASTM D2794-93(10), "Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)." The coating was applied to steel panels measuring 4" x 6" x 0.025" via draw down bar at a wet film thickness of 30 mils. The coating was allowed to cure for 22 days at ambient laboratory conditions ($73.5 \pm 3.5^{\circ}\text{F}$ and $50 \pm 5\%$ relative humidity). The thickness of the coating was determined according to ASTM D7091-13, "Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals," using a PosiTector® 6000 electronic dry film thickness gage. The gage was first verified for accuracy using NIST traceable plates. The measured coating thickness ranged from 15 to 20 mils.

The testing was performed with the coating facing upward (direct impact) as well as with the coating facing downward (indirect impact). A 4-pound weight for direct impact and a 2-pound weight for indirect impact was dropped from various heights along the guide tube of the apparatus onto the steel punch which rested on the coated surface of the test panel. The steel punch had a hemispherical head with a diameter of $\frac{1}{2}$ ". The location of impact was inspected under 8X magnification with a comparator lens for cracks or holidays in the coating film. A minimum of seven impact locations were observed. The maximum height (inches) at which the coating exhibited no cracking was multiplied by 4-pounds for direct impact and 2-pounds for indirect impact to determine the impact resistance of the coating in units of inch-pounds. The coating was determined to have a direct impact resistance of 40 in-lbs and an indirect impact resistance of 4 in-lbs.

If you have any questions concerning the testing or this report, please contact me by telephone at 412.788.1300 extension 182, or by email at kstanczyk@kta.com.

Sincerely,
KTA-TATOR, INC.

Kaley Stanczyk
Project Manager/Chemical Technician

KMS/RTW:edg

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