



273 Industrial Dr. ♦ Hillsdale, MI 49242 ♦ Phone: (517) 439-1485 ♦ Fax: (517) 439-1652

J&L Specialty Steel Incorporated

1200 Midland Avenue
Midland, PA 15059

ATTN: Brett Christman

GM Parts Testing

ACT Quote Number: AQT 42532
ACT Project Number: AIN 137990A

Prepared By: SED and JHC
Date Prepared: 04/15/03
Logbook: SED-7; p. 93-97

APPROVED BY:

A handwritten signature in black ink that reads "Kevin Wendt". The signature is written over a faint, light-colored rectangular stamp that contains the word "ACT" in a stylized font.

Kevin Wendt
Technical Manager



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LABORATORY TEST REPORT

ACT PROJECT AIN137990A

Evaluation #1: Visual Examination
Degree of Change: None: No change
Slight: Barely observable with normal examination
Moderate: Modest change, Readily noticeable
Pronounced: Distinct change, Easily observed with casual examination

Evaluation #2: Film Thickness
Test Method: ASTM D 1186-01

Total Film: All Coatings are Included (Including applicable non-ferrous metallic coatings)

Instrument: Fischerscope MULTI 650 C (ACT #14)

mil: 0.001 Inch

Evaluation #3: Thermal Shock for Paint Adhesion
AQT42532: Per Line Item #4 on Quotation
Material Received: 03/25/03
Test Start Date: 04/07/03
Test Complete Date: 04/08/03

Test Method: GM 9525P (09/88)

Scribing Tool: GTC #CM88 Carbide Tip

Examinations: Adhesion Loss, Distance of Loss from Scribe, and Visual examination for Degree of Change



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Thermal Shock Test Data:

| ID | Total Film (mils) | Adhesion Loss | Distance of Loss (mm) | Visual |
|-----|-------------------|---------------|-----------------------|--------|
| 740 | 0.5 | None | 0.0 | None |
| 741 | 0.5 | None | 0.0 | None |
| 742 | 0.5 | None | 0.0 | None |
| 743 | 0.5 | None | 0.0 | None |
| 744 | 0.5 | None | 0.0 | None |
| 745 | 0.7 | None | 0.0 | None |
| 746 | 0.5 | None | 0.0 | None |
| 747 | 0.5 | None | 0.0 | None |
| 748 | 0.5 | None | 0.0 | None |
| 749 | 0.6 | None | 0.0 | None |

Evaluation #4:

AQT42532:
 Material Received:
 Test Start Date:
 Test End Date:

Taber Abrasion Test
 Per Line Item #6 of Quotation
 03/25/03
 04/01/03
 04/02/03

Test Method:

GM 9515P (09/88)

Instrument:

Teledyne Taber Model 5130 (ACT #60)

Wheels:

Calibrase Wheels CS-10

Weight:

500 Grams

Examination:

Evaluate every 250 cycles and report the number of cycles to wear-through



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Taber Abrasion Test Data:

| ID | Total Film (mils) | Number of Cycles to Wear-through |
|-----|-------------------|----------------------------------|
| 790 | 0.5 | 1500 |
| 791 | 0.5 | 1500 |
| 792 | 0.6 | 1500 |
| 793 | 0.5 | 1500 |
| 794 | 0.5 | 1500 |
| 795 | 0.5 | 1500 |
| 796 | 0.5 | 1500 |
| 797 | 0.6 | 1750 |
| 798 | 0.4 | 1500 |
| 799 | 0.4 | 1500 |

Evaluation #5:
 AQT42532:
 Material Received:
 Test Start Date:
 Test End Date:

Humidity Test
 Per Line Item #7 of Quotation
 03/25/03
 04/07/03
 04/10/03

Test Methods:

GM 4465P (07/95) Deionized Water Fog

Exposure:

72 Hours Deionized Water Fog

Examinations:

Final Tape Adhesion Test per Evaluation #5a after 10 to 15 minute Recovery Period

Evaluation #5a:
 Test Method:

Tape Adhesion Test for Paint Finishes (Cross Hatch)
 GM 9071P (08/02) Method A

Number of Tests:
 Scribing Tool:
 Tape:

3 Cross Hatches per Sample after Humidity Exposure
 Gardco Model P-A-T, 1mm Spacing, Cross-Cut Tool
 3M Scotch Brand 898

Examinations:

Percent Paint Remaining and Failure Mode



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LABORATORY TEST REPORT

ACT PROJECT AIN137990A

Humidity Test Data: **72 Hours Water Fog (GM9071P Method A Adhesion)**

| ID | Total Film (mils) | % Retention | Failure Mode |
|-----|-------------------|-----------------|--------------|
| 730 | 0.6 | 100 / 100 / 100 | None |
| 731 | 0.6 | 100 / 100 / 100 | None |
| 732 | 0.5 | 100 / 100 / 100 | None |
| 733 | 0.5 | 100 / 100 / 100 | None |
| 734 | 0.6 | 100 / 100 / 100 | None |
| 735 | 0.4 | 100 / 100 / 100 | None |
| 736 | 0.5 | 100 / 100 / 100 | None |
| 737 | 0.5 | 100 / 100 / 100 | None |
| 738 | 0.5 | 100 / 100 / 100 | None |
| 739 | 0.4 | 100 / 100 / 100 | None |

Evaluation #6: Adequacy of Cure Test
 AQT 42532: Per Line Item #10 on Quotation
 Material Received: 03/25/03
 Test Start Date: 04/14/03
 Test End Date: 04/14/03

Test Method: GM 9509P (07/95)

Solvent: Methyl Ethyl Ketone (MEK)

Examinations: Observation of Painted Surface for Changes
 Observation of Rubbing Cloth for Residue
 Softening using Thumbnail
 Visual for Swelling and Loss of Adhesion

| | | | |
|---------------|---------------|-----------------------------|-------------------------|
| Rating Scale: | <u>Rating</u> | <u>Paint Surface</u> | <u>Residue on Cloth</u> |
| | 0 | No Change | None |
| | 1 | Slight-Barely Observable | Trace Amount |
| | 3 | Moderate-Readily Noticeable | Readily Noticeable |
| | 5 | Severe-Very Obvious | Saturated with Color |

**LABORATORY TEST REPORT****ACT PROJECT AIN137990A**

Cure Test Data:

| ID | Total Film (mils) | Painted Surface | | Residue on Cloth | | Softening | Visual Change |
|-----|-------------------|-----------------|-------------|------------------|-------------|-----------|---------------|
| | | Rating | Description | Rating | Description | | |
| 771 | 0.4 | 0 | No Change | 0 | None | None | None |
| 772 | 0.6 | 0 | No Change | 0 | None | None | None |
| 773 | 0.5 | 0 | No Change | 0 | None | None | None |
| 774 | 0.6 | 0 | No Change | 0 | None | None | None |
| 775 | 0.6 | 0 | No Change | 0 | None | None | None |
| 776 | 0.6 | 0 | No Change | 0 | None | None | None |
| 777 | 0.6 | 0 | No Change | 0 | None | None | None |
| 778 | 0.7 | 0 | No Change | 0 | None | None | None |
| 779 | 0.6 | 0 | No Change | 0 | None | None | None |
| 780 | 0.6 | 0 | No Change | 0 | None | None | None |