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**VENTURE TAPE CORPORATION**

30 Commerce Road  
Rockland, MA 02370-0384

ATTN: Brett Webster

Ford Pressure Sensitive Performance Testing

Test Materials: 7510 and 7514

ACT Quote Number: AQT 49377  
ACT Project Number: AIN 154314A

Reference Number: Ford ESB-M99J291-A3/A4 (01/85)

Prepared By: MWR and MDC  
Date Prepared: 11/29/04  
Logbook: MDC-8, pp. 43-53

APPROVED BY:



Kevin Wendt  
Technical Manager



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## LABORATORY TEST REPORT

ACT PROJECT AIN154314A

**Test Materials:** 7510 (Ford ESB-M99J291-A4)  
7514 (Ford ESB-M99J291-A3)

**Substrate:** ACT CRS 4" x 12" x 0.032"

**Panel Identification:** B = Phosphate: B952 P60 DIW; Unpolished  
E-coat: BASF U32AD352B  
Primer: BASF U28RW035A  
Basecoat: BASF E86WM102 Oxford White  
Clearcoat: BASF R10CG060Z

D = Phosphate: C700 C59 Immersion DIW; Unpolished  
E-coat: DuPont Cormax 6EP  
Primer: DuPont 554DM726 White  
Basecoat: DuPont 686DM640 White  
Clearcoat: DuPont RK8014 (RKS40348)

P = Phosphate: C700 C59 Immersion DIW; Unpolished  
E-coat: PPG ED6230B E-coated at PPG  
Primer: PPG FCP6514 White  
Basecoat: PPG DCT6466 White  
Clearcoat: PPG MAC8000R

**Evaluation #1:** Visual Examination Rating Scale  
**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 3.4.1:** Sample Preparation  
**Procedure:** Panel was wiped with Naphtha using a lint free cloth, then a wetting solution (5 ml Dawn dish soap to 4 L water) was applied to panel, and then panel was squeegeed.  
**Sample Preconditioning:** Samples were conditioned at  $22 \pm 1^\circ\text{C}/50 \pm 5\% \text{RH}$  for 48 hours prior to testing

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A**

**Evaluation 3.4.2:** Heat Resistance  
 AQT 49377: Per Line Item #4 of Quotation  
 Material Received: 09/08/04  
 Test Date: 11/22/04

Sample Size: 25 x 125 mm  
 Preconditioning: 2 hours after film application at 22 ± 1°C/50 ± 5% RH  
 Exposure: 30 minutes at 120 ± 2°C  
 Exposure Chamber: Cincinnati Sub-Zero Model ZH-16-2-H/AC (ACT #579)  
 Measuring Device: Mitutoyo Model #CD-6" Digimatic Caliper (ACT #115)

Evaluations: Visual examination for Cracking, Checking or Color Change per Evaluation #1  
 Initial and Final Shrinkage (M=Machine Direction, CM=Cross-machine Direction)

% Change:  $[(\text{Final} - \text{Initial}) / \text{Initial}] \times 100$

mm: Millimeter

Heat Resistance Test Data: **30 Minutes at 120 ± 2°C**

ID		Visual Examination			Shrinkage (mm)				% Change	
		Cracking	Checking	Color Change	Initial		Final		Width	Length
4B-7510	1M	None	None	None	24.8	128.5	24.8	128.4	0.0	-0.1
	2M	None	None	None	25.2	127.9	25.2	127.8	0.0	-0.1
	3M	None	None	None	24.8	128.1	24.8	128.0	0.0	-0.1
4D-7510	1CM	None	None	None	24.8	128.1	24.7	128.1	-0.4	0.0
	2CM	None	None	None	24.9	128.1	24.8	128.1	-0.4	0.0
	3CM	None	None	None	24.9	128.3	24.8	128.2	-0.4	-0.1
4B-7514	1M	None	None	None	25.1	128.0	24.9	128.0	-0.8	0.0
	2M	None	None	None	25.6	127.9	25.8	127.8	-0.8	-0.1
	3M	None	None	None	25.6	127.8	25.5	127.7	-0.4	-0.1
4B7514	1CM	None	None	None	25.9	127.0	25.8	127.0	-0.4	0.0
	2CM	None	None	None	25.3	127.6	25.2	127.3	-0.4	-0.2
	3CM	None	None	None	26.0	127.4	25.8	127.3	-0.8	-0.1

Note: Slight loss of adhesion and moderate distortion on all samples.

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A**Heat Resistance Test Data (cont.): **30 Minutes at 120 ± 2°C**

ID		Visual Examination			Shrinkage (mm)				% Change	
					Initial		Final			
		Cracking	Checking	Color Change	Width	Length	Width	Length	Width	Length
4D-7510	1M	None	None	None	25.4	128.6	25.2	128.5	-0.8	-0.1
	2M	None	None	None	24.7	128.3	24.5	128.2	-0.8	-0.1
	3M	None	None	None	25.0	128.4	25.0	128.3	0.0	-0.1
4B-7510	1CM	None	None	None	24.9	128.1	24.8	128.0	-0.4	-0.1
	2CM	None	None	None	24.8	128.5	24.8	128.3	0.0	-0.2
	3CM	None	None	None	24.7	128.2	24.7	128.1	0.0	-0.1
4D-7514	1M	None	None	None	25.1	127.8	25.1	128.0	0.0	0.2
	2M	None	None	None	25.7	127.7	25.7	127.6	0.0	-0.1
	3M	None	None	None	25.8	127.6	25.6	127.6	-0.8	0.0
4D-7514	1CM	None	None	None	25.8	125.6	25.7	125.5	-0.4	-0.1
	2CM	None	None	None	25.2	125.4	25.1	125.4	-0.4	0.0
	3CM	None	None	None	25.1	126.8	25.0	126.6	-0.4	-0.2
4P-7510	1M	None	None	None	24.8	129.0	24.8	128.9	0.0	-0.1
	2M	None	None	None	25.6	128.3	25.5	128.2	-0.4	-0.1
	3M	None	None	None	25.2	127.9	25.1	128.0	-0.4	-0.1
4P-7510	1CM	None	None	None	25.0	128.0	25.0	128.0	0.0	0.0
	2CM	None	None	None	25.0	127.9	24.8	127.8	-0.8	-0.1
	3CM	None	None	None	24.8	128.1	24.7	128.1	-0.4	0.0
4P-7514	1M	None	None	None	25.2	127.5	25.1	127.5	-0.4	0.0
	2M	None	None	None	25.5	128.6	25.4	128.4	-0.4	-0.2
	3M	None	None	None	25.0	128.2	24.9	128.1	-0.4	-0.1
4P-7514	1CM	None	None	None	25.2	125.4	25.1	125.4	-0.4	0.0
	2CM	None	None	None	25.1	127.1	24.9	127.0	-0.8	-0.1
	3CM	None	None	None	25.8	125.7	25.8	125.7	0.0	0.0

Note: Slight loss of adhesion and moderate distortion on all samples.



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**LABORATORY TEST REPORT**

**ACT PROJECT AIN154314A**

**Evaluation 3.4.4:** Resistance to Water and Soap  
AQT 49377: Per Line Item #8 on Quotation  
Material Received: 09/08/04  
Test Date: 11/18/04

Test Method: Ford FLTM BI 113-01 (03/01)

Exposure: 4 hours at 60 ± 2° C

Exposure Chamber: Cincinnati Sub-Zero Model ZH-16-2-H/AC (ACT #576)

Test Fluids: Peerless® 813 Liquid Hand Soap  
Wal-Mart® Sodium Free Distilled Water

Xenon Deviation: Xenon Arc Weatherometer used instead of Carbon Arc Weatherometer per Evaluation 3.4.4a

Evaluations: Visual examination for Dulling or Color Change per Evaluation #1

**Evaluation 3.4.4a:** Xenon Arc Activation  
AQT 49377: Per Line Item #8 on Quotation  
Material Received: 09/08/04  
Test Start Date: 11/17/04  
Test End Date: 11/18/04

Test Method Deviation: SAE J1960 (08/03)

Exposure: 16 hours

Exposure Device: Atlas Electric Devices Model Ci65A Weather-ometer (ACT #55)  
Serial Number: CB-2501

Spectral Irradiance: 0.55 ± 0.01 W/m<sup>2</sup> at 340 nm

W/m<sup>2</sup>: Watts per square meter  
nm: Nanometer

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A**

## Water and Soap Spot Test Data:

ID		Soap		Water	
		Dulling	Color Change	Dulling	Color Change
8B-7510	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
8D-7510	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
8P-7510	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
8B-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
8D-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
8P-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None



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**LABORATORY TEST REPORT**

**ACT PROJECT AIN154314A**

**Evaluation 3.4.5:** Acid Resistance  
 AQT 49377: Per Line Item #9 of Quotation  
 Material Received: 09/08/04  
 Test Start Date: 11/16/04  
 Test End Date: 11/17/04

Test Method: Ford FLTM BI 113-02 (03/01)

Xenon Deviation: Xenon Arc Weatherometer used instead of Carbon Arc Weatherometer per Evaluation 3.4.4a

Procedure: Parts are placed in a Xenon Weatherometer for 16 hours per Evaluation 3.4.4a to activate paint. Two milliliters of 0.5 N HCl is placed inside a 25 mm polyethylene washer attached to sample. Parts are placed in 22 ± 1°C for 4 hours. Samples are rinsed, dried and examined.

Evaluations: Visual examination for Dulling or Color Change per Evaluation #1

Acid Resistance Test Data:

ID		Dulling	Color Change
9B-7510	1	None	None
	2	None	None
	3	None	None
9D-7510	1	None	None
	2	None	None
	3	None	None
9P-7510	1	None*	Slight Yellowing on 1 of 2 Spots
	2	None*	None
	3	None	None

\* Moderate distortion on 1 of 2 spots



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**LABORATORY TEST REPORT**

**ACT PROJECT AIN154314A**

Acid Resistance Test Data (cont.):

ID		Dulling	Color Change
9B-7514	1	None	None
	2	None	None
	3	None*	Moderate Yellowing on 1 of 2 Spots
9D-7514	1	None	None
	2	None*	None
	3	None	None
9P-7514	1	None	None
	2	None	None
	3	None	None

\* Moderate distortion on 1 of 2 spots

**Evaluation 3.4.6:**

Water Resistance  
 AQT 49377: Per Line Item #10 of Quotation  
 Material Received: 09/08/04  
 Test Start Date: 11/08/04  
 Test End Date: 11/18/04

Test Method: Ford BI 104-01 (01/03) Water Immersion

Exposure: 240 hours at 32 ± 2°C

Immersion Bath: Wash Tub and Cole Parmer® Polystat Heater/Aerator

Evaluations: Visual examination for Blistering, Loss of Adhesion, Permanent Change in Color or Gloss per Evaluation #1

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A**Water Resistance Test Data: **240 Hours**

			Visual Examination		
ID		Blistering	Loss of Adhesion	Color Change	Gloss Change
10B-7510	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
10D-7510	1	Moderate	None	None	None
	2	Moderate	None	None	None
	3	Moderate	None	None	None
10P-7510	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
10B-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
10D-7514	1	Slight	None	None	None
	2	Moderate	None	None	None
	3	Moderate	None	None	None
10P-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A**

**Evaluation 3.4.7:** Salt Spray Resistance  
 AQT 49377: Per Line Item #11 of Quotation  
 Material Received: 09/08/04  
 Test Start Date: 11/08/04  
 Test End Date: 11/18/04

Test Method: Ford FLTM BI 103-01 (03/01)

Exposure: 240 Hours  
 Salt Spray Chamber: Singleton Model SCCH-24SL (ACT #1033)

Evaluations: Visual examination for Blistering, Loss of Adhesion, Permanent Change in Color or Gloss per Evaluation #1

Salt Spray Resistance Test Data: **240 Hours**

ID		Blistering	Loss of Adhesion	Visual Examination	
				Color Change	Gloss Change
11B-7510	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
11D-7510	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
11P-7510	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
11B-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
11D-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None
11P-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None



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**LABORATORY TEST REPORT**

**ACT PROJECT AIN154314A**

**Evaluation 3.4.8:** Gasoline Resistance  
 AQT 49377: Per Line Item #12 of Quotation  
 Material Received: 09/08/04  
 Test Date: 11/16/04

Exposure: 15 minutes at 20 - 25°C  
 Test Temperature: 20°C  
 Test Fluid: 30% Pharmco® A.C.S. Certified Toluene  
 70% Fisher® Scientific A.C.S. Certified Iso-Octane

Evaluations: Visual examination for Blistering, Softening, Dulling or Loss of Adhesion per Evaluation #1

Gasoline Resistance Test Data:

ID	Blistering	Softening	Dulling	Loss of Adhesion
12B-7510	1	None	None	None
	2	None	None	None
	3	None	None	None
12D-7510	1	None	None	None
	2	None	None	None
	3	None	None	None
12P-7510	1	None	None	None
	2	None	None	None
	3	None	None	None
12B-7514	1	None	None	None
	2	None	None	None
	3	None	None	None
12D-7514	1	None	None	None
	2	None	None	None
	3	None	None	None



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**LABORATORY TEST REPORT**

**ACT PROJECT AIN154314A**

Gasoline Resistance Test Data (cont.):

ID		Blistering	Softening	Dulling	Loss of Adhesion
12P-7514	1	None	None	None	None
	2	None	None	None	None
	3	None	None	None	None

**Evaluation 3.4.9:**

AQT 49377: Chip Resistance of Coatings  
 Material Received: Per Line Item #14 of Quotation  
 Test Start Date: 09/08/04  
 Test End Date: 11/19/04  
 11/23/04

Test Method: SAE J400 (11/02) Chip Resistance, Method II

Test Apparatus: QGR Gravelometer (ACT #98)

Test Temperatures: Ambient  
 -30 ± 2°C

Exposure Chamber: Tonka Walk-in Freezer (ACT #369)

Air Pressure: 70 ± 3 psi Air Pressure

Gravel Amount: 2.4 Liters

Gravel: Water worn road gravel which passes through a 16 mm (5/8 in.) space screen, but is retained on a 9.5 m (3/8 in.) space screen.

Evaluation: Rate per pictorial standards per SAE J400, Method II  
 Visual examination for Rupture

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A**

Chip Rating Scale:

Number Categories for Chip Rating	
Rating #	# of Chips
10	0
9	1
8	2-4
7	5-9
6	10-24
5	25-49

Rating #	# of Chips
4	50-74
3	75-99
2	100-150
1	150-250
0	>250

Size Categories for Chip Rating	
Letter	Categories for Chip Rating
A	< 1 mm
B	1-3 mm
C	3-6 mm
D	> 6 mm

Chip Resistance Test Data: **Ambient -Tape Under Topcoat**

ID	Rating	Ruptured (Y/N)
14B-7510	1U	5B No
	2U	5B No
	3U	5B No
14D-7510	1U	5A No
	2U	5A No
	3U	5A No
14P-7510	1U	4A No
	2U	4A No
	3U	4A No
14B-7514	1U	5A No
	2U	6A No
	3U	6A No
14D-7514	1U	6A No
	2U	6A No
	3U	6A No
14P-7514	1U	5B No
	2U	5A No
	3U	5A No

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A****Chip Resistance Test Data: -30°C - Tape Under Topcoat**

ID	Rating	Ruptured (Y/N)	
14B-7510	4U	5A	No
	5U	5A	No
	6U	5A	No
14D-7510	4U	6A	No
	5U	7A	No
	6U	6A	No
14P-7510	4U	2A	No
	5U	2A	No
	6U	1A	No
14B-7514	4U	6A	No
	5U	6A	No
	6U	6A	No
14D-7514	4U	7A	No
	5U	8A	No
	6U	7A	No
14P-7514	4U	5A	No
	5U	5A	No
	6U	5A	No

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A**Chip Resistance Test Data: **Ambient - Tape Over Topcoat**

ID		Rating	Ruptured (Y/N)
14B-7510	1	10	No
	2	10	No
	3	9A	Yes
14D-7510	1	10	Yes
	2	10	Yes
	3	10	Yes
14P-7510	1	10	Yes
	2	10	No
	3	10	Yes
14B-7514	1	10	No
	2	10	No
	3	10	No
14D-7514	1	10	No
	2	10	No
	3	10	No
14P-7514	1	10	No
	2	10	No
	3	10	No

**LABORATORY TEST REPORT****ACT PROJECT AIN154314A**Chip Resistance Test Data: **-30°C-Tape Over Topcoat\***

ID	Rating	Ruptured (Y/N)
14B-7510	4	Yes
	5	Yes
	6	Yes
14D-7510	4	Yes
	5	Yes
	6	Yes
14P-7510	4	Yes
	5	Yes
	6	Yes
14B-7514	4	Yes
	5	No
	6	No
14D-7514	4	Yes
	5	No
	6	Yes
14P-7514	4	Yes
	5	Yes
	6	No

\* Moderate adhesion loss on lower half of panel, on all samples, after gravel (loss of adhesion occurred where gravel impacted the panel); Top half of panel (not graveled) showed no signs of adhesion loss.