ASTM D5769 QC Standards

Quality Control Standards to determine benzene, toluene, and total aromatics in finished gasoline by GC/MS

AccuStandard®

ASTM D5769 Benzene, Toluene & Total Aromatics

Quality Control Standards to determine benzene, toluene, and total aromatics in finished gasoline, including gasolines containing oxygenated blending components by GC/MS

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

Calibration Curve with No Internal Standard

Six Level Calibration Curve without Internal Standard

D-5769-CAL6-5ML-SET — 6 x 5 mL
D-5769-CAL6-10ML-SET — 6 x 10 mL

Core Calibration Mix 24 comps.	Target Wt.%	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%
Benzene	5.25	2.95	1.575	0.8144	0.4143	4.16	
Toluene	19.67	11.06	5.898	3.0505	1.5519	16.41	
Ethylbenzene	5.18	2.91	1.552	0.8026	0.4083	4.10	
m-Xylene	6.19	3.48	1.856	0.9598	0.4883	4.91	
p-Xylene	6.19	3.48	1.856	0.9598	0.4883	4.91	
o-Xylene	6.30	3.54	1.890	0.9776	0.4973	5.00	
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435	2.45	
n-Propylbenzene	3.09	1.74	0.926	0.4787	0.2435	2.45	
3-Ethyltoluene	3.10	1.74	0.928	0.4801	0.2442	2.45	
4-Ethyltoluene	3.08	1.73	0.925	0.4782	0.2433	2.44	
1,3,5-Trimethylbenzene	3.10	1.74	0.929	0.4804	0.2444	2.46	
2-Ethyltoluene	3.15	1.77	0.945	0.4890	0.2488	2.50	
1,2,4-Trimethylbenzene	5.23	2.94	1.567	0.8104	0.4123	4.14	
1,2,3-Trimethylbenzene	3.20	1.80	0.960	0.4965	0.2526	2.54	
Indan	3.45	1.94	1.034	0.5350	0.2722	2.73	
1,4-Diethylbenzene	3.09	1.74	0.925	0.4786	0.2435	2.45	
n-Butylbenzene	3.08	1.73	0.923	0.4776	0.2430	2.44	
1,2-Diethylbenzene	3.15	1.77	0.945	0.4885	0.2485	2.50	
1,2,4,5-Tetramethylbenzene	2.12	1.19	0.635	0.3284	0.1671	1.68	
1,2,3,5-Tetramethylbenzene	2.12	1.19	0.637	0.3295	0.1676	1.68	
Naphthalene	2.37	1.34	0.712	0.3683	0.1874	1.88	
1-Methylnaphthalene	2.37	1.34	0.712	0.3683	0.1874	1.88	
2-Methylnaphthalene	2.43	1.37	0.730	0.3773	0.1919	1.93	
Isooctane	-----	43.77	70.015	84.4922	92.1105	19.92	

Five Level Calibration Curve Without Internal Standard

D-5769-CAL-5ML-SET — 5 x 5 mL (Std. 1 to Std 5)
D-5769-CAL-10ML-SET — 5 x 10 mL (Std. 1 to Std 5)

Additional Calibration Level Without Internal Standard

D-5769-ADD-5ML — 1 x 5 mL (Std. 6)
D-5769-ADD-10ML — 1 x 10 mL (Std. 6)

Technical Note

A sixth standard has been formulated to improve the linearity at the high end of the calibration curve. This can be helpful in the quantification of gasoline containing high levels of toluene.

CD Provided

CALAMTS
Contains Calibration Amounts

Each analyte is individually weighed. Actual weights and weight percents are provided.

Daily Quality Control Standard Without Internal Standard

D-5769-QC-15ML — 1 x 15 mL
D-5769-QC-15ML-PAK — 5 x 15 mL

D-5769-QC-10ML — 1 x 10 mL
D-5769-QC-10ML-PAK *SAVE* — 5 x 10 mL
At stated Wt.% — 14 comps.

n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	2
Benzene	1	Naphthalene	1

4 comp. Deuterated Internal Std. Mix

M-GRA-IS-R-10ML — 1 x 10 mL
M-GRA-IS-R-10ML-PAK *SAVE* — 5 x 10 mL
At stated Wt.% — 4 comps.

Benzene-d_6	16.67	Naphthalene-d_8	8.77
Ethylbenzene-d_{10}	16.65	Toluene-d_8	57.91

3 comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML — 1 x 5 mL
M-GRA-IS-5ML-PAK *SAVE* — 5 x 5 mL
At stated Wt.% — 3 comps.

Benzene-d_6	40	Naphthalene-d_8	20
Ethylbenzene-d_{10}	40		

ASTM D5769 Benzene, Toluene & Total Aromatics

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

Calibration Curve with 3 Component Internal Standard

Six Level Calibration Curve with Internal Standard

D-5769-CAL6-IS-SET — 6 x 1 mL

Core Calibration Mix 24 Comps.	Target Wt.%	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%
Benzene		5.25	2.95	1.575	0.8144	0.4143	4.16
Toluene		19.67	11.06	5.898	3.0505	1.5519	16.41
Ethylbenzene		5.18	2.91	1.552	0.8026	0.4083	4.10
m-Xylene		6.19	3.48	1.856	0.9598	0.4883	4.91
p-Xylene		6.19	3.48	1.856	0.9598	0.4883	4.91
o-Xylene		6.30	3.54	1.890	0.9776	0.4973	5.00
Isopropylbenzene		3.09	1.74	0.925	0.4786	0.2435	2.45
n-Propylbenzene		3.09	1.74	0.926	0.4787	0.2435	2.45
3-Ethyltoluene		3.10	1.74	0.928	0.4801	0.2442	2.45
4-Ethyltoluene		3.08	1.73	0.925	0.4782	0.2433	2.44
1,3,5-Trimethylbenzene		3.10	1.74	0.929	0.4804	0.2444	2.46
2-Ethyltoluene		3.15	1.77	0.945	0.4890	0.2488	2.50
1,2,4-Trimethylbenzene		5.23	2.94	1.567	0.8104	0.4123	4.14
1,2,3-Trimethylbenzene		3.20	1.80	0.960	0.4965	0.2526	2.54
Indan		3.45	1.94	1.034	0.5350	0.2722	2.73
1,4-Diethylbenzene		3.09	1.74	0.925	0.4786	0.2435	2.45
n-Butylbenzene		3.08	1.73	0.923	0.4776	0.2430	2.44
1,2-Diethylbenzene		3.15	1.77	0.945	0.4885	0.2485	2.50
1,2,4,5-Tetramethylbenzene		2.12	1.19	0.635	0.3284	0.1671	1.68
1,2,3,5-Tetramethylbenzene		2.12	1.19	0.637	0.3295	0.1676	1.68
Naphthalene		2.37	1.34	0.712	0.3683	0.1874	1.88
1-Methylnaphthalene		2.37	1.34	0.712	0.3683	0.1874	1.88
2-Methylnaphthalene		2.43	1.37	0.730	0.3773	0.1919	1.93
Isooctane		-----	43.77	70.015	84.4922	92.1105	19.92

Internal Standard
M-GRA-IS

3 Comps.	Target Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%
Benzene-d_6		2	2	2	2	2	2
Ethylbenzene-d_{10}		2	2	2	2	2	2
Naphthalene-d_8		1	1	1	1	1	1

Five Level Calibration Curve With Internal Standard

D-5769-CAL-IS-SET — 5 x 1 mL (Std. 1 to Std 5)

Additional Calibration Level With Internal Standard

D-5769-ADD-IS — 1 x 1 mL (Std. 6)

Technical Note

A sixth standard has been formulated to improve the linearity at the high end of the calibration curve. This can be helpful in the quantification of gasoline containing high levels of toluene.

CD Provided

CALAMTS
Contains Calibration Amounts

Each analyte is individually weighed. Actual weights and weight percents are provided.

Includes Internal Standard

M-GRA-IS (3 comp.) combined with the Core Calibration Curve Mixes (24 comps.) above in a 5 to 100 weight ratio to formulate these calibration solutions (27 comp).

Daily Quality Control Standard

With Internal Standard

D-5769-QC-IS-15ML — 1 x 15 mL
D-5769-QC-IS-15ML-PAK — 5 x 15 mL

D-5769-QC-IS-5ML — 1 x 5 mL
D-5769-QC-IS-5ML-PAK — *SAVE* — 5 x 5 mL
At stated Wt.% — 17 comps.

n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	2
Benzene	1	Naphthalene	1

Includes
M-GRA-IS (3 comp. mix) added in 5 to 100 weight ratio

Resolution Standard

M-GRA-RES — 1 x 1 mL
M-GRA-RES-PAK — *SAVE* — 5 x 1 mL
At stated Wt.% — 3 comps.

1,3,5-Trimethylbenzene	3.0
1-Methyl-2-ethylbenzene	3.0
Isooctane	94.0

Deuterated Internal Standard Mix

M-GRA-IS-5ML — 1 x 5 mL
M-GRA-IS-5ML-PAK — *SAVE* — 5 x 5 mL
At stated Wt.% — 3 comps.

Benzene-d_6	40	Naphthalene-d_8	20
Ethylbenzene-d_{10}	40		

Sensitivity Test Solution

M-GRA-ST — 1 x 1 mL
M-GRA-ST-PAK — *SAVE* — 5 x 1 mL
100 µg/mL in Isooctane

1,4-Diethylbenzene

Fragmentation Pattern Standard

M-GRA-FP — 1 x 1 mL
M-GRA-FP-PAK — *SAVE* — 5 x 1 mL
3.0 Wt.% in Isooctane

1,2,3-Trimethylbenzene

Mass Scan Range Standard

M-GRA-MSR — 1 x 1 mL
M-GRA-MSR-PAK — *SAVE* — 5 x 1 mL
3.0 Wt.% in Isooctane

Toluene

ASTM D5769 Benzene, Toluene & Total Aromatics

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

With 4 Component Internal Standard (includes Toluene-d_8)

Six Level Calibration Curve with Deuterated Toluene
With Internal Standard

D-5769-CAL6-IS-R-SET — **6 x 1 mL**

Core Calibration Mix 24 Comps.	Target Wt.%	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%
Benzene		5.25	2.95	1.575	0.8144	0.4143	4.16
Toluene		19.67	11.06	5.898	3.0505	1.5519	16.41
Ethylbenzene		5.18	2.91	1.552	0.8026	0.4083	4.10
m-Xylene		6.19	3.48	1.856	0.9598	0.4883	4.91
p-Xylene		6.19	3.48	1.856	0.9598	0.4883	4.91
o-Xylene		6.30	3.54	1.890	0.9776	0.4973	5.00
Isopropylbenzene		3.09	1.74	0.925	0.4786	0.2435	2.45
n-Propylbenzene		3.09	1.74	0.926	0.4787	0.2435	2.45
3-Ethyltoluene		3.10	1.74	0.928	0.4801	0.2442	2.45
4-Ethyltoluene		3.08	1.73	0.925	0.4782	0.2433	2.44
1,3,5-Trimethylbenzene		3.10	1.74	0.929	0.4804	0.2444	2.46
2-Ethyltoluene		3.15	1.77	0.945	0.4890	0.2488	2.50
1,2,4-Trimethylbenzene		5.23	2.94	1.567	0.8104	0.4123	4.14
1,2,3-Trimethylbenzene		3.20	1.80	0.960	0.4965	0.2526	2.54
Indan		3.45	1.94	1.034	0.5350	0.2722	2.73
1,4-Diethylbenzene		3.09	1.74	0.925	0.4786	0.2435	2.45
n-Butylbenzene		3.08	1.73	0.923	0.4776	0.2430	2.44
1,2-Diethylbenzene		3.15	1.77	0.945	0.4885	0.2485	2.50
1,2,4,5-Tetramethylbenzene		2.12	1.19	0.635	0.3284	0.1671	1.68
1,2,3,5-Tetramethylbenzene		2.12	1.19	0.637	0.3295	0.1676	1.68
Naphthalene		2.37	1.34	0.712	0.3683	0.1874	1.88
1-Methylnaphthalene		2.37	1.34	0.712	0.3683	0.1874	1.88
2-Methylnaphthalene		2.43	1.37	0.730	0.3773	0.1919	1.93
Isooctane		-----	43.77	70.015	84.4922	92.1105	19.92

Internal Standard
M-GRA-IS-R

4 Comps.	Target Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%
Benzene-d_6		2	2	2	2	2	2
Ethylbenzene-d_{10}		2	2	2	2	2	2
Naphthalene-d_8		1	1	1	1	1	1
Toluene-d_8		7	7	7	7	7	7

M-GRA-IS-R Internal Standard (4 comp.) is combined with the Core Calibration Curve Mixes (24 comp.) above in a 12 to 100 weight ratio to formulate these Calibration Solutions (28 comps.)

Five Level Calibration Curve
With Internal Standard

D-5769-CAL-IS-R-SET — **5 x 1 mL (Std. 1 to Std 5)**

Additional Calibration Level
With Internal Standard

D-5769-ADD-IS-R — **1 x 1 mL (Std. 6)**

Technical Note
A sixth standard has been formulated to improve the linearity at the high end of the calibration curve. This can be helpful in the quantification of gasoline containing high levels of toluene.

CD Provided
CALAMTS
Contains Calibration Amounts

Each analyte is individually weighed. Actual weights and weight percents are provided.

Daily Quality Control Standard
With Internal Standard

D-5769-QC-IS-R-5ML — **1 x 5 mL**
D-5769-QC-IS-R-5ML-PAK *SAVE* — **5 x 5 mL**

D-5769-QC-IS-15ML — **1 x 15 mL**
At stated Wt.% — 18 comps.

n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	2
Benzene	1	Naphthalene	1

Includes M-GRA-IS-R (4 comp.) added in 12 to 100 weight ratio

Deuterated Internal Standard Mix

M-GRA-IS-R-10ML — **1 x 10 mL**
M-GRA-IS-R-10ML-PAK *SAVE* — **5 x 10 mL**
At stated Wt.% — 4 comps.

Benzene-d_6	16.67	Naphthalene-d_8	8.77
Ethylbenzene-d_{10}	16.65	Toluene-d_8	57.91

Sensitivity Test Solution

M-GRA-ST — **1 x 1 mL**
M-GRA-ST-PAK *SAVE* — **5 x 1 mL**
100 µg/mL in Isooctane

1,4-Diethylbenzene

Resolution Standard

M-GRA-RES — **1 x 1 mL**
M-GRA-RES-PAK *SAVE* — **5 x 1 mL**
At stated Wt.% — 3 comps.

1,3,5-Trimethylbenzene	3.0
1-Methyl-2-ethylbenzene	3.0
Isooctane	94.0

Fragmentation Pattern Standard

M-GRA-FP — **1 x 1 mL**
M-GRA-FP-PAK *SAVE* — **5 x 1 mL**
3.0 Wt.% in Isooctane

1,2,3-Trimethylbenzene

ASTM D5769 Benzene, Toluene & Total Aromatics

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

These standards and methods are used in the monitoring of total aromatics according to the methods and amendments to the US Clean Air Act. Amendments containing more stringent specifications are in effect and can be found listed under this method.

Calibration Curve with 3 Component Deuterated Internal Standard Added

Aromatics Calibration Standards Kit

Internal Standard Version

M-GRA-CAL-IS-SET — **5 x 1 mL**

Core Calibration Mix 24 Comps.	Std. 1 Target Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %
Benzene	3	1.50	0.75	0.375	0.1875
Toluene	19	9.50	4.75	2.375	1.1875
Ethylbenzene	5	2.50	1.25	0.625	0.3125
m-Xylene	6	3.00	1.50	0.750	0.3750
p-Xylene	6	3.00	1.50	0.750	0.3750
o-Xylene	6	3.00	1.50	0.750	0.3750
Isopropylbenzene	3	1.50	0.75	0.375	0.1875
n-Propylbenzene	3	1.50	0.75	0.375	0.1875
3-Ethyltoluene	3	1.50	0.75	0.375	0.1875
4-Ethyltoluene	3	1.50	0.75	0.375	0.1875
1,3,5-Trimethylbenzene	3	1.50	0.75	0.375	0.1875
2-Ethyltoluene	3	1.50	0.75	0.375	0.1875
1,2,4-Trimethylbenzene	5	2.50	1.25	0.625	0.3125
1,2,3-Trimethylbenzene	3	1.50	0.75	0.375	0.1875
Indan	3	1.50	0.75	0.375	0.1875
1,4-Diethylbenzene	3	1.50	0.75	0.375	0.1875
n-Butylbenzene	3	1.50	0.75	0.375	0.1875
1,2-Diethylbenzene	3	1.50	0.75	0.375	0.1875
1,2,4,5-Tetramethylbenzene	2	1.00	0.50	0.250	0.1250
1,2,3,5-Tetramethylbenzene	2	1.00	0.50	0.250	0.1250
Naphthalene	2	1.00	0.50	0.250	0.1250
Pentamethylbenzene	2	1.00	0.50	0.250	0.1250
1-Methylnaphthalene	2	1.00	0.50	0.250	0.1250
2-Methylnaphthalene	2	1.00	0.50	0.250	0.1250
Isooctane	--	47.5	71.25	83.15	89.05
M-GRA-IS (Internal Standard)					
Benzene-d_6	2	2	2	2	2
Ethylbenzene-d_{10}	2	2	2	2	2
Naphthalene-d_8	1	1	1	1	1

Optional Sixth Standard

Internal Standard Added

M-GRA-ADD-IS — **1 x 1 mL**

Core Calibr. Mix 24 Comps.	Optional Std. 6 Target Vol. %
Benzene	2.25
Toluene	15
Ethylbenzene	3.75
m-Xylene	4.50
p-Xylene	4.50
o-Xylene	4.50
Isopropylbenzene	2.25
n-Proplylbenzene	2.25
3-Ethyltoluene	2.25
4-Ethyltoluene	2.25
1,3,5-Trimethylbenzene	2.25
2-Ethyltoluene	2.25
1,2,4-Trimethylbenzene	3.75
1,2,3-Trimethylbenzene	2.25
Indan	2.25
1,4-Diethylbenzene	2.25
n-Butylbenzene	2.25
1,2-Diethylbenzene	2.25
1,2,4,5-Tetramethylbenzene	4.0
1,2,3,5-Tetramethylbenzene	1.5
Naphthalene	1.5
Pentamethylbenzene	1.5
1-Methylnaphthalene	1.5
2-Methylnaphthalene	1.5
Isooctane	20.5
M-GRA-IS (Internal Standard)	
Benzene-d_6	2
Ethylbenzene-d_{10}	2
Naphthalene-d_8	1

CD Provided

CALAMTS

Contains Calibration Amounts

Each analyte is individually weighed. Actual weights and weight percents are provided.

Daily Quality Control Standard

Without Internal Standard

M-GRA-QC-10ML — **1 x 10 mL**

M-GRA-QC-10ML-PAK *SAVE* — **5 x 10 mL**

At stated Wt.% — 13 comps.

n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1		

Daily Quality Control Standard

With Internal Standard

M-GRA-QC-IS-5ML — **1 x 5 mL**

M-GRA-QC-IS-5ML-PAK *SAVE* — **5 x 5 mL**

At stated Wt.% — 16 comps.

n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1	13 comp. Core Mix	100

Includes **M-GRA-IS** (3 comp. Internal Standards mix) combined with the above 13 comp. Core Mix in a 5 to 100 weight ratio.

ASTM/EPA Sensitivity Test Solution

M-GRA-ST — **1 x 1 mL**

M-GRA-ST-PAK *SAVE* — **5 x 1 mL**

100 µg/mL in Isooctane

1,4-Diethylbenzene

3 Comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML — **1 x 5 mL**

M-GRA-IS-5ML-PAK *SAVE* — **5 x 5 mL**

At stated Wt.% — 3 comps.

Benzene-d_6	40	Naphthalene-d_8	20
Ethylbenzene-d_{10}	40		

Aromatics for Analysis by GC/MS (Daily QC Standards) Sets

Original Formulations

M-GRA-K1-SET — **Set**

Set includes:	Units
M-GRA-CAL-IS-SET	5 x 1 mL
M-GRA-QC-IS-5ML	1 x 5 mL
M-GRA-IS-5ML	1 x 5 mL
M-GRA-ST	1 x 1 mL

Revision 5 F

M-GRA-K2-SET — **Set**

Set includes:	Units
M-GRA-CAL-IS-SET	5 x 1 mL
M-GRA-ADD-IS	1 x 1 mL
M-GRA-QC-IS-5ML	1 x 5 mL
M-GRA-IS-5ML	1 x 5 mL
M-GRA-ST	1 x 1 mL

ASTM D5769 Benzene, Toluene & Total Aromatics

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

Calibration Curve with 4 Component Deuterated Internal Standard Added

Aromatics Calibration Standards Kit

With Internal Standard

M-GRA-CAL-R-IS-R-SET — **5 x 1 mL**

Core Calibration Mix 24 comps.	Std. 1 Target Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%
Benzene	3.13	1.78	0.95	0.490	0.2490
Toluene	19.65	11.11	5.90	3.058	1.5547
Ethylbenzene	5.12	2.92	1.55	0.805	0.4090
m-Xylene	6.27	3.50	1.86	0.962	0.4891
p-Xylene	6.33	3.50	1.86	0.962	0.4891
o-Xylene	6.51	3.56	1.89	0.980	0.4891
Isopropylbenzene	3.06	1.74	0.93	0.480	0.2439
n-Propylbenzene	3.04	1.74	0.93	0.480	0.2440
3-Ethyltoluene	3.08	1.75	0.93	0.481	0.2446
4-Ethyltoluene	3.05	1.74	0.93	0.479	0.2437
1,3,5-Trimethylbenzene	3.07	1.75	0.93	0.481	0.2448
2-Ethyltoluene	3.14	1.78	0.95	0.490	0.2492
1,2,4-Trimethylbenzene	5.18	2.95	1.57	0.812	0.4130
1,2,3-Trimethylbenzene	3.19	1.81	0.96	0.498	0.2530
Indan	3.46	1.95	1.04	0.536	0.2726
1,4-Diethylbenzene	3.04	1.74	0.93	0.480	0.2439
n-Butylbenzene	3.05	1.74	0.92	0.479	0.2434
1,2-Diethylbenzene	3.22	1.78	0.95	0.490	0.2489
1,2,4,5-Tetramethylbenzene	2.10	1.20	0.64	0.329	0.1674
1,2,3,5-Tetramethylbenzene	2.09	1.20	0.64	0.330	0.1679
Naphthalene	2.35	1.34	0.71	0.369	0.1877
Pentamethylbenzene	2.16	1.23	0.66	0.340	0.1727
1-Methylnaphthalene	2.23	1.34	0.71	0.369	0.1877
2-Methylnaphthalene	2.41	1.37	0.73	0.378	0.1922
Isooctane	-----	43.47	69.96	84.441	92.0905
M-GRA-IS-R (Internal Standard)			*At stated Wt.%*		
Benzene-d_6	16.57	16.57	16.57	16.57	16.57
Ethylbenzene-d_{10}	16.76	16.76	16.76	16.76	16.76
Naphthalene-d_8	8.78	8.78	8.78	8.78	8.78
Toluene-d_8	57.88	57.88	57.88	57.88	57.88

Optional Sixth Standard

With Internal Standard

M-GRA-ADD-IS-R — **1 x 1 mL**

Core Calibr. Mix 24 comps.	Optional Std. 6 Target Wt.%
Benzene	2.48
Toluene	16.29
Ethylbenzene	4.07
m-Xylene	4.87
p-Xylene	4.87
o-Xylene	4.96
Isopropylbenzene	2.43
n-Propylbenzene	2.43
3-Ethyltoluene	2.44
4-Ethyltoluene	2.43
1,3,5-Trimethylbenzene	2.44
2-Ethyltoluene	2.48
1,2,4-Trimethylbenzene	4.11
1,2,3-Trimethylbenzene	2.52
Indan	2.71
1,4-Diethylbenzene	2.43
n-Butylbenzene	2.42
1,2-Diethylbenzene	2.48
1,2,4,5-Tetramethylbenzene	4.44
1,2,3,5-Tetramethylbenzene	1.67
Naphthalene	1.87
Pentamethylbenzene	1.72
1-Methylnaphthalene	1.87
2-Methylnaphthalene	1.91
Isooctane	17.67
M-GRA-IS-R (ISTD)	*At stated Wt.%*
Benzene-d_6	16.57
Ethylbenzene-d_{10}	16.76
Naphthalene-d_8	8.78
Toluene-d_8	57.88

Technical Note

This set of calibration solutions was formulated to improve the quantification of toluene by using toluene-d_8 as an additional ISTD.

M-GRA-IS-R Internal Standard Mix (4 comps.) is combined with the Core Calibration Curve Mixes (25 comps.) in a 12 to 100 weight ratio to formulate a complete calibration solution containing 29 components.

Daily Quality Control Standard

Without Internal Standard

M-GRA-QC-10ML — **1 x 10 mL**
M-GRA-QC-10ML-PAK *SAVE* — **5 x 10 mL**
At stated Wt.% — 13 comps.

n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1		

Deuterated Internal Standard Mix

M-GRA-IS-R-10ML — **1 x 10 mL**
M-GRA-IS-R-10ML-PAK *SAVE* — **5 x 10 mL**
At stated Wt.% — 4 comps.

Benzene-d_6	16.67	Naphthalene-d_8	8.77
Ethylbenzene-d_{10}	16.65	Toluene-d_8	57.91

ASTM/EPA Sensitivity Test Solution

M-GRA-ST — **1 x 1 mL**
M-GRA-ST-PAK *SAVE* — **5 x 1 mL**
100 µg/mL in Isooctane

1,4-Diethylbenzene

Daily Quality Control Standard

With Internal Standard

M-GRA-QC-IS-R-5ML — **1 x 5 mL**
M-GRA-QC-IS-R-5ML-PAK *SAVE* — **5 x 5 mL**
At stated Wt.% — 17 comps.

n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1	Core Mix (13 comps.)	100

Includes Internal Standard

M-GRA-IS-R (4 comp.) combined with the above Core Mix (13 comps.) in a 12 to 100 weight ratio.

Aromatics for Analysis by GC/MS (Daily QC Standards) Set

4 Component ISTD Formulations

M-GRA-K4-SET — **Set**

Set includes:	Units
M-GRA-CAL-R-IS-R-SET	5 x 1 mL
M-GRA-ADD-IS-R	1 x 1 mL
M-GRA-QC-R-IS-R-5ML	1 x 5 mL
M-GRA-IS-R-10ML	1 x 10 mL
M-GRA-ST	1 x 1 mL

ASTM D5769 Benzene, Toluene & Total Aromatics

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

Special QA/QC Formulations

Daily QC Standard
Without Internal Standard

M-GRA-QC-R-10ML — **1 x 10 mL**
M-GRA-QC-R-10ML-PAK *SAVE* — **5 x 10 mL**
At stated Wt.% — 15 comps.

n-Hexane	12	Ethylbenzene	3
n-Heptane	17	*m*-Xylene	3
n-Octane	17	*o*-Xylene	3
n-Decane	12	1,2,4-Trimethylbenzene	3
n-Dodecane	5	1,2,4,5-Tetramethylbenzene	1
Isooctane	12	Pentamethylbenzene	1
Benzene	1	1-Methylnaphthalene	1
Toluene	9		

For use with any M-GRA Calibration Curve

Daily QC Standard
With Internal Standard M-GRA-IS-R

M-GRA-QCR-IS-R-5ML — **1 x 5 mL**
M-GRA-QCR-IS-R-5ML-PAK *SAVE* — **5 x 5 mL**
At stated Wt.% — 19 comps.

n-Hexane	12	Ethylbenzene	3
n-Heptane	17	*m*-Xylene	3
n-Octane	17	*o*-Xylene	3
n-Decane	12	1,2,4-Trimethylbenzene	3
n-Dodecane	5	1,2,4,5-Tetramethylbenzene	1
Isooctane	12	Pentamethylbenzene	1
Benzene	1	1-Methylnaphthalene	1
Toluene	9		

Includes M-GRA-IS-R (4 comp.) combined with the above Core Mix (15 comp.) in a 12 to 100 weight ratio.

Deuterated Internal Standard

M-GRA-IS-R-10ML — **1 x 10 mL**
M-GRA-IS-R-10ML-PAK *SAVE* — **5 x 10 mL**
At stated Wt.% — 4 comps.

Benzene-d_6	16.67
Ethylbenzene-d_{10}	16.65
Naphthalene-d_8	8.77
Toluene-d_8	57.91

Deuterated Internal Standard

M-GRA-IS-5ML — **1 x 5 mL**
M-GRA-IS-5ML-PAK *SAVE* — **5 x 5 mL**
At stated Wt.% — 3 comps.

Benzene-d_6	40	Naphthalene-d_8	20
Ethylbenzene-d_{10}	40		

ASTM D5769 Additional Internal, Deuterated and Quality Control Standards

Deuterated Internal Standard

ASTM-P-0140-IS — **1 x 10 mL**
ASTM-P-0140-IS-PAK *SAVE* — **5 x 10 mL**
At stated Wt.% — 4 comps.

Benzene-d_6	2	Naphthalene-d_8	1
Ethylbenzene-d_{10}	2	Isooctane	balance

Performance Evaluation Standard

ASTM-P-0140-PES — **1 x 1 mL**
ASTM-P-0140-PES-PAK *SAVE* — **5 x 1 mL**
At stated Wt.% — 11 comps.

Benzene	1
1,2-Diethylbenzene	0.005
1,3,5-Trimethylbenzene	1
1-Methyl-2-ethylbenzene	1
Styrene	0.1
Indene	0.1
Biphenyl	0.1
1,2,4,5-Tetramethylbenzene	1
1,2,3,5-Tetramethylbenzene	1
Hexadecane	1
Isooctane:Toluene (50:50)	balance

Deuterated Internal Standard

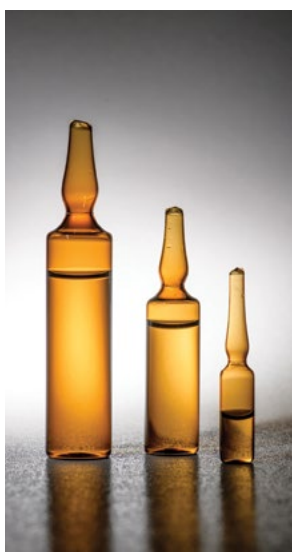
ASTM-P-0140-IS2 — **1 x 10 mL**
ASTM-P-0140-IS2-PAK *SAVE* — **5 x 10 mL**
At stated Wt.% — 5 comps.

Benzene-d_6	2	Toluene-d_8	7
Ethylbenzene-d_{10}	2	Isooctane	balance
Naphthalene-d_8	1		

Composition of Daily QC Standard

ASTM-P-0140-QC — **1 x 10 mL**
ASTM-P-0140-QC-PAK *SAVE* — **5 x 10 mL**
At stated Wt.% — 9 comps.

Benzene	1
Toluene	10
Ethylbenzene	3
1,3-Dimethylbenzene	6
1,2-Dimethylbenzene	3
1,2,4-Trimethylbenzene	3
1,2-Diethylbenzene	0.02
Naphthalene	1
Isooctane	balance



AccuStandard®

125 Market Street
New Haven, CT 06513 USA

www.AccuStandard.com