



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 Paint Performance Testing

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

Prepared By: SED and JHC  
Date Prepared: 05/07/03  
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 letters "ACT" in a stylized font.

Kevin Wendt  
Technical Manager



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**LABORATORY TEST REPORT**

**ACT PROJECT AIN137990B**

**Evaluation #1:** Nondestructive Film Thickness  
Test Method: ASTM D 1186-01 (Ferrous Substrate)  
Instrument: Fischerscope MULTI 650 C (ACT #14)  
Number of Readings: Three per Sample; Average Recorded  
Total Film: All coatings are included (including non-ferrous metallic coatings where applicable)  
mil.: 0.001 inch

**Evaluation #2:** Visual Examination  
Test Methods: ASTM D 714-02 Blister Ratings  
ASTM D 610-01 Degree of Rusting  
Blister Size Scale: 10 No Blistering  
8 Blisters Easily Seen by Unaided Eye  
6,4,2 See Photographic Standards in ASTM D 714  
Blister Frequency: N=None, F=Few, M=Medium, MD=Medium Dense, D=Dense  
Blister Pattern: Uniform, Streaks, Scattered, Patches, Edges, Along Scribe, etc.  
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



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Rust Grade Rating Scale:	<u>10</u>	Less than or equal to 0.01%
	<u>9</u>	Greater than 0.01% and up to 0.03%
	<u>8</u>	Greater than 0.03% and up to 0.1%
	<u>7</u>	Greater than 0.1% and up to 0.3%
	<u>6</u>	Greater than 0.3% and up to 1.0%
	<u>5</u>	Greater than 1.0% and up to 3.0%
	<u>4</u>	Greater than 3.0% and up to 10.0%
	<u>3</u>	Greater than 10.0% and up to 16.0%
	<u>2</u>	Greater than 16.0% and up to 33.0%
	<u>1</u>	Greater than 33.0% and up to 50.0%
	<u>0</u>	Greater than 50.0%

Rust Distribution Rating:	S:	<b>Spot Rusting</b> – Spot Rusting occurs when the bulk of the rusting is concentrated in a few localized areas of the painted surface
	G:	<b>General Rusting</b> – General Rusting occurs when various size rust spots are randomly distributed across the surface
	P:	<b>Pinpoint Rusting</b> – Pinpoint Rusting occurs when the rust is distributed across the surface as very small individual specks of rust
	H:	<b>Hybrid Rusting</b> – An actual rusting surface may be a hybrid of the types of rust distribution depicted in the visual examples (Spot, General, and Pinpoint Rusting)

**Evaluation #3:** Scab Corrosion Creepback of Paint Systems on Metal Substrates  
AQT42532: Per Line Item #9 of Quotation  
Material Received: 03/25/03  
Test Start Date: 03/31/03  
Test End Date: 04/28/03

Test Methods: GM 9511P (03/98)  
GM 9102P (09/97) Corrosion Creepback

Exposure: 20 Cycles

Examinations: Measure Total Width Creepback  
Measure Creepback from Scribe  
Visual examination for Blisters, Corrosion, and other Changes per Evaluation #2

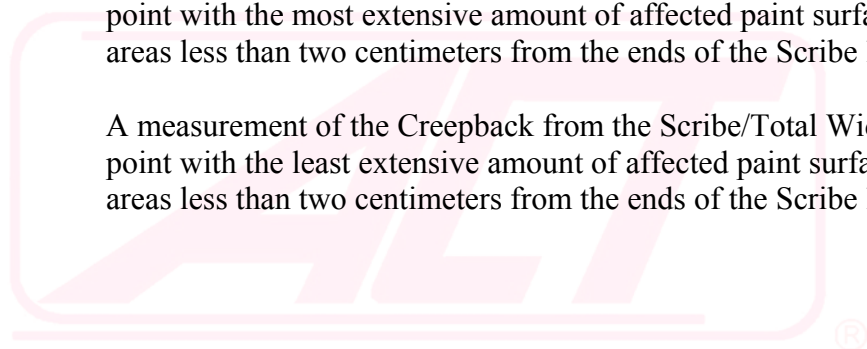


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- Total Width Creepback: A measurement of the distance (in millimeters) between the unaffected paint surfaces on each side of the Scribe line.
- Creepback From Scribe: A measurement of the distance (in millimeters) between the unaffected paint surface and the Scribe line
- Average: The mean of 4 measurements of Creepback from the Scribe/Total Width Creepback, at points 10 mm apart centered on the Scribed line. Each measurement is an average of the Creepback on two sides of the Scribe line.
- Maximum: A measurement of the Creepback from the Scribe/Total Width Creepback, at the point with the most extensive amount of affected paint surface, discounting the areas less than two centimeters from the ends of the Scribe line.
- Minimum: A measurement of the Creepback from the Scribe/Total Width Creepback, at the point with the least extensive amount of affected paint surface, discounting the areas less than two centimeters from the ends of the Scribe line.





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GM Scab Corrosion Test Data: **20 Cycles**

ID	Total Film (mils)	Total Width Creepback (mm)		
		Average	Maximum	Minimum
RR 750	0.5	0.2	0.2	0.2
RR 751	0.6	0.2	0.2	0.2
RR 752	0.6	0.2	0.2	0.2
RR 753	0.6	0.2	0.2	0.2
RR 754	0.7	0.2	0.2	0.2
RR 755	0.6	0.2	0.2	0.2
RR 756	0.6	0.2	0.2	0.2
RR 757	0.6	0.2	0.2	0.2
RR 758	0.6	0.2	0.2	0.2
RR 759	0.5	0.2	0.2	0.2

ID	Creepback from Scribe (mm)		
	Average	Maximum	Minimum
RR 750	0.0	0.0	0.0
RR 751	0.0	0.0	0.0
RR 752	0.0	0.0	0.0
RR 753	0.0	0.0	0.0
RR 754	0.0	0.0	0.0
RR 755	0.0	0.0	0.0
RR 756	0.0	0.0	0.0
RR 757	0.0	0.0	0.0
RR 758	0.0	0.0	0.0
RR 759	0.0	0.0	0.0



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GM Scab Corrosion Test Data (cont.): **20 Cycles**

ID	Rust Rating		Blister Rating			Visual Change
	Grade	Distribution	Size	Frequency	Pattern	
RR 750	9	P	10	None	None	Pronounced Staining
RR 751	5	P	10	None	None	Pronounced Staining
RR 752	9	P	10	None	None	Pronounced Staining
RR 753	9	P	10	None	None	Pronounced Staining
RR 754	9	P	10	None	None	Pronounced Staining
RR 755	9	P	10	None	None	Pronounced Staining
RR 756	9	P	10	None	None	Pronounced Staining
RR 757	9	P	10	None	None	Pronounced Staining
RR 758	9	P	10	None	None	Pronounced Staining
RR 759	4	P	10	None	None	Pronounced Staining

**Evaluation #4:** Gasoline Dip Test  
 AQT42532: Per Line Item #11 of Quotation  
 Material Received: 03/25/03  
 Test Start Date: 04/15/03  
 Test End Date: 04/16/03

Test Methods: GM 9501P (03/97) Method B

Scribing Tool: Razor Blade

Fuel: Marathon<sup>®</sup> Regular Unleaded Fuel (87 Octane)

Deviation: Time intervals of 1 hour, 4 hours, 8 hours, and 24 hours

Examination: Percent paint removed or blistered at each evaluation period



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Gasoline Dip Test Data: **Regular Unleaded Fuel (87 Octane)**

ID	Total Film (mils)	% Paint Removed			
		1 Hour	4 Hours	8 Hours	24 Hours
RR 760	0.6	0	0	0	0
RR 761	0.6	0	0	0	0
RR 762	0.4	0	0	0	0
RR 763	0.4	0	0	0	0
RR 764	0.5	0	0	0	0
RR 765	0.5	0	0	0	0
RR 766	0.5	0	0	0	0
RR 767	0.4	0	0	0	0
RR 768	0.5	0	0	0	0
RR 769	0.5	0	0	0	0

**Evaluation #5:** Cycle – Immersion Corrosion  
 AQT 42532: Per Line Item #13 on Quotation  
 Material Received: 03/25/03  
 Test Start Date: 04/25/03  
 Test End Date: 04/27/03

Test Method: GM 4359P (06/97)

Number of Cycles: 1000

Exposure Apparatus: ACT built apparatus to perform cycle exposure per GM 4359P

Examination: Visual examination for % Corrosion

% Corrosion:  $[\text{Number of 3 mm squares with corrosion} / \text{Number of squares}] \times 100$

Number of Squares per Sample: 100



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Cycle Immersion Test Data:

ID	Total Film (mils)	% Corrosion
RR 780	0.5	0
RR 781	0.4	0
RR 782	0.4	0
RR 783	0.5	0
RR 784	0.4	0
RR 785	0.4	0
RR 786	0.5	0
RR 787	0.5	0
RR 788	0.5	0
RR 789	0.4	0

