Ford Flat Rock Assembly Plant
Flat Rock, Michigan

Environmental Testing Program – Week of October 24, 2016

Transfer Efficiency
Booth Capture Efficiency
Oven Capture Efficiency

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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

RENEWABLE OPERATING PERMIT REPORT CERTIFICATION

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating (RO) Permit program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as described in General Condition No. 22 in the RO Permit and be made available to the Department of Environmental Quality, Air Quality Division upon request.

Source Name: Flat Rock Assembly Plant — County: Wayne

Source Address: 1 International Drive — City: Flat Rock

AQD Source ID (SRN): N0929 — RO Permit No.: MI-ROP-N0929-2011a — RO Permit Section No.: 1

Please check the appropriate box(es):

☐ **Annual Compliance Certification** (General Condition No. 28 and No. 29 of the RO Permit)

Reporting period (provide inclusive dates): From _____ To _____

☐ 1. During the entire reporting period, this source was in compliance with **ALL** terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the RO Permit.

☐ 2. During the entire reporting period this source was in compliance with all terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference, **EXCEPT** for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the RO Permit, unless otherwise indicated and described on the enclosed deviation report(s).

☐ **Semi-Annual (or More Frequent) Report Certification** (General Condition No. 23 of the RO Permit)

Reporting period (provide inclusive dates): From _____ To _____

☐ 1. During the entire reporting period, **ALL** monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred.

☐ 2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred, **EXCEPT** for the deviations identified on the enclosed deviation report(s).

☒ **Other Report Certification**

Reporting period (provide inclusive dates): From _____ To _____

Additional monitoring reports or other applicable documents required by the RO Permit are attached as described:

Air Emissions Test Report Submission for TE and CE Testing

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete.

Jeffrey Carrier	Plant Manager	734-782-7482
Name of Responsible Official (print or type)	Title	Phone Number

Signature of Responsible Official — Date: 12/15/16

Photocopy this form as needed. EQP 5736 (Rev 5/01)

1.0 Executive Summary

JLB Industries, LLC completed a compliance environmental testing program during the week of October 24, 2016 at the Ford Flat Rock Assembly Plant (FRAP) in Flat Rock, Michigan. The testing program included Transfer Efficiency (TE) and Capture Efficiency (CE) testing of the booth and ovens. Determination of TE and CE were conducted in accordance with all applicable procedures contained in USEPA document *Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light-Duty Truck Topcoat Operations* and with 40 CFR Chapter 1, Appendix A to Subpart IIII of Part 63. The test results will be used to demonstrate compliance with Auto MACT requirements and in monthly emissions compliance calculations.

Transfer Efficiency values were derived using the Lincoln Continental model vehicle, which is a newly introduced model. Personnel from the paint shop, Ford environmental staff and JLB Industries, LLC conducted the testing. These groups worked together at each stage of testing to ensure that the results were representative of production conditions. Mr. Mark Dziadosz of the MDEQ witnessed a portion of the testing.

JLB Industries used highly accurate weighing systems to determine the vehicle and panel weights before and after coating application. Calibrated volumetric flow meters, located on each applicator, were used to measure paint usage.

Material samples were collected from the paint circulation tanks directly after vehicle spray out. Determination of percent solids by weight and density was performed by Advanced Technologies of Michigan laboratories located in Livonia, Michigan.

Table 1 – Testing Results Summary

Tested Coating	Solids Transfer Efficiency (%)	Booth Capture Efficiency (%)	Oven Capture Efficiency (%)
Gray Prime		84.3%	10.5%
Black Basecoat		76.7%	13.0%
Clearcoat		48.2%	36.9%
3-Wet System (Dk Gray Prime, Black BC and CC)	81.4%		
3-Wet System (Med. Gray Prime, Burgandy BC and Tinted CC)	75.5%		
3-Wet System Average	78.5%		

2.0 Introduction

JLB Industries, LLC (JLBI) was contracted by Ford Flat Rock Assembly Plant (FRAP) to perform Transfer Efficiency (TE) and Capture Efficiency (CE) testing program on the 3-Wet paint systems at the FRAP Assembly Plant in Flat Rock, Michigan. This testing was conducted using the Lincoln Continental model during the week of October 24, 2016.

3.0 Sampling and Analytical Procedures

Transfer Efficiency Test

Transfer Efficiency testing was conducted in the 3-Wet Spraybooth #1. One test included Dark Gray Prime, Absolute Black Basecoat and Clearcoat coatings. Another test included Medium Gray Prime, Burgandy Velvet Basecoat and Tinted Clearcoat coatings. Applicator and environmental conditions were monitored to ensure that the testing accurately reflected production conditions. Measured parameters included: Vehicle weight gain, material usage, material analysis (percent solids by weight and density), applicator settings, film build and oven heat settings.

A total of eight vehicle bodies were used in testing. Three black Lincolns and three burgundy velvet vehicles were processed as normal production vehicles. One vehicle was dedicated as no-paint control in conjunction with each test. All units were production vehicles with electrocoat and sealer.

An off-line vehicle weigh station (VWS) was constructed to measure the weight of the test units before and after each painting process. Test vehicles were routed off-line and pushed into the VWS. A fixed stop was secured to assure repeatable positioning of the vehicles. Test vehicles were lifted free from their carriers by two lift-table mounted scale bases. Ultra-high molecular weight (UHMW) plastic blocks were strategically placed on the scale bases to lift the vehicle at the center of gravity locations. The UHMW blocks minimized friction loading on vehicles and scale bases.

Vehicle weights were measured several times and recorded. All test vehicles were weighed with production fixtures (door hooks and hood props) installed. The vehicle weigh station scales were calibrated using Class-F calibration weights conforming to the National Bureau of Standards handbook 105-1. A two-pound avoirdupois, Class F stainless steel weight was added periodically during pre- and post-process weighing to verify scale linearity.

Coating thickness was measured on each test vehicle to verify paint film-build was within the production specification. The data was taken with a handheld Elcometer gauge.

Coating material usage was monitored via volumetric flow measurement devices located on each applicator. A calibration/verification of each applicator was performed by FRAP personnel to ensure accurate usage measurement. Material samples of applied coatings were collected from the respective systems directly after testing. Samples were sent to Advanced Technologies of Michigan laboratories for analysis to determine density by

ASTM D1475 and weight solids content by ASTM D2369 (referenced in EPA Method 24). The laboratory results were used in calculating the Transfer Efficiency and Capture Efficiency values.

Production vehicles with paint shop sealer were prepared with e-coat and processed through the 3-Wet Spraybooth #1. A gap was placed before and after the test vehicles to prevent overspray. The test sequence for the Transfer Efficiency test was:

Black 3-Wet – Dark Gray Prime, Absolute Black Basecoat and Clearcoat

1. Test Unit ID 5116
2. Test Unit ID 6126
3. Test Unit ID 5092
4. Test Unit ID 5107 (No-paint)

Burgandy 3-Wet – Medium Gray Prime, Burgandy Velvet Basecoat and Tinted Clearcoat

1. Test Unit ID 4367
2. Test Unit ID 4292
3. Test Unit ID 4246
4. Test Unit ID 4309 (No-paint)

Capture Efficiency Tests

A panel weigh station (PWS) was assembled between the 3-Wet Spraybooths, near the exit of the basecoat controlled spray zones. Weighing locations were chosen based on the controlled zone locations as outlined below in *Diagram 1 – Panel Testing Diagram.* A precision balance with measurement capability to 0.001 gram was placed on an isolation platform inside an enclosure to minimize vibration and air movement. Three test runs were performed:

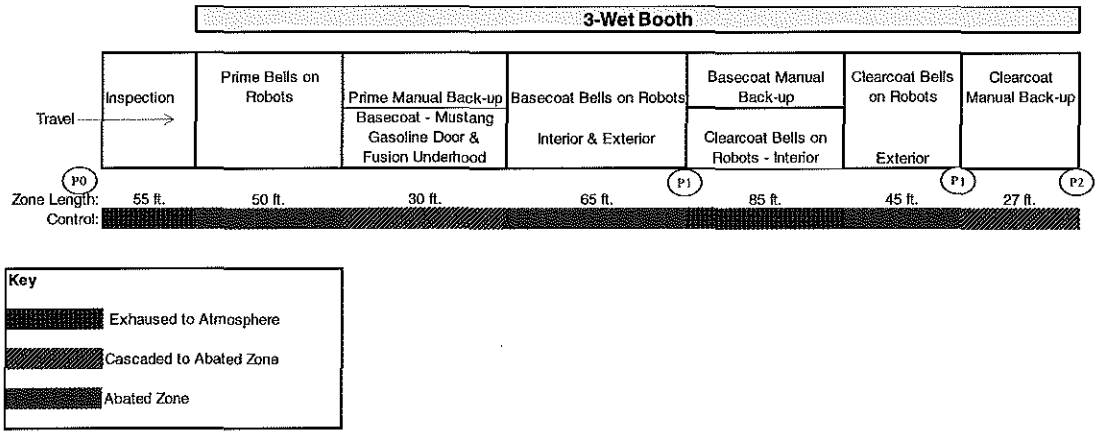
1. Prime Capture Efficiency
2. Basecoat Capture Efficiency
3. Clearcoat Capture Efficiency

The testing conformed to the methods described in ASTM 5087-02 for solvent borne coatings. Capture Efficiency values for the controlled oven and spraybooth zones were calculated using the procedures outlined in the 40 CFR, Part 63. All test panels were placed on Lincoln Continental model vehicles and processed with normal production spray programming.

Four electrocoated panels were used for each of the tests. Each group of test panels was weighed in three locations (see panel test diagram) to determine the relative distribution of VOC that is released in the controlled spray zones and bake oven. The panels were attached to test vehicles by magnet, which allowed for removal of the wet panels with minimal disturbance to the coating during handling. Panel mounting locations were chosen to achieve a representative coating film based on the observation of normal vehicle production.

Before the panels were coated, they were marked (1, 2, 3, 4, blank) and weighed to establish the initial unpainted panel weights (P0). The panels were then attached to a test vehicle and routed through the Spraybooth. For Booth Capture tests, panels were carefully removed from the test vehicle and brought to the balance for weighing after coating, upon exiting the controlled spraybooth zone (P1). For Oven Capture tests, panels were weighed immediately before entering the bake oven (P2). In all tests, panels were then placed on the test vehicle for travel through the curing oven. Upon exiting the oven, the panels were allowed to cool and then weighed a final time (P3).

Diagram 1 – Panel Testing Diagram



4.0 Test Equipment and Calibration

Vehicle Weigh Station (VWS)

A dedicated vehicle weigh station (VWS) equipped with two 1,000 lb. capacity scale bases was used to obtain pre- and post-process vehicle weights. The VWS is accurate to better than 0.05 pounds.

The scales were calibrated as directed by the operating instruction manual. Scales were powered up and exercised by placing 300 pounds of Class F calibration weights on each scale platform. Then, the VWS was calibrated with 600 pounds of Class F calibration weights. VWS linearity was checked using a two-pound, Class F stainless steel calibration weight. The two-pound weight was also added to each test vehicle during pre- and post-process weighing to verify scale linearity.

Material Usage

Coating material usage was monitored via volumetric flow measurement devices located on each applicator. A calibration/verification of each applicator was performed by FRAP paint personnel before testing to ensure accurate usage data. Paint usage was measured at each applicator in a graduated cylinder and compared to the expected volume. Verification data is included in section 7 of this report.

A sample of each material was taken after each test and analyzed by Advanced Technologies of Michigan. These values were used in calculating the paint solids sprayed and the transfer efficiency for each type of calculation. ASTM Method D-2369 was used to determine paint solids. ASTM Method D-1475 was used to determine paint density.

Panel Weigh Station

A panel weigh station (PWS) with measurement capability to 0.001 gram was used to measure panel weights. The balance was warmed up and then calibrated with a 300 gram test weight. The balance was tested with 300, 50, 20, 10 and 5 gram weights before commencing weighing operations. A blank panel weight was measured at the beginning of the testing program and again at the time of each subsequent panel weight measurement. The balance was placed on an isolation platform and inside an enclosure to minimize vibration and airflow at the measurement point.

5.0 Discussion of Test Results

After the initial weights were taken for the black transfer efficiency test, a scale malfunctioned. The scale was replaced before any additional weights were taken. The scale was replaced and a new group of vehicles was selected for testing.

6.0 Summary of Results

Table 2 - 3-Wet Transfer Efficiency Calculation Summary, Absolute Black
Ford FRAP, October 2016
3-Wet Booth 1

Vehicle ID	Vehicle Weight Gain (lb.)	Prime Sprayed (gal)	Basecoat Sprayed (gal)	Interior Clearcoat Sprayed (gal)	Clearcoat Sprayed (gal)
Variable:	VWG	PPS	BCPS	ICCPS	CCPS
Calculation:	(W2-W1)				
5116	3.25	0.175	0.518	0.118	0.458
5126	3.19	0.175	0.519	0.118	0.458
5092	3.24	0.175	0.518	0.118	0.458
Average:	3.23	0.175	0.518	0.118	0.458
AVWG:	**4.39**	AVWG=(avg VWG-SWL)			

Material	Avg. Paint Sprayed (gal)	Coating Density (lb/gal)	Weight Solids Fraction	Avg. Solids Sprayed (lb.)	Transfer Efficiency (%)
Variable:	APS	CD	WSF	SS	TE
Calculation:	(Avg PS)	(Method 24)	(Method 24)	(APS*CD*WSF)	(AVWG/SS)
Prime	0.175	9.22	0.5810	0.94	
Basecoat	0.518	7.83	0.4377	1.78	
Int. Clearcoat	0.118	8.35	0.5196	0.51	
Ext. Clearcoat	0.458	8.56	0.5538	2.17	
				5.39	**81.4%**

Control Vehicle Sealer Weight Loss

Vehicle ID	Vehicle Weight Gain (lb.)
Variable:	SWL
Calculation:	(W2-W1)
5107	-1.17

Table 3 - 3-Wet Transfer Efficiency Calculation Summary, Burgandy
Ford FRAP, October 2016
3-Wet Booth 1

Vehicle ID	Vehicle Weight Gain (lb.)	Prime Sprayed (gal)	Basecoat Sprayed (gal)	Interior Clearcoat Sprayed (gal)	Clearcoat Sprayed (gal)
Variable:	VWG	PPS	BCPS	ICCPS	CCPS
Calculation:	(W2-W1)				
4367	3.82	0.175	0.429	0.118	0.457
4292	3.27	0.175	0.429	0.118	0.457
4246	3.73	0.175	0.429	0.118	0.456
Average:	3.61	0.175	0.429	0.118	0.457
AVWG:	**3.65**	AVWG=(avg VWG-SWL)			

Material	Avg. Paint Sprayed (gal)	Coating Density (lb/gal)	Weight Solids Fraction	Avg. Solids Sprayed (lb.)	Transfer Efficiency (%)
Variable:	APS	CD	WSF	SS	TE
Calculation:	(Avg PS)	(Method 24)	(Method 24)	(APS*CD*WSF)	(AVWG/SS)
Prime	0.175	9.49	0.6041	1.00	
Basecoat	0.429	7.92	0.3887	1.32	
Int. Clearcoat	0.118	8.35	0.5196	0.51	
Ext. Clearcoat	0.457	8.38	0.5222	2.00	
				4.83	**75.5%**

Control Vehicle Sealer Weight Loss

Vehicle ID	Vehicle Weight Gain (lb.)
Variable:	SWL
Calculation:	(W2-W1)
4309	-0.04

Table 4 -- Prime Booth VOC Capture Efficiency
Ford FRAP, October 2016

Sample	Blank Panel Weights (g)	Wet Panel Weights - Control Zone Exit	Panel Weights - after bake (g)	Weight of Coating Solids Deposited (g)	Weight of VOC remaining after zone (g)	Weight of VOC remaining per Weight Solids Deposited (g)	Mass Fraction Solids	Mass Fraction VOC in Coating	VOC fraction remaining on Panel after Zone	Section Capture Efficiency (%)
Variable	P0	P1	P3	W_{sdep}	W_{rem}	P_m	W_s	W_{VOC}	P_{VOC}	CE
Formula				P2-P0	P1-P2	W_{rem}/W_{sdep}			$(P_m)(W_s)/(W_{VOC})$	$1-P_{VOC}$
P1	186.466	187.560	187.453	0.987	0.107	0.108				
P2	186.022	187.117	187.006	0.984	0.111	0.113				
P3	185.743	186.925	186.796	1.053	0.129	0.123				
P4	185.554	186.605	186.502	0.948	0.103	0.109				
Average	185.946	187.052	186.939	0.993	0.113	0.113	0.5810	0.4190	0.157	**84.3%**

Table 5 -- Basecoat Booth VOC Capture Efficiency
Ford FRAP, October 2016

Sample	Blank Panel Weights (g)	Wet Panel Weights - Control Zone Exit	Panel Weights - after bake (g)	Weight of Coating Solids Deposited (g)	Weight of VOC remaining after zone (g)	Weight of VOC remaining per Weight Solids Deposited (g)	Mass Fraction Solids	Mass Fraction VOC in Coating	VOC fraction remaining on Panel after Zone	Booth Capture Efficiency (%)
Variable	P0	P1	P3	W_{sdep}	W_{rem}	P_m	W_s	W_{VOC}	P_{VOC}	CE
Formula				P2-P0	P1-P2	W_{rem}/W_{sdep}			$(P_m)(W_s)/(W_{VOC})$	$1-P_{VOC}$
B1	187.219	188.330	188.070	0.851	0.260	0.306				
B2	186.022	186.980	186.771	0.749	0.209	0.279				
B3	187.120	188.134	187.898	0.778	0.236	0.303				
B4	186.019	187.215	186.935	0.916	0.280	0.306				
Average	186.595	187.665	187.419	0.823	0.246	0.299	0.4377	0.5623	0.233	**76.7%**

Table 6 -- Clearcoat Booth VOC Capture Efficiency
Ford FRAP, October 2016

Sample	Blank Panel Weights (g)	Wet Panel Weights - Control Zone Exit (g)	Panel Weights - after bake (g)	Weight of Coating Solids Deposited (g)	Weight of VOC remaining after zone (g)	Weight of VOC remaining per Weight Solids Deposited (g)	Mass Fraction Solids	Mass Fraction VOC in Coating	VOC fraction remaining on Panel after Zone	Section Capture Efficiency (%)
Variable	P0	P1	P3	W_{sdep}	W_{rem}	P_m	W_s	W_{VOC}	P_{VOC}	CE
Formula				P2-P0	P1-P2	W_{rem}/W_{sdep}			$(P_m)(W_s)/(W_{VOC})$	$1-P_{VOC}$
C1	186.385	188.938	188.246	1.861	0.692	0.372				
C2	186.598	189.304	188.579	1.981	0.725	0.366				
C3	186.560	189.103	188.421	1.861	0.682	0.366				
C4	186.131	188.616	187.962	1.831	0.654	0.357				
Average	186.419	188.990	188.302	1.884	0.688	0.365	0.5538	0.4462	0.454	54.6%

Paint Usage Data

Process	Applicator	Paint Sprayed (cc) Uncontrolled	Controlled
Clearcoat Interior	R1	107	
	R2	107	
	R3	116	
	R4	116	
Clearcoat Exterior	R1		248
	R2		254
	R3		243
	R4		249
	R5		309
	R6		0
	R7		122
	R8		309
	Total	232	1734
	Ratio	0.118	0.882

Note: Clearcoat Booth Capture Efficiency is a section capture efficiency as only the exterior application is controlled.
Booth CE is Controlled Section CE (xxx%) * The ratio of coating sprayed in the controlled section (.882) = CC Booth CE (xxx%)

Clearcoat Booth CE: 48.2%

Table 7 -- Prime Oven VOC Capture Efficiency
Ford FRAP, October 2016

Oven Solvent Loading

Sample	Blank Panel Weights (g)	Wet Panel Weights - Before Bake (g)	Panel Weights - after bake (g)	Weight of Coating Solids Deposited (g)	Weight of VOC available for abatement (g)	Weight of VOC available per volume of coating solids (lb/gal)
Variable	P0	P2	P3	W_{cos}	W_a	CL
Formula				P2-P0	P1-P2	$(W_a/W_{cos})*D_{cos}$
P1	186.466	187.540	187.453	0.987	0.087	1.00
P2	186.022	187.098	187.006	0.984	0.092	1.06
P3	185.743	186.902	186.796	1.053	0.106	1.14
P4	185.554	186.585	186.502	0.948	0.083	0.99
Average	185.946	187.031	186.939	0.993	0.092	**1.05**

Material Properties

Sample	Coating Density (lb/gal)	Mass Fraction Solids	Volume Fraction Solids	Average Film Build Thickness (mil)	VOC mass fraction	Solids Density (lb/gal)
Variable	W_c	W_s	V_s	mil	W_{voc}	D_{cos}
Formula						(Ws*Wc)/Vs
Gray Prime	9.22	0.5810	0.4716	0.75	0.4190	11.36

Capture Efficiency

Mass Fraction VOC in Coating	Coating Density (lb/gal)	Mass VOC per Volume Coating (lb/gal)	Transfer Efficiency (%)	Volume Fraction Solids	Solids Deposited per Volume Coating Sprayed	Panel Test Result (lb VOC/ gal Solids)	Oven VOC Capture Efficiency (%)
W_{voc}	D_c	VOC	TE	V_s	V_{sdep}	P	CE
		(Dc)(Wvoc)			$(V_s)(TE)$		$(P)(V_{sdep})(100)/(VOC)$
0.4190	9.22	3.863	81.4%	0.4716	0.384	1.05	**10.5%**

Table 8 -- Basecoat Oven VOC Capture Efficiency
Ford FRAP, October 2016

Oven Solvent Loading

Sample	Blank Panel Weights (g)	Wet Panel Weights - Before Bake (g)	Panel Weights - after bake (g)	Weight of Coating Solids Deposited (g)	Weight of VOC available for abatement (g)	Weight of VOC available per volume of coating solids (lb/gal)
Variable	P0	P2	P3	W_{cos}	W_a	CL
Formula				P2-P0	P1-P2	$(W_a/W_{cos})*D_{cos}$
B1	187.219	188.248	188.070	0.851	0.178	1.76
B2	186.022	186.913	186.771	0.749	0.142	1.59
B3	187.120	188.063	187.898	0.778	0.165	1.78
B4	186.019	187.127	186.935	0.916	0.192	1.76
Average	186.595	187.588	187.419	0.823	0.169	**1.73**

Material Properties

Sample	Coating Density (lb/gal)	Mass Fraction Solids	Volume Fraction Solids	Film Build Thickness (mil)	VOC mass fraction	Solids Density (lb/gal)
Variable	W_c	W_s	V_s	mil	W_{voc}	D_{cos}
Formula						$(W_s*W_c)/V_s$
Silver BC	7.83	0.4377	0.4079	0.86	0.5623	8.40

Capture Efficiency

Mass Fraction VOC in Coating	Coating Density (lb/gal)	Mass VOC per Volume Coating (lb/gal)	Transfer Efficiency (%)	Volume Fraction Solids	Solids Deposited per Volume Coating Sprayed	Panel Test Result (lb VOC/ gal Solids)	Oven VOC Capture Efficiency (%)
W_{voc}	D_c	VOC	TE	V_s	V_{sdep}	P	CE
		$(D_c)(W_{voc})$			$(V_s)(TE)$		$(P)(V_{sdep})(100)/(VOC)$
0.5623	7.83	4.403	81.4%	0.4079	0.332	1.73	**13.0%**

Table 9 -- Clearcoat Oven VOC Capture Efficiency
Ford FRAP, October 2016

Oven Solvent Loading

Sample	Blank Panel Weights (g)	Wet Panel Weights - Before Bake (g)	Panel Weights - after bake (g)	Weight of Coating Solids Deposited (g)	Weight of VOC available for abatement (g)	Weight of VOC available per volume of coating solids (lb/gal)
Variable	P0	P2	P3	W_{cos}	W_a	CL
Formula				P2-P0	P1-P2	$(W_a/W_{cos})*D_{cos}$
C1	186.385	188.938	188.246	1.861	0.692	3.31
C2	186.598	189.304	188.579	1.981	0.725	3.26
C3	186.560	189.103	188.421	1.861	0.682	3.27
C4	186.131	188.616	187.962	1.831	0.654	3.18
Average	186.419	188.990	188.302	1.884	0.688	**3.26**

Material Properties

Sample	Coating Density (lb/gal)	Mass Fraction Solids	Volume Fraction Solids	Film Build Thickness (mil)	VOC mass fraction	Solids Density (lb/gal)
Variable	W_c	W_s	V_s	mil	W_{voc}	D_{cos}
Formula						(Ws*Wc)/Vs
Clearcoat	8.56	0.5538	0.5320	1.98	0.4462	8.91

Capture Efficiency

Mass Fraction VOC in Coating	Coating Density (lb/gal)	Mass VOC per Volume Coating (lb/gal)	Transfer Efficiency (%)	Volume Fraction Solids	Volume Solids Deposited per Volume Coating Sprayed	Panel Test Result (lb VOC/ gal Solids)	Oven VOC Capture Efficiency (%)
W_{voc}	D_c	VOC	TE	V_s	V_{sdep}	P	CE
		(Dc)(Wvoc)			$(V_s)(TE)$		$(P)(V_{sdep})(100)/(VOC)$
0.4462	8.56	3.819	81.4%	0.5320	0.433	3.26	**36.9%**

7.0 Data Sheets

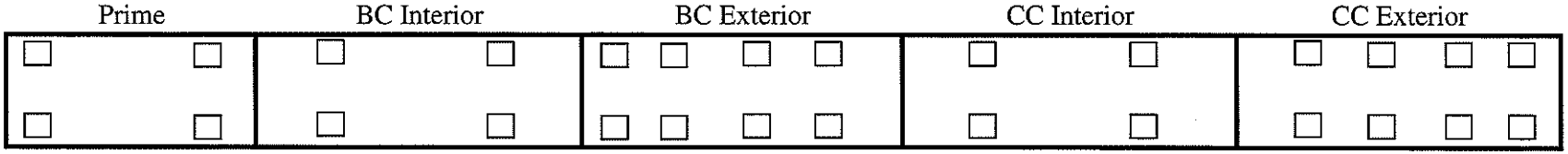
Table 10 - Applicator Parameter Summary
Ford FRAP, October 2016

3-Wet Booth

Operation	Manufacturer	Applicator	Fluid Tip	Air Cap	Gun Voltage	RPM	Target Distance	Remarks
Prime Exterior	*Fanuc*	*Versa Bell II*	*1.2 mm*	*Serrated Bell*	*80 kV*	*50,000*	*10"*	
Basecoat Interior	*Fanuc*	*Versa Bell II+*	*0.9 mm*	*Serrated Bell*	*40 kV*	*30,000*	*10"*	
Basecoat Exterior	*Fanuc*	*Versa Bell II*	*0.9 mm*	*Serrated Bell*	*80 kV*	*45,000*	*10"*	
Clearcoat Interior	*Sames*	*Sames 501*	*1.4 mm*		*60 kV*	*N/A*	*10-12"*	
Clearcoat Exterior	*Fanuc*	*Versa Bell II*	*1.2 mm*	*Serrated Bell*	*80 kV*	*45,000*	*10"*	

Line Speed: 17.1 ft/min

Process Diagram



Paint Metering Data Record

Ford FRAP Transfer Efficiency Test, October 2016

Dark Gray Prime

Process	Applicator	Vehicle ID/ Paint Sprayed (cc) 5116	5126	5092
Prime	P1	192	192	192
	P2	195	195	195
	P3	137	137	137
	P4	137	137	137
	Prime (cc):	661	661	661
	Prime (gal):	0.175	0.175	0.175

Total Paint Sprayed (gal): **0.524**

Paint Metering Data Record

Ford FRAP Transfer Efficiency Test, October 2016

Absolute Black Basecoat

Process	Applicator	Vehicle ID/ Paint Sprayed (cc) 5116	5126	5092
Interior Basecoat	P2A	318	318	319
	P2B	194	193	193
	P3	365	367	365
	P4	401	403	403
Exterior Basecoat	P1	292	292	292
	P2	281	281	281
	P3	108	109	109
Total (cc):		1959	1963	1962
Total (gal):		0.518	0.519	0.518

Total Paint Sprayed (gal): **1.555**

Paint Metering Data Record
Ford FRAP Transfer Efficiency Test, October 2016

Clearcoat

Process	Applicator	Vehicle ID/ Paint Sprayed (cc) 5116	5126	5092
Clearcoat Interior	P1	107	107	107
	P2	107	107	107
	P3	116	116	116
	P4	116	116	116
	Total (cc):	446	446	446
	Total (gal):	0.118	0.118	0.118

Total Interior Clearcoat Sprayed (gal): **0.353**

Process	Applicator	Vehicle ID/ Paint Sprayed (cc) 5116	5126	5092
Clearcoat Exterior	R1	248	248	248
	R2	254	254	254
	R3	243	242	242
	R4	249	249	249
	R5	309	309	309
	R6	--	--	--
	R7	122	122	123
	R8	309	309	309
	Total (cc):	1734	1733	1734
	Total (gal):	0.458	0.458	0.458

Total Exterior Clearcoat Sprayed (gal): **1.374**

Paint Metering Data Record
Ford FRAP Transfer Efficiency Test, October 2016

Mid Gray Prime

Process	Applicator	Vehicle ID/ Paint Sprayed (cc) 4367	4292	4246
Prime	P1	192	192	192
	P2	195	195	195
	P3	137	137	137
	P4	137	137	137
	Prime (cc):	661	661	661
	Prime (gal):	0.175	0.175	0.175

Total Paint Sprayed (gal): **0.524**

Paint Metering Data Record
Ford FRAP Transfer Efficiency Test, October 2016

Burgandy Basecoat

Process	Applicator	Vehicle ID/ Paint Sprayed (cc) 4367	4292	4246
Interior Basecoat	P2A	218	218	218
	P2B	199	201	199
	P3	269	268	269
	P4	299	299	299
Exterior Basecoat	P1	269	269	269
	P2	259	259	259
	P3	109	109	109
Total (cc):		1622	1623	1622
Total (gal):		0.429	0.429	0.429

Total Paint Sprayed (gal): **1.286**

Paint Metering Data Record
Ford FRAP Transfer Efficiency Test, October 2016

Tinted Clearcoat

Process	Applicator	Vehicle ID/ Paint Sprayed (cc) 4367	4292	4246
Clearcoat Interior	P1	107	107	107
	P2	107	107	107
	P3	116	116	116
	P4	116	116	116
	Total (cc):	446	446	446
	Total (gal):	0.118	0.118	0.118

Total Interior Clearcoat Sprayed (gal): **0.353**

Process	Applicator	Vehicle ID/ Paint Sprayed (cc) 4367	4292	4246
Clearcoat Exterior	R1	248	248	247
	R2	254	254	252
	R3	242	242	243
	R4	249	250	249
	R5	309	309	309
	R6	--	--	--
	R7	123	123	122
	R8	305	305	305
	Total (cc):	1730	1731	1727
	Total (gal):	0.457	0.457	0.456

Total Exterior Clearcoat Sprayed (gal): **1.371**

10/12/16 8:AM START

TE Testung D544 - UX (Ingot Silver)
Flat Rock Fluid Delivery ESB#1

		Set Point (Prod. Flowrate)	Actual (measured)
Prime	R1	150	155
	R2	150	150
	R3	150	150
	R4	150	150

		Set Point (Prod. Flowrate)	Actual (measured)
Z2 P500	R1	60	60
	R2	60	75 – 60
	R3	60	50 – 60
	R4	60	80 – paint pump change/N. (over)

paint pump change 10/13 OK 60cc

		Set Point (Prod. Flowrate)	Actual (measured)
P700 Interior	P1	350	Bell speed.
	P2	350	350
	P3	350	350
	P4	350	350

		Set Point (Prod. Flowrate)	Actual (measured)
Clear P200	R1	400	400
	R2	400	400
	R3	400	400
	R4	400	400

Brake mod ? 10/14/1

		Set Point (Prod. Flowrate)	Actual (measured)
Z1 P500	R1	200	200
	R2	200	200
	R3	200	200
	R4	200	200

		Set Point (Prod. Flowrate)	Actual (measured)
Clear P500	R1	200	200
	R2	200	200
	R3	200	200
	R4	200	200
	R1	200	200
	R2	200	200
	R3	200	200
	R4	200	200

Vehicle Weigh Station Data Record
3-Wet: Prime, Black Basecoat and Clearcoat
Ford FRAP Transfer Efficiency Test, October 2016

Test Vehicle 1		**Ecoat Weight (lb.)** *W1*	**Coated Weight** *W2*
Carrier	5116	1149.28	1152.54
VIN	TE 6	1149.28	1152.52
		1149.28	1152.54
Two-Pound Linearity Check:		*1151.28*	*1154.54*
Average Vehicle Weight:		1149.28	1152.53
Vehicle Weight Gain:			**3.25**

Test Vehicle 2		**Ecoat Weight (lb.)** *W1*	**Coated Weight** *W2*
Carrier	5126	1138.50	1141.72
VIN	TE 7	1138.52	1141.70
		1138.56	1141.72
Two-Pound Linearity Check:		*1140.54*	*1143.72*
Average Vehicle Weight:		1138.53	1141.71
Vehicle Weight Gain:			**3.19**

Test Vehicle 3		**Ecoat Weight (lb.)** *W1*	**Coated Weight** *W2*
Carrier	5092	1137.46	1140.74
VIN	TE 8	1137.52	1140.74
		1137.52	1140.74
Two-Pound Linearity Check:		*1139.52*	*1142.74*
Average Vehicle Weight:		1137.50	1140.74
Vehicle Weight Gain:			**3.24**

Control Vehicle		**Ecoat Weight (lb.)** *W1*	**Coated Weight (lb.)** *W2*
Carrier	5107	1148.86	1147.70
VIN	TE 5	1148.86	1147.70
		1148.88	1147.70
Two-Pound Linearity Check:		*1150.88*	*1149.70*
Average Vehicle Weight:		1148.87	1147.70
Vehicle Weight Gain:			**-1.17**

Vehicle Weigh Station Data Record
3-Wet: Prime, Burgandy Basecoat and Clearcoat
Ford FRAP Transfer Efficiency Test, October 2016

Test Vehicle 1		**Ecoat Weight (lb.)** *W1*	**Coated Weight** *W2*
Carrier	4367	1145.58	1149.38
VIN	TE 2	1145.58	1149.36
		1145.50	1149.38
Two-Pound Linearity Check:		*1147.50*	*1151.38*
Average Vehicle Weight:		1145.55	1149.37
Vehicle Weight Gain:			**3.82**

Test Vehicle 2		**Ecoat Weight (lb.)** *W1*	**Coated Weight** *W2*
Carrier	4292	1146.32	1149.60
VIN	TE 3	1146.38	1149.64
		1146.34	1149.62
Two-Pound Linearity Check:		*1148.34*	*1151.62*
Average Vehicle Weight:		1146.35	1149.62
Vehicle Weight Gain:			**3.27**

Test Vehicle 3		**Ecoat Weight (lb.)** *W1*	**Coated Weight** *W2*
Carrier	4246	1144.54	1148.26
VIN	TE 4	1144.48	1148.28
		1144.50	1148.16
Two-Pound Linearity Check:		*1146.50*	*1150.20*
Average Vehicle Weight:		1144.51	1148.23
Vehicle Weight Gain:			**3.73**

Control Vehicle		**Ecoat Weight (lb.)** *W1*	**Coated Weight (lb.)** *W2*
Carrier	4309	1145.88	1145.84
VIN	TE 1	1145.90	1145.84
		1145.88	1145.86
Two-Pound Linearity Check:		*1147.88*	*1147.86*
Average Vehicle Weight:		1145.89	1145.85
Vehicle Weight Gain:			**-0.04**

AToM

ADVANCED TECHNOLOGIES of MICHIGAN
Jeffries Tech Center
37651 Schoolcraft Road
Livonia, MI 48150
Phone: (734) 953-5034 Fax: (734) 953-5415
Email: atominc@sbcglobal.net

Ford Flat Rock Assembly Plant

Requestor:			JLB Industries, LLC			Date:		10/28//2016	
Sample Name	%NV	%V	Density	Density	% water	VOC		VOC - Water	
			g/mL	#/gal		g/L	#/gal	g/(L-Vol_w)	#/(gal-Vol_w)
DK Grey Primer 6578 10/26/2016	58.10	41.90	1.105	9.22	0	463.0	3.86		
LG Grey Primer 10/27/2016	60.41	39.59	1.137	9.49	0	450.1	3.76		
Absolute Black BC 10/26/2016	43.77	56.23	0.938	7.83	0	527.7	4.40		
Burgandy Velvet BC 10/27/2016	38.87	61.13	0.949	7.92	0	579.9	4.84		
Clearcoat 9000 10/26/2016	55.38	44.62	1.025	8.56	0	457.5	3.82		
Interior Clearcoat 10/27/2016	51.96	48.04	1.00	8.35	0	480.5	4.01		
Tinted Exterior Clearcoat 10/27/2016	52.22	47.78	1.010	8.38	0	482.8	4.03		

Certificate of Analysis

PPG INDUSTRIES
3800 West 143rd Street
Cleveland, OH 44111

Submitted to: Ford Motor Company

Supplier: (Manufacturing Site)	PPG Industries, Inc.	**Date:**	07/31/16
Material Name:	Dark Grey Primer	**M Number:**	M6578
Approved By:	Chris Massie	**Supplier Batch #:**	98709
Color Standard Date:	N/A	**Basecoat Supplier Code:**	LP6578R
% Reduction (Target)	N/A	**Tox #:**	195648
Reducing Solvent	N/A	**Batch Size:**	1500 GAL

Test Description	Test Method	Range			Actual
WPG (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	9.354
% NV by Wt (Pkg theoretical)	TM-CALC	REPORT	-	REPORT	59.47%
Vol %NV (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	47.16%
VOC (PkgTheoretical)	TM-CALC	REPORT	-	REPORT	3.791

Test Description	Test Method	Range			Actual
Ford Viscosity (Pkg)	ASTM D 1200/ASTM D4287	30	-	34.00	31.8
% NV by Wt (Pkg)	ASTM D 1353	57	-	67.00	57.87
VOC (Pkg)	ASTM D 3960	3.5	-	4.20	3.76
LB HAPS PER GALLON	TM-CALC	REPORT	-	REPORT	0.20
% wt HAPS	TM-CALC	REPORT	-	REPORT	2.13
Resistivity	ASTM D5682	0.05	-	2.00	0.71
Adhesion	FLTM BI 106-01 Part B	0	-	2.00	0
Intercoat Adhesion (Std/Std)	FLTM BI 106-01 Part B	PASS	-	PASS	PASS
Crater Count[2]		0	-	1.00	0
Dirt Count	PARTICLES	0	-	5.00	3
	FIBERS	0	-	3.00	0
WPG (Pkg)	ASTM D 1475	REPORT	-	REPORT	9.35
Color		0	-	1.00	0.44

[1] Pop & Sag Clearcoat & Primer only testing
[2] Clearcoat, Waterborne Basecoat, & Primer only testing.
[4] Clearcoat Wet Sample Transmittance.
[5] Non-suspected carcinogenic HAPs @ 1% or greater by weight.
[6] Suspected Carcinogenic Based HAPs @ 0.1% or greater based upon weight
[8] X-Rite Color Readings will be required here for consistency & Color Harmony
[7] Wavescan test results have been compared to historical statistical data, per a Ford/PPG agreement

Certificate of Analysis

PPG INDUSTRIES
3800 West 143rd Street
Cleveland, OH 44111

Submitted to: Ford Motor Company

Supplier: (Manufacturing Site)	PPG Industries, Inc.	**Date:**	10/05/16
Material Name:	Absolute Black	**M Number:**	M7343
Approved By:	Mo McGunagle	**Supplier Batch #:**	11528
Color Standard Date:	N/A	**Basecoat Supplier Code:**	DCT7343RL
% Reduction (Target)	N/A	**Tox #:**	193663
Reducing Solvent	N/A	**Batch Size:**	4000 GAL

Test Description	Test Method	Range			Actual
WPG (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	7.858
% NV by Wt (Pkg theoretical)	TM-CALC	REPORT	-	REPORT	48.97%
Vol %NV (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	40.79%
VOC (PkgTheoretical)	TM-CALC	REPORT	-	REPORT	4.01

Ford

Test Description	Test Method	Range			Actual
Ford Viscosity (Pkg)	ASTM D 1200/ASTM D4287	16	-	18.00	18
WPG (Pkg)	ASTM D 1475	REPORT	-	REPORT	7.86
% NV by Wt (Pkg)	ASTM D 1353	42	-	50.00	44.17
VOC (Pkg)	ASTM D 3960	4	-	4.50	4.39
LB HAPS PER GALLON	TM-CALC	REPORT	-	REPORT	0.00
% wt HAPS	TM-CALC	REPORT	-	REPORT	0.00
Resistivity	ASTM D5682	0.05	-	2.00	0.14
Color Ecmc 15°	SAE J1545°	0	-	3.00	1.08
Color Ecmc 25°	SAE J1545°	0	-	3.00	0.21
Color Ecmc 45°	SAE J1545°	0	-	3.00	0.12
Color Ecmc 75°	SAE J1545°	0	-	3.00	0.05
Color Ecmc 110°	SAE J1545°	0	-	3.00	0.21
QMS7 (Wavescan) Horizontal	SDS DVM 0030-PA	MINIMUM	-	55.00	72.7
Vertical		MINIMUM	-	42.00	71.7
DRY HIDING		0.4	-	0.70	0.4
Adhesion	FLTM BI 106-01 Part B	0	-	2.00	0
Intercoat Adhesion (Std/Std)	FLTM BI 106-01 Part B	PASS	-	PASS	PASS
Dirt Count	PARTICLES	0	-	5.00	1
	FIBERS	0	-	3.00	0

[1] Pop & Sag Clearcoat & Primer only testing
[2] Clearcoat, Waterborne Basecoat, & Primer only testing.
[4] Clearcoat Wet Sample Transmittance.
[5] Non-suspected carcinogenic HAPs @ 1% or greater by weight.
[6] Suspected Carcinogenic Based HAPs @ 0.1% or greater based upon weigh
[8] X-Rite Color Readings will be required here for consistency & Color Harmony
[7] Wavescan test results have been compared to historical statistical data, per a Ford/PPG agreement

Certificate of Analysis

PPG INDUSTRIES
3800 West 143rd Street
Cleveland, OH 44111

Submitted to: Ford Motor Company

Supplier: (Manufacturing Site)	PPG Industries, Inc.	**Date:**	10/23/16
Material Name:	Carbamate Clear for 3-Wet	**M Number:**	M9000
Approved By:	Kathy Immonen	**Supplier Batch #:**	12104
Color Standard Date:	N/A	**Basecoat Supplier Code:**	TMAC9000FR
% Reduction (Target)	N/A	**Tox #:**	191186
Reducing Solvent	N/A	**Batch Size:**	6500 GAL

Test Description	Test Method	Range			Actual
WPG (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	8.617
% NV by Wt (Pkg theoretical)	TM-CALC	REPORT	-	REPORT	59.72%
Vol %NV (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	53.20%
VOC (PkgTheoretical)	TM-CALC	REPORT	-	REPORT	3.47

Test Description	Test Method	Range			Actual
Ford Viscosity (Pkg)	ASTM D 1200/ASTM D4287	27	-	30.00	29.3
WPG (Pkg)	ASTM D 1475	REPORT	-	REPORT	8.62
% NV by Wt (Pkg)	ASTM D 1353	54.5	-	58.00	55.96
VOC (Pkg)	ASTM D 3960	3.3	-	4.10	3.8
LB HAPS PER GALLON	TM-CALC	REPORT	-	REPORT	0.00
% wt HAPS	TM-CALC	REPORT	-	REPORT	0.00
Resistivity	ASTM D5682	0.05	-	2.00	0.14
UV Transmittance @ 360 NM	ASTM E 169-99	REPORT	-	REPORT	26.79
QMS7 (Wavescan) Horizontal	SDS DVM 0030-PA	MINIMUM	-	55.00	68.2
Vertical		MINIMUM	-	42.00	69.9
Pop	POPSPRY000	1.8	-	2.50	2.5
Sag	FLTM BL 122-02	1.6	-	2.20	2.2
Adhesion	FLTM BI 106-01 Part B	0	-	2.00	0
Crater Count[2]		0	-	1.00	0
Dirt Count	PARTICLES	0	-	5.00	0
	FIBERS	0	-	3.00	0

[1] Pop & Sag Clearcoat & Primer only testing
[2] Clearcoat, Waterborne Basecoat, & Primer only testing.
[4] Clearcoat Wet Sample Transmittance.
[7] Wavescan test results have been compared to historical statistical data, per a Ford/PPG agreement
[5] Non-suspected carcinogenic HAPs @ 1% or greater by weight.
[6] Suspected Carcinogenic Based HAPs @ 0.1% or greater based upon weigh
[8] X-Rite Color Readings will be required here for consistency & Color Harmony

Certificate of Analysis

PPG INDUSTRIES
3800 West 143rd Street
Cleveland, OH 44111

Submitted to: Ford Motor Company

Supplier: (Manufacturing Site)	PPG Industries, Inc.	**Date:**	10/11/16
Material Name:	Carbamate Clear for 3-Wet	**M Number:**	M2000
Approved By:	Angela Smith	**Supplier Batch #:**	11584
Color Standard Date:	N/A	**Basecoat Supplier Code:**	INTCC2000R
% Reduction (Target)	N/A	**Tox #:**	196846
Reducing Solvent	N/A	**Batch Size:**	500 GAL

Test Description	Test Method	Range			Actual
WPG (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	8.424
% NV by Wt (Pkg theoretical)	TM-CALC	REPORT	-	REPORT	56.95%
Vol %NV (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	50.01%
VOC (PkgTheoretical)	TM-CALC	REPORT	-	REPORT	3.627

Test Description	Test Method	Range			Actual
Ford Viscosity (Pkg)	ASTM D 1200/ASTM D4287	22	-	24.00	23.9
WPG (Pkg)	ASTM D 1475	REPORT	-	REPORT	8.42
% NV by Wt (Pkg)	ASTM D 1353	52	-	55.00	53.88
VOC (Pkg)	ASTM D 3960	3.4	-	4.20	3.88
LB HAPS PER GALLON	TM-CALC	REPORT	-	REPORT	0.01
% wt HAPS	TM-CALC	REPORT	-	REPORT	0.10
Resistivity	ASTM D5682	0.05	-	2.00	0.09
UV Transmittance @ 360 NM	ASTM E 169-99	REPORT	-	REPORT	26.55
QMS7 (Wavescan) Horizontal	SDS DVM 0030-PA	MINIMUM	-	55.00	71.8
Vertical		MINIMUM	-	42.00	69.3
Pop	POPSPRY000	1.8	-	2.50	2.5
Sag	FLTM BL 122-02	1	-	2.15	1.44
Adhesion	FLTM BI 106-01 Part B	0	-	2.00	0
Crater Count[2]		0	-	1.00	0
Dirt Count	PARTICLES	0	-	5.00	2
	FIBERS	0	-	3.00	1

[1] Pop & Sag Clearcoat & Primer only testing
[2] Clearcoat, Waterborne Basecoat, & Primer only testing.
[4] Clearcoat Wet Sample Transmittance.
[5] Non-suspected carcinogenic HAPs @ 1% or greater by weight.
[6] Suspected Carcinogenic Based HAPs @ 0.1% or greater based upon weigh
[8] X-Rite Color Readings will be required here for consistency & Color Harmony
[7] Wavescan test results have been compared to historical statistical data, per a Ford/PPG agreement

Certificate of Analysis

PPG INDUSTRIES
3800 West 143rd Street
Cleveland, OH 44111

Submitted to: Ford Motor Company

Supplier: (Manufacturing Site)	PPG Industries, Inc.	**Date:**	10/08/16
Material Name:	Mid Grey Primer	**M Number:**	M6534
Approved By:	Anna Major	**Supplier Batch #:**	11288
Color Standard Date:	N/A	**Basecoat Supplier Code:**	LP6534R
% Reduction (Target)	N/A	**Tox #:**	194897
Reducing Solvent	N/A	**Batch Size:**	7202 GAL

Test Description	Test Method	Range			Actual
WPG (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	9.462
% NV by Wt (Pkg theoretical)	TM-CALC	REPORT	-	REPORT	61.97%
Vol %NV (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	49.71%
VOC (PkgTheoretical)	TM-CALC	REPORT	-	REPORT	3.598

Test Description	Test Method	Range			Actual
Ford Viscosity (Pkg)	ASTM D 1200/ASTM D4287	30	-	34.00	34
% NV by Wt (Pkg)	ASTM D 1353	57	-	67.00	60.27
VOC (Pkg)	ASTM D 3960	3.4	-	4.20	3.76
LB HAPS PER GALLON	TM-CALC	REPORT	-	REPORT	0.23
% wt HAPS	TM-CALC	REPORT	-	REPORT	2.43
Resistivity	ASTM D5682	0.05	-	2.00	0.62
Adhesion	FLTM BI 106-01 Part B	0	-	2.00	0
Intercoat Adhesion (Std/Std)	FLTM BI 106-01 Part B	PASS	-	PASS	PASS
Crater Count[2]		0	-	1.00	0
Dirt Count	PARTICLES	0	-	5.00	0
	FIBERS	0	-	3.00	0
WPG (Pkg)	ASTM D 1475	REPORT	-	REPORT	9.46
Color		0	-	1.00	0.18

[1] Pop & Sag Clearcoat & Primer only testing
[2] Clearcoat, Waterborne Basecoat, & Primer only testing.
[4] Clearcoat Wet Sample Transmittance.
[7] Wavescan test results have been compared to historical statistical data, per a Ford/PPG agreement
[5] Non-suspected carcinogenic HAPs @ 1% or greater by weight.
[6] Suspected Carcinogenic Based HAPs @ 0.1% or greater based upon weigh
[8] X-Rite Color Readings will be required here for consistency & Color Harmony

Certificate of Analysis

PPG INDUSTRIES
3800 West 143rd Street
Cleveland, OH 44111

Submitted to: Ford Motor Company

Supplier: (Manufacturing Site)	PPG Industries, Inc.	**Date:**	08/28/16
Material Name:	Burgandy Velvet	**M Number:**	M7356
Approved By:	Jennifer Medvin	**Supplier Batch #:**	99818
Color Standard Date:	N/A	**Basecoat Supplier Code:**	DCT7356RL
% Reduction (Target)	N/A	**Tox #:**	193773
Reducing Solvent	N/A	**Batch Size:**	500 GAL

Test Description	Test Method	Range			Actual
WPG (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	7.988
% NV by Wt (Pkg theoretical)	TM-CALC	REPORT	-	REPORT	43.76%
Vol %NV (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	34.35%
VOC (PkgTheoretical)	TM-CALC	REPORT	-	REPORT	4.492

Test Description	Test Method	Range			Actual
Ford Viscosity (Pkg)	ASTM D 1200/ASTM D4287	17	-	19.00	17.6
WPG (Pkg)	ASTM D 1475	REPORT	-	REPORT	7.99
% NV by Wt (Pkg)	ASTM D 1353	40	-	48.00	41.99
VOC (Pkg)	ASTM D 3960	4.4	-	4.80	4.64
LB HAPS PER GALLON	TM-CALC	REPORT	-	REPORT	0.00
% wt HAPS	TM-CALC	REPORT	-	REPORT	0.00
Resistivity	ASTM D5682	0.05	-	2.00	0.11
Color Ecmc 15°	SAE J1545°	0	-	3.00	1.33
Color Ecmc 25°	SAE J1545°	0	-	3.00	0.54
Color Ecmc 45°	SAE J1545°	0	-	3.00	0.26
Color Ecmc 75°	SAE J1545°	0	-	3.00	0.63
Color Ecmc 110°	SAE J1545°	0	-	3.00	0.44
QMS7 (Wavescan) Horizontal	SDS DVM 0030-PA	MINIMUM	-	60.00	71.3
Vertical		MINIMUM	-	47.00	65.9
DRY HIDING		0.4	-	0.80	0.4
Adhesion	FLTM BI 106-01 Part B	0	-	2.00	0
Intercoat Adhesion (Std/Std)	FLTM BI 106-01 Part B	PASS	-	PASS	PASS
Crater Count[2]		0	-	1.00	0
Dirt Count	PARTICLES	0	-	5.00	0
	FIBERS	0	-	3.00	0

[1] Pop & Sag Clearcoat & Primer only testing
[2] Clearcoat, Waterborne Basecoat, & Primer only testing.
[4] Clearcoat Wet Sample Transmittance.
[5] Non-suspected carcinogenic HAPs @ 1% or greater by weight.
[6] Suspected Carcinogenic Based HAPs @ 0.1% or greater based upon weigh
[8] X-Rite Color Readings will be required here for consistency & Color Harmony
[7] Wavescan test results have been compared to historical statistical data, per a Ford/PPG agreement

Certificate of Analysis

PPG INDUSTRIES
3800 West 143rd Street
Cleveland, OH 44111

Submitted to: Ford Motor Company

Supplier: (Manufacturing Site)	PPG Industries, Inc.	**Date:**	07/17/16
Material Name:	Burgandy Velvet Tinted CC	**M Number:**	M7356
Approved By:	Jesse Lubinski	**Supplier Batch #:**	98210
Color Standard Date:	N/A	**Basecoat Supplier Code:**	TMAC7356R
% Reduction (Target)	N/A	**Tox #:**	193813
Reducing Solvent	N/A	**Batch Size:**	800 GAL

Test Description	Test Method	Range			Actual
WPG (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	8.617
% NV by Wt (Pkg theoretical)	TM-CALC	REPORT	-	REPORT	59.81%
Vol %NV (Pkg Theoretical)	TM-CALC	REPORT	-	REPORT	53.36%
VOC (PkgTheoretical)	TM-CALC	REPORT	-	REPORT	3.463

Test Description	Test Method	Range			Actual
Ford Viscosity (Pkg)	ASTM D 1200/ASTM D4287	27	-	29.00	29
WPG (Pkg)	ASTM D 1475	REPORT	-	REPORT	8.62
% NV by Wt (Pkg)	ASTM D 1353	53	-	60.00	55.71
VOC (Pkg)	ASTM D 3960	3.3	-	4.10	3.83
LB HAPS PER GALLON	TM-CALC	REPORT	-	REPORT	0.00
% wt HAPS	TM-CALC	REPORT	-	REPORT	0.00
Resistivity	ASTM D5682	0.05	-	2.00	0.11
UV Transmittance @ 360 NM	ASTM E 169-99	REPORT	-	REPORT	28.59
QMS7 (Wavescan) Horizontal	SDS DVM 0030-PA	MINIMUM	-	55.00	68.6
Vertical		MINIMUM	-	42.00	61
Pop	POPSPRY000	1.8	-	2.50	1.8
Sag	FLTM BL 122-02	1.6	-	2.20	1.83
Adhesion	FLTM BI 106-01 Part B	0	-	2.00	0
Crater Count[2]		0	-	1.00	0
Dirt Count	PARTICLES	0	-	5.00	0
	FIBERS	0	-	3.00	0

[1] Pop & Sag Clearcoat & Primer only testing
[2] Clearcoat, Waterborne Basecoat, & Primer only testing.
[4] Clearcoat Wet Sample Transmittance.
[5] Non-suspected carcinogenic HAPs @ 1% or greater by weight.
[6] Suspected Carcinogenic Based HAPs @ 0.1% or greater based upon weigh
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JLB Industries, LLC

Chain of Custody Form

Facility: FORD FLAT ROCK ASSEMBLY PLANT

Material Name	Sampling Location	Date/Time	Label	Comment	Preservative
DARK GRAY PRIME	MIX ROOM	10/26/16	DK GRAY PRIME	Solvent	NONE
MID GRAY PRIME	"	10/27/16	LG PRIME	"	"
ABSOLUTE BLACK BC	"	10/26/16	ABSOLUTE BLK	"	"
BURGUNDY VELVET BC	"	10/27/16	BURGUNDY VELVET BC	"	"
CLEARCOAT	"	10/26/16	CC 9000	"	"
INTERIOR CLEARCOAT	"	10/27/16	INT CC	"	"
TINTED CLEARCOAT	"	10/27/16	EXT CC	"	"

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	10/28/16	12:20p	ATOM	10/28/16	12:20p