

**Test Method D5967**

**Mack T-8**

**Version**

**Method:**

**Conducted For**

<b>T-8A:</b>	<b>V = Valid</b>	<b>The Reference Oil/Non-Reference Oil was evaluated in accordance with the test procedure.</b>
<b>T-8:</b>	<b>I = Invalid</b>	<b>The Reference Oil/Non-Reference was not evaluated in accordance with the test procedure</b>
<b>T-8E:</b>	<b>N = Not Interpretable</b>	<b>The Non-Reference Oil results cannot be interpreted and shall not be used in determining an average test result using multiple test criteria.</b>

<b>Stand:</b>	<b>Stand Run No.:</b>	<b>Engine No.:</b>	<b>Engine Hours:</b>
<b>End Of Test Date:</b>		<b>End Of Test Time:</b>	
<b>Oil Code/CMIR: <sup>A</sup></b>			
<b>T-8 Formulation/Stand Code:</b>			
<b>T-8E Formulation/Stand Code:</b>			
<b>Alternate Codes:</b>			

<sup>A</sup> CMIR or Non-Reference Oil Code

**Submitted By:**

\_\_\_\_\_ **Testing Laboratory**

\_\_\_\_\_ **Signature**

\_\_\_\_\_ **Typed Name**

\_\_\_\_\_ **Title**

**Test Method D5967 – Mack T-8  
Form 1  
Test Result Summary**

<b>T-8 Formulation/Stand Code:</b>						<b>Test Length: <sup>A</sup></b>				
<b>T -8E Formulation/Stand Code:</b>										
<b>Reference Oil Test</b>						<b>Non-Reference Oil Test</b>				
<b>CMIR No.:</b>						<b>Oil Code:</b>				
<b>TMC Oil No.</b>	<b>Test Lab</b>	<b>Test Stand No.</b>	<b>Test Stand Run No.</b>	<b>Engine Block Serial No.</b>	<b>Rebuild Block Hours</b>	<b>Test Lab</b>	<b>Test Stand No.</b>	<b>Test Stand Run No.</b>	<b>Engine Block Serial NO.</b>	<b>Engine Block Hours</b>
<b>Date Test Started:</b>		<b>Date Test Completed:</b>		<b>EOT Time:</b>		<b>Date Test Started:</b>		<b>Date Test Completed:</b>		<b>EOT Time:</b>
<b>Laboratory Oil Code:</b>						<b>Laboratory Oil Code:</b>				
<b>SAE Viscosity:</b>						<b>SAE Viscosity:</b>				

<b>Viscosity Slope 100 - 150 h, cSt/h</b>		<b>Viscosity Slope 100 - 150 h, cSt/h</b>	
<b>Viscosity Increase At 3.8% TGA, cSt</b>		<b>Viscosity Increase At 3.8% TGA, cSt</b>	
<b>Correction Factor, Vis. Inc. at 3.8% TGA</b>		<b>Correction Factor, Vis. Inc. at 3.8% TGA</b>	
		<b>Severity Adjustment For Viscosity Inc. At 3.8% TGA, cSt</b>	
<b>Final Viscosity Increase At 3.8% TGA, cSt</b>		<b>Final Viscosity Increase At 3.8% TGA, cSt</b>	
<b>Relative Viscosity At 4.8%, TGA (50% Loss)<sup>B</sup></b>		<b>Relative Viscosity At 4.8%, TGA (50% Loss)<sup>B</sup></b>	
<b>Correction Factor, Relative Vis. (50% Loss)</b>		<b>Correction Factor, Relative Vis. (50% Loss)</b>	
		<b>Severity Adjustment For Relative Viscosity</b>	
<b>Final Relative Viscosity (50% Loss)</b>		<b>Final Relative Viscosity (50% Loss)</b>	
<b>Relative Viscosity At 4.8%, TGA (100% Loss)<sup>B</sup></b>		<b>Relative Viscosity At 4.8%, TGA (100% Loss)<sup>B</sup></b>	
<b>Correction Factor, Relative Vis. (100% Loss)</b>		<b>Correction Factor, Relative Vis. (100% Loss)</b>	
		<b>Severity Adjustment For Relative Viscosity</b>	
<b>Final Relative Viscosity (100% Loss)</b>		<b>Final Relative Viscosity (100% Loss)</b>	
<b>TGA Soot % At 250 h</b>		<b>TGA Soot % At 250 h</b>	
<b>TGA Soot % At 300 h</b>		<b>TGA Soot % At 300 h</b>	
<b>Average Oil Consumption At 250 h (g/kW-h)</b>		<b>Average Oil Consumption At 250 h (g/kW-h)</b>	
<b>Oil Filter Delta At 250 h, kPa</b>		<b>Oil Filter Delta At 250 h, kPa</b>	

<sup>A</sup> Test length is discussed in sections 1.2, 4.1 A8.3.1 and A9.3.1

<sup>B</sup> Relative viscosities are calculated using shear loss determined by D6278

**TEST METHOD D5967  
FORM 2  
OPERATIONAL SUMMARY <sup>A</sup>**

Laboratory	Start Date
Test Number <sup>B</sup>	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

TEST PARAMETER	SPECIFICATION	AVERAGE	STD. DEV.	MINIMUM	MAXIMUM
Engine Speed, r/min	1800 ± 5				
Torque, N-m	1369 – 1398				
Fuel Flow, kg/h	63.28 ± 0.63				
Humidity, g/kg	Report				
Blowby, L/min	Report				
TEMPERATURES	SPECIFICATION	AVERAGE	STD. DEV.	MINIMUM	MAXIMUM
Coolant Out, °C	85 ± 3				
Coolant In, °C	Report Only				
Oil, °C	100 - 107				
Fuel In, °C	40 ± 1				
Intake Air, °C	25 ± 3				
Intake Manifold, °C	43 ± 3				
Pre- Turb. (F), °C	602 - 632				
Pre-Turbo (R), °C	602 - 632				
TailPipe, °C	455 - 474				
PRESSURES	SPECIFICATION	AVERAGE	STD.DEV	MINIMUM	MAXIMUM
Oil Gallery, kPa	372 -441				
Crankcase, kPa	0.50 ±0.25				
Exhaust, kPa	3.1 ± 0.4				
Oil Filter Delta, kPa	138 Max.				
Inlet Air Res., kPa	2.5 ± 0.25				
Intake Manifold, kPa	186 - 199				
Compressor Discharge, kPa	Report				
Intercooler Delta, kPa	13.6 Maximum				

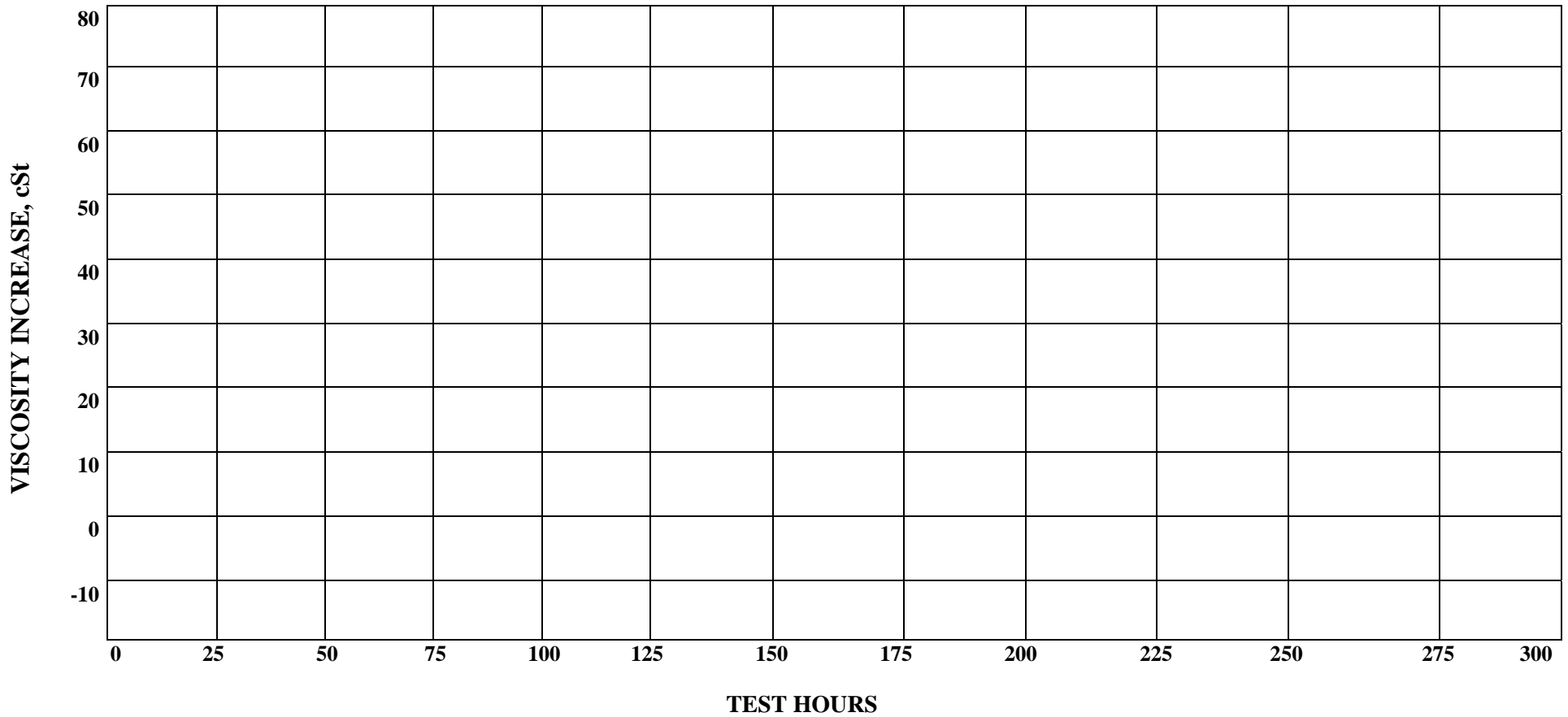
<sup>A</sup> ALL DATA VALUES SHOWN ARE BASED ON TEST LENGTH REPORTED ON FORM1

<sup>B</sup> TEST NUMBER IS: STAND – STAND RUN NO. – ENGINE SERIAL NO. – ENGINE HOURS

**TEST METHOD D5967  
FORM 3**

**VISCOSITY INCREASE VERSUS TIME**

Laboratory	Start Date
Test Number <sup>B</sup>	Oil Code
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code	





**TEST METHOD D5967  
FORM 5  
TEST FUEL ANALYSIS (LAST BATCH)**

Laboratory	Start Date
Test Number <sup>B</sup>	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	
Supplier:	Batch Identifiers:

Measurement	Specs.	Analysis		Test Method
		NEW	EOT	
Total Sulfur, % wt	0.03 - 0.05			D 129
Gravity, °API	32-36			D 287 or D 4052
<b>Hydrocarbon Composition</b>				
Aromatics % vol	28 - 35			D 1319
Olefin	Report			D 1319
Saturates	Report			D 1319
Cetane Index	Report			D 4737
Cetane No.	42 - 48			D 613
Copper Strip Corrosion	3 max			D 130
Flash Point, °C	54 min			D 93
Cloud Point °C	-12 max			D 2500
Pour Point °C	-18 max			D97
Carbon Residue on 10% Residium, %	0.35 max			D 524 (10 % Bottoms)
Water & Sediment, % Vol	0.05 max			D 2709
Ash, % wt	0.01 max			D482
Viscosity, cSt @ 40 °C	2.0 - 3.2			D445
<b>Distillation °C</b>				
IBP	177 - 199			D 86
10%	210 - 232			D 86
50%	249 - 277			D 86
90%	299 - 327			D 86
EP	327 - 360			D 86









**TEST METHOD D5967  
FORM 7  
CHARACTERISTICS OF THE DATA ACQUISITION SYSTEM**

Laboratory	Start Date
Test Number <sup>B</sup>	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

PARAMETER (1)	SENSING DEVICE (2)	CALIBRATION FREQUENCY (3)	RECORD DEVICE (4)	OBSERVATION FREQUENCY (5)	RECORD FREQUENCY (6)	LOG FREQUENCY (7)	SYSTEM RESPONSE (8)
<b>Temperatures</b>							
OIL@ FILT.							
FUEL IN.							
INTAKE AIR							
INTAKE MAN							
PRE- TURB.							
COOL. OUT							
<b>Other</b>							
FUEL FLOW							
ENGINE RPM							
LOAD							
INLET RESTR							
EXH. PRESS.							
OIL GAL PRES							

LEUEND:

- (1) OPERATING PARAMETER
- (2) THE TYPE OF DEVICE USED TO MEASURE TEMPERATURE, PRESSURE OR FLOW
- (3) FREQUENCY AT WHICH THE MEASUREMENT SYSTEM IS CALIBRATED
- (4) THE TYPE OF DEVICE WHERE DATA IS RECORDED  
 LG-HANDLOGSHEET  
 DL -AUTOMATIC DATA LOGGER  
 SC-STRIPCHARTRECORDER  
 C/M -COMPUTER, USING MANUAL DATA ENTRY  
 C/D -COMPUTER, USING DIRECT VO ENTRY
- (5) DATA ARE OBSERVED BUT ONLY IF RECORDED OFF SPEC.
- (6) DATA ARE RECORDED BUT ARE NOT RETAINED AT EOT
- (7) DATA ARE LOGGED AS PERMANENT RECORD, NOTE SPECIFY IF:  
 SS -SNAPSHOT TAKEN AT SPECIFIED FREQUENCY  
 AG/X AVERAGE OF X DATA POINTS AT SPECIFIED FREQUENCY
- (8) TIME FOR THE OUTPUT TO REACH 63.2% OF FINAL VALUE FOR STEP CHANGE AT INPUT

**TEST METHOD D5967  
FORM 8  
BUILD-UP AND HARDWARE INFORMATION**

Laboratory	Start Date
Test Number <sup>B</sup>	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

**TIMING**

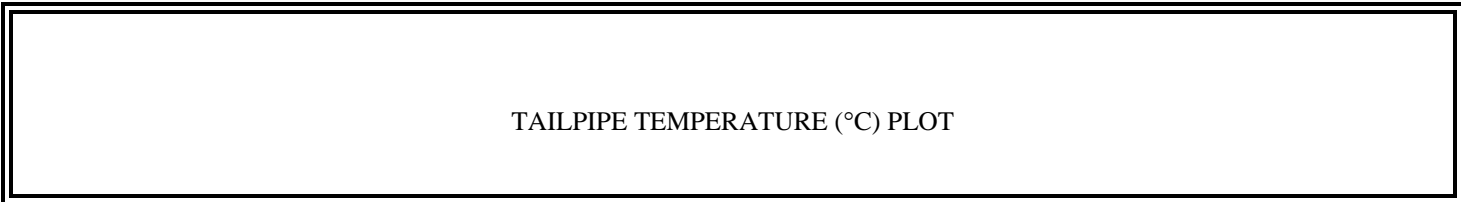
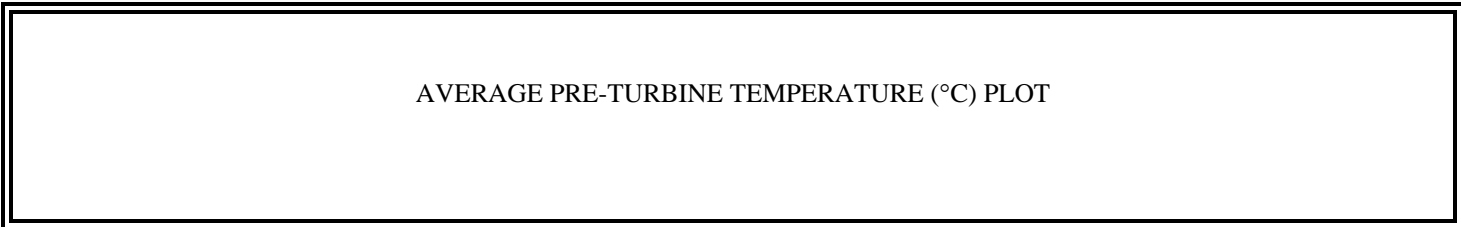
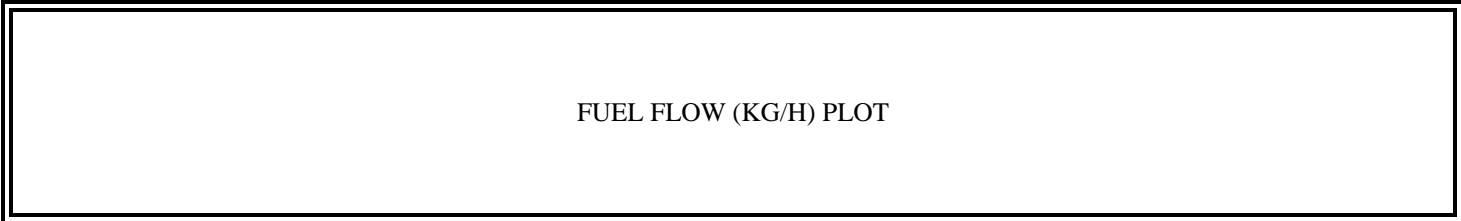
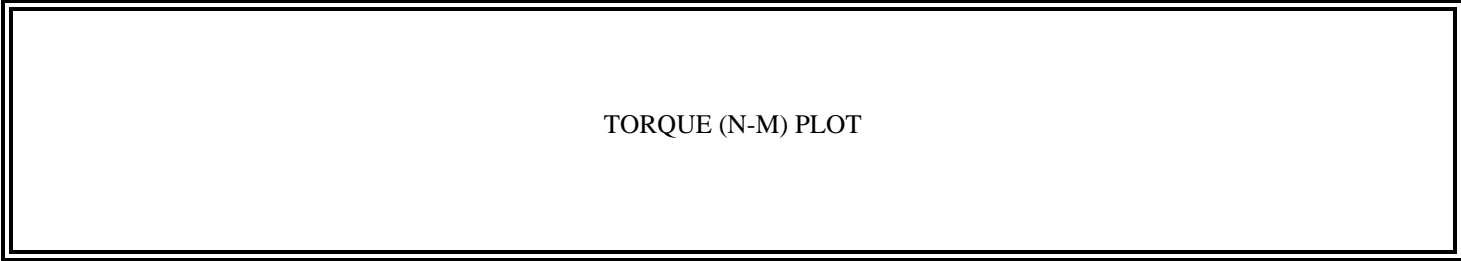
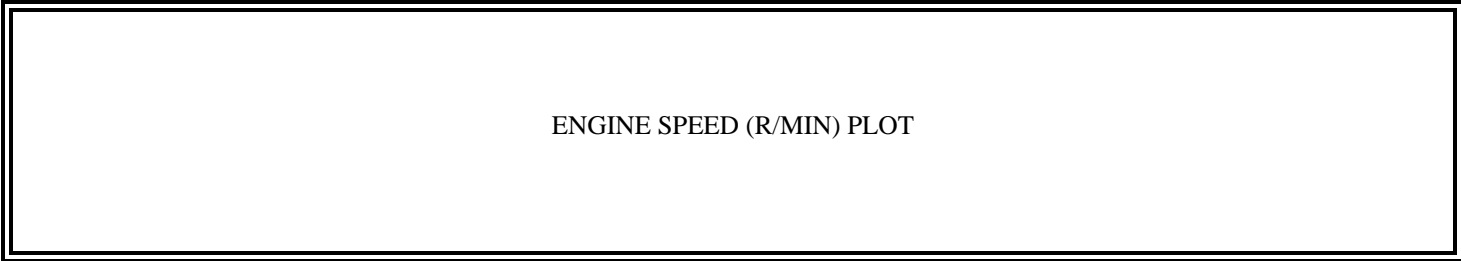
Lite/HPC Offset (deg)	
Piston Travel to TDC (deg)	
Timing (deg)	

**PARTS**

Part	Part Number	Serial Number
Injection Pump		
Turbo Charger		
Cylinder Head (front)		
Cylinder Head (rear)		
Pistons		
Injection Nozzles		

**TEST METHOD D5967  
FORM 9  
OPERATIONAL DATA**

Laboratory	Start Date
Test Number <sup>B</sup>	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	



**TEST METHOD D5967  
FORM 10  
OPERATIONAL DATA**

Laboratory	Start Date
Test Number <sup>B</sup>	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

COOLANT IN TEMPERATURE (°C) PLOT

COOLANT OUT TEMPERATURE (°C) PLOT

OIL TEMPERATURE (°C) PLOT

FUEL IN TEMPERATURE (°C) PLOT

**TEST METHOD D5967  
FORM 11  
OPERATIONAL DATA**

Laboratory	Start Date
Test Number <sup>B</sup>	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

INTAKE AIR TEMPERATURE (°C) PLOT
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INTAKE MANIFOLD TEMPERATURE (°C) PLOT
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OIL GALLERY PRESSURE (KPA) PLOT
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OIL FILTER PRESSURE (KPA) PLOT
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**TEST METHOD D5967  
FORM 12  
OPERATIONAL DATA**

Laboratory	Start Date
Test Number <sup>B</sup>	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

CRANKCASE PRESSURE (KPA) PLOT
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EXHAUST PRESSURE (KPA) PLOT
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INLET AIR RESTRICTION (KPA) PLOT
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INTAKE MANIFOLD PRESSURE (KPA) PLOT
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**TEST METHOD D5967**  
**Form 13**  
**American Chemistry Council Code of Practice**  
**Test Laboratory Conformance Statement**

Test Laboratory					
Test Sponsor					
T8E Formulation / Stand Code					
Test Number					
Start Date		Start Time		Time Zone	

**Declarations**

No. 1 All requirements of the ACC Code of Practice for which the test laboratory is responsible were met in the conduct of this test. Yes \_\_\_\_\_ No \_\_\_\_\_\*

No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other) including all updates issued by the organization responsible for the test, were met.  
 Yes \_\_\_\_\_ No \_\_\_\_\_\*

If the response to this Declaration is “No”, does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory?  
 Yes \_\_\_\_\_\* No \_\_\_\_\_

No. 3 A deviation occurred for one of the test parameters identified by the organization responsible for the test as being a special case. Yes \_\_\_\_\_\* No \_\_\_\_\_ (*This currently applies only to specific deviations identified in the ASTM Information Letter System*)

***Check The Appropriate Conclusion***

	Operational review of this test indicates that the results should be included in the Multiple Test Acceptance Criteria calculations.
	*Operational review of this test indicates that the results should not be included in the Multiple Test Acceptance Criteria calculations.

Note: *Supporting comments are required for all responses identified with an asterisk.*

Comments

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Typed Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title



**TEST METHOD D5967**  
**Form 13A**  
**American Chemistry Council Code of Practice**  
**Test Laboratory Conformance Statement**

Test Laboratory					
Test Sponsor					
T8 Formulation / Stand Code					
Test Number					
Start Date		Start Time		Time Zone	

**Declarations**

No. 1 All requirements of the ACC Code of Practice for which the test laboratory is responsible were met in the conduct of this test. Yes\_\_\_\_\_ No\_\_\_\_\_\*

No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other) including all updates issued by the organization responsible for the test, were met.  
 Yes\_\_\_\_\_ No\_\_\_\_\_\*

If the response to this Declaration is “No”, does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory?  
 Yes\_\_\_\_\_ \* No\_\_\_\_\_

No. 3 A deviation occurred for one of the test parameters identified by the organization responsible for the test as being a special case. Yes\_\_\_\_\_ \* No\_\_\_\_\_ (*This currently applies only to specific deviations identified in the ASTM Information Letter System*)

***Check The Appropriate Conclusion***

	Operational review of this test indicates that the results should be included in the Multiple Test Acceptance Criteria calculations.
	*Operational review of this test indicates that the results should not be included in the Multiple Test Acceptance Criteria calculations.

*Note: Supporting comments are required for all responses identified with an asterisk.*

Comments

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Typed Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title