Test Monitoring Center

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A Program of ASTM International

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ASTM consensus has not yet been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: EOEC Mailing List

SUBJECT: Addition of Passenger Car Elastomer Test Precision Estimates

The Engine Oil Elastomer Compatibility Surveillance Panel previously approved and added five new elastomers to Test Method D 7216. These elastomers are used in passenger car, spark ignition engines and will be required for ILSAC GF-5. Test precision estimates for these elastomers have now been added to Annex A2.

The updated sections of Test Method D 7216 are attached and are effective the date of this information letter.

Becky Grinfield
EOEC Surveillance Panel Chairman
Southwest Research Institute

John L. Zalar
Administrator
ASTM Test Monitoring Center

Attachment

c: ftp://ftp.astmtmc.cmu.edu/docs/bench/eoec/procedure_and_ils/il09-01.pdf

Distribution: Email

(Revises Test Method D 7216-09)

A2.6 Precision and Bias

A2.6.1 Test precision is established on the basis of reference oil test results (for operationally valid tests) monitored by the ASTM Test Monitoring Center. The data are reviewed semi-annually by the Engine Oil Elastomer Compatibility Surveillance Panel. Contact the ASTM TMC for current industry data.

A2.6.2 Tables A2.2 through A2.6 summarize reference oil intermediate precision and reproducibility of the test. The tabulated values are current as of April 2009. The Surveillance Panel updates these values as necessary.

A2.6.3 *Intermediate Precision Conditions*— Conditions where test results are obtained with the same test method using the same test oil, with changing conditions such as operators, measuring equipment, test stands, test engines, and time.

NOTE 9—Intermediate precision is the appropriate term for this test method rather than repeatability which defines more rigorous within-laboratory conditions.

A2.6.4 *Intermediate Precision Limit (i.p.)*—The difference between two results obtained under intermediate precision conditions that in the long run, in the normal and correct conduct of the test method, exceed the values shown in Tables A2.2 through A2.6 in only one case in twenty. When only a single test result is available, the Intermediate Precision Limit can be used to calculate a range (test result ± Intermediate Precision Limit) outside of which a second test result would be expected to fall about one time in twenty.

A2.6.4 *Reproducibility Conditions*—Conditions where test results are obtained with the same test method using the same test oil in different laboratories with different operators using different equipment.

A2.6.5 *Reproducibility Limit (R)*—The difference between two results obtained under reproducibility conditions that would, in the long run, in the normal and correct conduct of the test method, exceed the values in Tables A2.2 through A2.6 in only one case in twenty. When only a single test result is available, the Reproducibility Limit can be used to calculate a range (test result ± Reproducibility Limit) outside of which a second test result would be expected to fall about one time in twenty.

A2.6.6 *Bias*—No estimate of the bias for the procedure is possible because the performance results for an oil are determined only under the specific conditions of the test and no absolute standards exist.

TABLE A2.2 Hydrogenated Nitrile (HNBR-1) Reference Oil Precision Data

NOTE—These statistics are based on results obtained on Test Monitoring Center reference oil 1006-1 between March19, 2009 and April 30, 2009.

Variable	$s_{i.p.}$	i.p.	s_R	R
Volume Change, %	0.14	0.39	0.19	0.53
Hardness Change, Points	0.47	1.32	0.87	2.44
Tensile Strength Change, %	4.11	11.51	4.71	13.19
Elongation Change, %	4.71	13.19	9.60	26.88
Tensile Stress Change @ 50% Elongation, %	5.62	15.74	9.35	26.18

TABLE A2.3 Polyacrylate (ACM-1) Reference Oil Precision Data

NOTE—These statistics are based on results obtained on Test Monitoring Center reference oil 1006-1 between March19, 2009 and April 30, 2009.

Variable	$s_{i.p.}$	i.p.	s_R	R
Volume Change, %	0.16	0.45	0.17	0.48
Hardness Change, Points	0.37	1.04	0.61	1.71
Tensile Strength Change, %	3.76	10.53	4.95	13.86
Elongation Change, %	11.47	32.12	12.29	34.41
Tensile Stress Change @ 50% Elongation, %	17.60	49.28	22.23	62.24

TABLE A2.4 Fluoroelastomer (FKM-1) Reference Oil Precision Data

NOTE—These statistics are based on results obtained on Test Monitoring Center reference oil 1006-1 between March19, 2009 and April 30, 2009.

Variable	$s_{i.p.}$	i.p.	s_R	R
Volume Change, %	0.14	0.39	0.18	0.50
Hardness Change, Points	0.52	1.46	1.04	2.91
Tensile Strength Change, %	4.39	12.29	6.51	18.23
Elongation Change, %	2.13	5.96	4.31	12.07
Tensile Stress Change @ 50% Elongation, %	2.79	7.81	20.91	58.55

TABLE A2.5 Silicone (VMQ-1) Reference Oil Precision Data

NOTE—These statistics are based on results obtained on Test Monitoring Center reference oil 1006-1 between March19, 2009 and April 30, 2009.

Variable	$s_{i.p.}$	i.p.	s_R	R
Volume Change, %	0.85	2.38	2.67	7.48
Hardness Change, Points	1.16	3.25	2.83	7.92
Tensile Strength Change, %	2.58	7.22	3.02	8.46
Elongation Change, %	3.84	10.75	7.25	20.3
Tensile Stress Change @ 50% Elongation, %	3.61	10.11	11.52	32.26

TABLE A2.6 Ethylene Acrylate (AEM-1) Reference Oil Precision Data

NOTE—These statistics are based on results obtained on Test Monitoring
Center reference oil 1006-1 between March19, 2009 and April 30, 2009.

Variable	$s_{i.p.}$	i.p.	s_R	R
Volume Change, %	0.49	1.37	0.49	1.37
Hardness Change, Points	0.72	2.02	0.72	2.02
Tensile Strength Change, %	2.58	7.22	2.69	7.53
Elongation Change, %	3.84	10.75	5.21	14.59
Tensile Stress Change @ 50% Elongation, %	3.61	10.11	11.52	32.26

Legend:

$s_{i.p.}$ = intermediate precision standard deviation.

i.p. = intermediate precision.

s_R = reproducibility standard deviation.

R = reproducibility.