

**D 6750**  
**1K/1N Final Report Cover**

**Method**  
**Version**

**Conducted For:**

	<b>V</b> = Valid
	<b>I</b> = Invalid
	<b>N</b> = Results Cannot Be Interpreted As Representative Of Oil Performance (Non-Reference) And Shall Not Be Used In Determining An Average Test Result Using Multiple Test Criteria.

<b>Test Number</b>		
Test Stand:	Engine Run #:	
EOT Time:	EOT Date:	
Oil Code <sup>A</sup> :		
Formulation/Stand Code:		
Alternate Codes:		

In my opinion this test _____ been conducted in a valid manner in accordance with ASTM Test Method D 6750 (1K/1N) and the appropriate amendments through the information letter system. The remarks included in this report describe the anomalies associated with this test.
---

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

Submitted By: \_\_\_\_\_ Testing Laboratory

\_\_\_\_\_  
Signature

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

\_\_\_\_\_  
Title

**1K/1N  
Form 1  
Test Report Summary**

Lab	EOT Date	End Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR			
Start Date	Total Test Length	TMC Oil Type	
Laboratory Internal Oil Code			

	Correction Effective Date	WDK/WDN	TGF %	TLHC%	Transformed TLHC%	BSOC g/KW-h	EOTOC g/kW-h
Unadjusted Lab Rating							
Industry Correction(If Any)							
Subtotal							
Lab Severity Adjustment(If Any) <sup>A</sup>							
Total							

	Effective Date	WDK/WDN	TGF %	TLHC %	Transformed TLHC%	BSOC g/KW-h	EOTOC g/kW-h
Test Target Mean	A						
Test Target STD	A						
	B, C						

	Referee Lab	WDK/WDN	TGF %	
Referee Ratings				

	Top	Int. 1	Oil	Piston	Liner
Ring Loss Of Side Clearance(mm)					
Ring End Gap Increase (mm)					
Is The Ring Stuck?					
Scuffed Area %					
Average Wear Step (µm)					
% Bore Polish					

Notes: <sup>A</sup> Reference oil tests or as requested by test sponsor  
<sup>B</sup> Non-reference oil tests only  
<sup>C</sup> See Appendix X4

**1K/1N  
Form 2  
Operational Summary**

Lab	EOT Date	End Time	Method		
Stand	Run Number				
Formulation/Stand Code					
Oilcode/CMIR					
<b>Operating Condition</b>		<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>	<b>Specification</b>
Engine Speed	r/min				2100 ± 10
Engine Power	kW				Report
Fuel Flow	g/min				185 ± 1
Humidity	g/kg				17.8 ± 1.7
<b>Temperature °C</b>					
Coolant Out	°C				93 ± 2.5
Coolant In	°C				Report
Coolant delta T	°C				5 ± 1.0
Oil To Bearing	°C				107 ± 2.5
Oil Cooler In	°C				Report
Inlet Air	°C				127 ± 2.5
Exhaust	°C				550 ± 30
Fuel @ Injector Housing	°C				57 + 3
<b>Pressures</b>					
Oil To Bearing	kPa				482 Max
Oil To Jet	kPa				360 ± 13
Inlet Air	kPa				240 ± 1
Exhaust (ABS)	kPa				216 ± 1
Fuel @ Filter HSG	kPa				210 ± 20
Crankcase Vacuum	kPa				0.7 ± 0.1
Coolant Jug Pressure	kPa				Report
<b>Flows</b>					
Blowby	L/min				Report
Coolant Flow	L/min				65 ± 2
Air/Fuel Ratio: 24 hr.			Air/Fuel Ratio: 252 hr.		
<b>Assembly Measurements And Parts Record</b>					
Piston/Head Clearance mm				Intake Valve Open °ATC	
		Fuel Timing °BTC			
	Part No. (1)	Serial No. (2)	Date Code	Inspection Code	
Liner			F	G	
Ring Set (1)				I	H
Piston			D	E	

D Number blow "E" located on top of piston

(1) And (2) Number On Parts Box Yellow Label

E Number on top of "E" located on top of piston

F Four alphanumeric characters (NNAN) on liner O.D.

G Four digit number on liner O.D.

**1K/1N  
Form 3  
Operational Summary - Offset And Deviation**

Lab	EOT Date	End Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

Controlled Parameter	Allowable % Out	This Test % Out	Allowable % Off	This Test % Off
Speed	5		20	
Fuel Flow	10		25	
Humidity	10		25	
Coolant Flow	5		25	
<b>Temperatures</b>				
Coolant Out	5		20	
Oil To Bearing	5		20	
Intake Air	5		20	
Fuel At Injector Housing	5		20	
<b>Pressures</b>				
Oil Jet	5		25	
Intake Air	10		25	
Exhaust	10		25	
Fuel At Filter Housing	5		20	
Crankcase Vacuum	10		20	

**1K/1N  
Form 4  
Piston Rating Summary**

<b>Test</b>	Lab	EOT Date	END Time	Stand	Run No.	Method
Formulation/Stand Code					Oilcode	
Test Fuel	Fuel Batch	Date Rated		Rating Number	Rater	
<b>Last Stand Reference Information</b>	<b>Date Completed</b>		<b>Stand No.</b>	<b>Run No.</b>		<b>TMC Oil Code</b>
	<b>WDK/WDN</b>	<b>TGF</b>	<b>TLHC</b>	<b>Transformed TLHC</b>	<b>BSOC</b>	<b>EOTOC</b>
Last Ref. This Stand						
Industry Average						
Industry STD						

Total Piston Ratings Summary																					
	Dep. Factor	Grooves						Lands						Upper Skirt		Under Crown		Pin Bores			
		NO. 1		NO. 2		NO. 3		NO. 1		NO. 2		NO. 3		A,%	Dem.	A,%	Dem.	Front		Rear	
		A,%	Dem.	A,%	Dem.	A,%	Dem.	A,%	Dem.	A,%	Dem.	A,%	Dem.					A,%	Dem.	A,%	Dem.
<b>C A R B O N</b>																					
	HC-1.0																				
	MC-0.5																				
	LC-.25																				
	Total																				
<b>L A C Q U E R</b>	8 - 9																				
	7 - 7.9																				
	6 - 6.9																				
	5 - 5.9																				
	4 - 4.9																				
	3 - 3.9																				
	2 - 2.9																				
	1 - 1.9																				
	>0 - 0.9																				
	Clean		0		0		0		0		0		0		0		0		0		0
Total																					
Rating																					
Location Factor	1.5		1.5		25		1		1		25		50		20		0		0		
Weighted Rating																					
<b>TGF %</b>		<b>Intermediate Groove Fill %</b>				<b>WDK/WDN</b>				<b>Unweighted Deposit</b>				<b>T.L. Heavy Carbon %</b>				<b>T.L. Flaked Carbon %</b>			

**1K/1N**  
**Form 4A**  
**Piston Rating Worksheet**

Lab	EOT Date	END Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

Refer to Appendix C for an example of Piston Rating Worksheet.

**1K/1N**  
**Form 5**  
**Supplemental Piston Deposits(Groove Sides And Rings)**

Lab		EOT Date				End Time				Method				
Stand:						Run Number								
Formulation/Stand Code														
Oilcode:														
Deposit Type			Carbon			Varnish								
			HC	MC	LC	8 - 9	7 - 7.9	6 - 6.9	5 - 5.9	4 - 4.9	3 - 3.9	2 - 2.9	1 - 1.9	>0 -
<b>Groove Top And Bottom</b>	1	T												
		B												
	2	T												
		B												
	3	T												
		B												
<b>Top Bottom And Back Of Rings</b>	1	T												
		B												
		BK												
	2	T												
		B												
		BK												
	3	T												
		B												
		BK												
Additional Deposit & Condition Ratings														
Piston Crown														
Rings														
Liner														

**1K/1N  
Form 5A  
Referee Rating**

<b>Test Identification</b>																								
Lab				EOT Date				End Time				Method												
Stand				Run No.																				
Formulation/Stand Code																								
Oilcode																								
<b>Referee Rating Information</b>																								
Company				Rating Number				Date Rated				Rater												
<b>Total Piston Ratings Summary</b>																								
		<b>Grooves</b>						<b>Lands</b>						<b>Upper Skirt</b>		<b>Under Crown</b>		<b>Pin Bores</b>						
		Dep.. Factor	No. 1		No. 2		No. 3		No. 1		No. 2		No. 3		A,%	Dem.	A,%	Dem.	Front		Rear			
			A,%	DEM.	A,%	DEM.	A,%	DEM.	A,%	Dem.	A,%	Dem.	A,%	Dem.					A,%	Dem.	A,%	Dem.		
C A R B O N	HC-1.0																							
	MC-0.5																							
	LC-.25																							
	Total																							
L A C Q U E R	8 - 9																							
	7 - 7.9																							
	6 - 6.9																							
	5 - 5.9																							
	4 - 4.9																							
	3 - 3.9																							
	2 - 2.9																							
	1 - 1.9																							
	>0 - 0.9																							
	Clean		0		0		0		0		0		0		0		0		0					
	Total																							
Rating																								
Location Factor		1.5		1.5		25		1		1		25		50		20		0		0				
Weighted Rating																								
<b>TGF %</b>				<b>Intermediate Groove Fill %</b>				<b>WDK/WDN</b>				<b>Unweighted Deposit</b>				<b>Test Lab TLHC%</b>				<b>Test Lab TLHC %</b>				





**1K/1N  
Form 7  
Unscheduled Downtime & Maintenance  
Maintenance Summary**

Lab	EOT Date	END Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

Number of Downtime Occurrences			
Test Hours	Date	Downtime	Reasons
			Total Downtime (125 Hr. Max)

Other Comments	
Number of Comment Lines	





**1K/1N  
Form 8  
Ring Measurements**

Lab	EOT Date	END Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

Ring Gaps (mm)	Top	Intermediate	Oil
<b>Specifications</b>	$0.724 \pm 0.076$ mm	$0.673 \pm 0.076$ mm	$0.572 \pm 0.190$ mm
Pre-Test			
Post-Test			
Increase			

Ring Side Clearance*	A	B	C	D	Avg.	Min.	Specification
<b>Top</b>	Pre-Test						0.193+0.032 mm
	Post-Test						
	LSC						
<b>Int..</b>	Pre-Test						0.090+0.020 mm
	Post-Test						
	LSC						
<b>Oil</b>	Pre-Test						0.073 +0.016 mm
	Post-Test						
	LSC						

**\*Notes:**

1. Write "Stuck" In Place Of Dimension When Applicable.
2. Write "<0.038 mm" For Clearance When Applicable.
3. Write ">" Before Calculated Decrease Or Average Decrease Values That Incorporate A "<0.038 mm" In Calculation.
- 4 LSC: Loss Of Side Clearance.
5. Min: Intermediate And Oil Ring Minimum Side Clearance Is Measured 360° Around Piston.

**1K/1N  
Form 9  
Liner Measurements**

Lab	EOT Date	END Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

<b>Liner Surface Finish (Micrometer)</b>			
Distance From Top	Transverse	Longitudinal	Average
130 mm			
50 mm			
25 mm			
			Total Average

<b>% Liner Bore Polish - Grid (Add T/AT Values From Grid)</b>	
Thrust	
Anti-Thrust	
Total	

<b>Liner Bore Measurement (mm)</b>				
<b>Before Test – Diameter (Dial Bore Gage)</b>				
Bore Height	Longitudinal	Transverse		
230 mm				
130 mm				
50 mm				
25 mm				
15 mm				
<b>After Test - (Surface Profile)</b>				
	Longitudinal		Transverse	
	Front	Rear	T	AT
Wear Step @ 15mm				

**1K/1N  
Form 10  
Characteristics Of The Data Acquisition System**

Lab	EOT Date	END Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

Parameter (1)	Sensing Device (2)	Calibration Frequency (3)	Record Device (4)	Observation Frequency (5)	Record Frequency (6)	Log Frequency (7)	System Response (8)
<b>Operation Conditions</b>							
Engine Speed (R\min)							
Engine Power (kW)							
Fuel Flow (g/min)							
Humidity (g/kg)							
Coolant Out							
Coolant In							
Oil To Bearing							
Oil Cooler In							
Inlet Air							
Exhaust							
Fuel							
<b>Pressures (kPa)</b>							
Oil To Bearing							
Oil To Jet							
Inlet Air							
Exhaust							
Fuel @ Filter HSG							
Crankcase VAC							
<b>Flows (L/min)</b>							
Blowby							
Coolant Flow							

**Legend:**

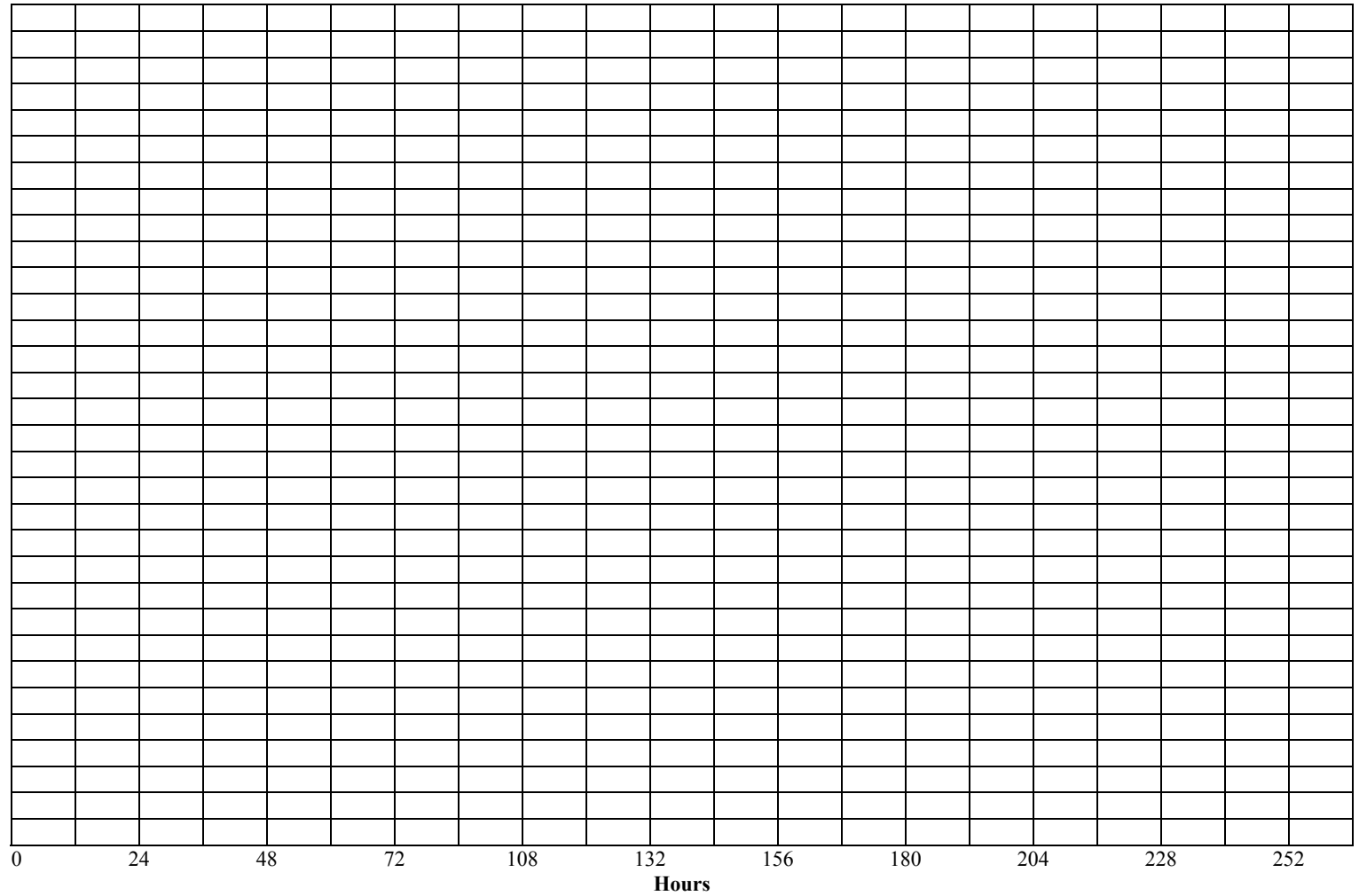
- (1) Operating Parameter
- (2) The Type Of Device Used To Measure Temperature, Pressure Or Flow
- (3) Frequency At Which The Measurement System Is Calibrated
- (4) The Type Of Device Where Data Is Recorded
  - LG – Hanglog Sheet
  - DL - Automatic Data Logger
  - C/M - Computer, Using Manual Data Entry
  - SC - Strip Chart Recorder
  - C/D - Computer, Using Direct I/O Entry

- (5) Data Area Observed But Only Recorded If 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

**1K/1N  
Form 11**

Lab	EOT Date	End Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

Inlet Air	130
C	127
	124
Oil to	110
Bearing	107
C	104
Coolant In	91
C	88
	85
Coolant Out	96
C	93
	90
Exhaust	580
C	550
	520
Fuel Rate	186
g/min	185
	184
Engine Speed	2110
r/min	2100
	2090
Power	57
kW	52
	47

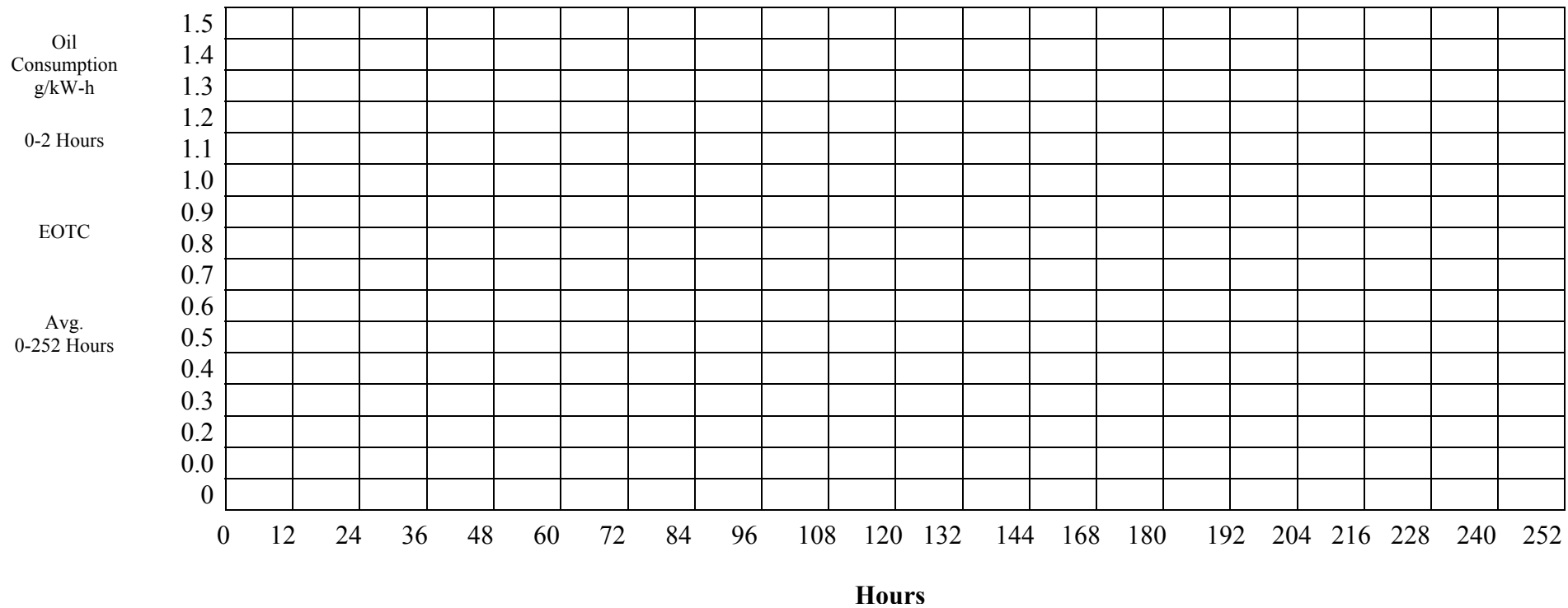






**1K/1N  
Form 13  
Oil Consumption Plot**

Lab	EOT Date:	End Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			



**1K/IN**  
**Form 14**  
**Piston, Ring And Liner Photographs**

Lab	EOT DATE:	End Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

Refer to Appendix C for example of Photo Layout.







**1K/1N**  
**Form 16**  
**TMC Control Chart Analysis**

Lab	EOT Date	End Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			

Refer to Appendix C for example of Control Chart Analysis page.

**1K/1N**  
**Form 17**  
**Fuel Batch Analysis**

Lab	EOT Date	End Time	Method
Stand	Run Number		
Formulation/Stand Code			
Oilcode/CMIR:			



**1K/1N**  
**Form 18**  
**American Chemistry Council Code of Practice**  
**Test Laboratory Conformance Statement**

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

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)*

	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

\_\_\_\_\_  
Date

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

\_\_\_\_\_  
Title