ROBO

Status Update

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May 12, 2009

ASTM Main Committee Ballot

- Passing D02.B ballot
  - No negatives [125 Affirm – 0 Negative – 352 Abstain]
  - Three commentators – some comments to be incorporated
  - Editorial in nature

- Final editorial board approval obtained - April 15
  - 4-6 weeks to publish

ASTM D7528

Standard Test Method for Bench Oxidation of Engine Oils by ROBO Apparatus

ROBO versus Seq IIIG
Overall Precision

	Intermediate Precision		Reproducibility	
	Standard Deviation	IP	Standard Deviation	R
MRV ROBO	0.25	0.70	0.40	1.12
Seq IIIGA	0.57	1.60	0.57	1.60
pVis ROBO	0.191	0.535	0.267	0.748
SEQ IIIG	0.392	1.098	0.392	1.098

ROBO 7 oils / Seq IIIG 3 oils

Units transformed to ln (result)

Use of Precision Statement (I)

- Overall precision is impacted by oils which exhibit yield stress
- Reproducibility of those oils which do not exhibit yield stress is significantly better than that for entire set of oils
  - ROBO – R one standard deviation
    - 0.24 oils w/o YS versus 0.40 all oils

Use of Precision Statement (II)

If MRV Viscosity = 40,000

ln(40000) = 10.60

Seq IIIGA – Intermediate Precision = 1.60

10.60 +/- 1.6 gives 9.00 and 12.20

exp(9.00) = 8,100 and exp(12.20) = 199,000

ROBO – Intermediate Precision = 0.70

10.60 +/- 0.70 gives 9.90 and 11.30

exp(9.90) = 19,900 and exp(11.30) = 80,800

Use of Precision Statement (III)

Intermediate Precision			Reproducibility	
Seq IIIGA	ROBO		Seq IIIGA	ROBO
1.6	0.7		1.6	1.12

MRV Viscosity	ln Visc	Difference ln (x) – **10.13**
25000	**10.13**	Base Case
50500	10.83	0.703
77000	11.25	1.125
124000	11.73	1.601

Precision is impacted by oils with yield stress

Summary

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