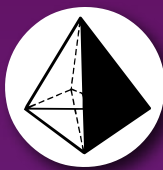


Explosive Standards



AccuStandard®

Explosive standards are traditionally used for the remediation of soil and water in locations where explosives have been stored. These same standards are being used to calibrate baggage screening detectors at airports and other secure locations (embassies and other government buildings). They also are used by police departments, government agencies (i.e. TSA, Homeland Security) and the military in K-9 odor recognition training for explosives. Recent advances in analytical instrumentation have demonstrated detection in the part per trillion range.¹

AccuStandard has working relationships with both government and private sector K-9 training facilities and laboratories that provide valuable information and insight into the latest developments in explosives.

To assist in all aspects of explosive detection and analysis, we synthesize an array of explosives as well as metabolites, degradation products, and raw materials. AccuStandard is the only U.S. commercial source for TATP, HMTD, and HNS. On-going work in this area has resulted in the recent addition of 3,3,6,6-Tetramethyl-1,2,4,5-tetraoxane (Diacetone diperoxide (DADP)) to our list.

In addition to catalog items we offer special formulations for EPA method and customer-specific applications.

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Widest Selection of Explosives and associated Metabolites

Synthesis Department

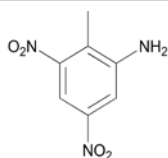
In response to customer requirements, AccuStandard has developed procedures to synthesize explosives and metabolites.



Bomb detection dogs are imprinted and trained to detect various types of explosives using pharmaceutical-type tins. Holes are drilled into the top of the tin to provide an odor cone for each explosive. The dog is repeatedly subjected to each odor and is rewarded when it properly alerts to it. Through this positive reinforcement process, the dog "learns" the odors associated with each explosive.

Individual Explosive Standards

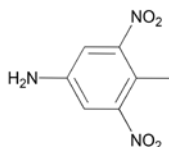
2-Amino-4,6-dinitrotoluene ♦



CAS 35572-78-2 MF C₇H₇N₃O₄ MW 197.15
log Pow 2.2 SG 1.50 g/cm³ MP 174-175 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-13-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-13	1 mL

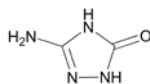
4-Amino-2,6-dinitrotoluene ♦



CAS 19406-51-0 MF C₇H₇N₃O₄ MW 197.15
log Pow 2.2 SG 1.50 g/cm³ MP 171 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-14-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-14	1 mL

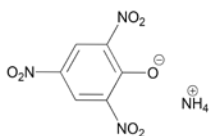
3-Amino-1,2,4-triazol-5-one ♦



CAS N/A MF C₂H₃N₃O MW 100.08 log Pow N/A
SG N/A MP 188-189 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN:MeOH (70:30)	M-8330-ADD-55	1 mL

Ammonium picrate



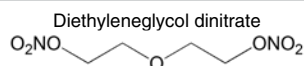
CAS 131-74-8 MF C₆H₆N₄O₇ MW 246.13
log Pow -1.4 SG N/A MP 265-271 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-27	1 mL

Property Key

CAS	Chemical Abstract Service Number
MF	Molecular Formula
MW	Molecular Weight
log Pow	Partition Coefficient
SG	Specific Gravity (g/cm ³)
MP	Melting Point (°C)

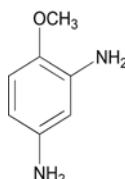
DEGDN



CAS 693-21-0 MF C₄H₈N₂O₇ MW 196.12
log Pow 0.98 SG 1.41 g/cm³ MP N/A

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-36	1 mL

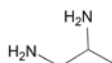
2,4-Diaminoanisole



CAS 615-05-4 MF C₇H₁₀N₂O MW 138.17
log Pow N/A SG N/A MP 67-68 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-58-CN	1 mL

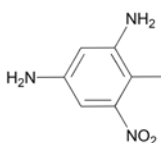
1,2-Diaminopropane



CAS 78-90-0 MF C₃H₁₀N₂ MW 74.12
log Pow -1.20 SG 0.86 g/cm³ MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-9	1 mL

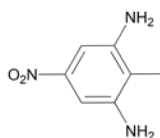
2,4-Diamino-6-nitrotoluene ♦



CAS 6629-29-4 MF C₇H₉N₃O₂ MW 167.17
log Pow -2.23 SG 1.40 g/cm³ MP 211 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-12	1 mL

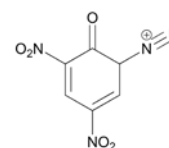
2,6-Diamino-4-nitrotoluene ♦



CAS 59229-75-3 MF C₇H₉N₃O₂ MW 167.17
log Pow -2.23 SG 1.40 g/cm³ MP 219 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-13	1 mL

Diazodinitrophenol



CAS 4682-03-5 MF C₆H₂N₄O₅ MW 210.10
log Pow 2.09 SG N/A MP 152-154 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-48	1 mL
1000 µg/mL in AcCN	M-8330-ADD-48-10X	1 mL

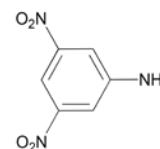
2,3-Dimethyl-2,3-dinitrobutane (DMNB)



CAS 3964-18-9 MF C₆H₁₂N₂O₄ MW 176.17
log Pow -0.24 SG 1.15 g/cm³ MP 214-215 °C (dec)

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-21	1 mL

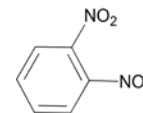
3,5-Dinitroaniline



CAS 618-87-1 MF C₆H₅N₃O₄ MW 183.12
log Pow 1.89 SG 1.59 g/cm³ MP 162 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-4	1 mL

1,2-Dinitrobenzene



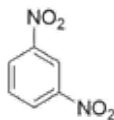
CAS 528-29-0 MF C₆H₄N₂O₄ MW 168.11
log Pow 1.69 SG 1.49 g/cm³ MP 118 °C

Matrix	Cat. No.	Unit
1000 µg/mL in MeOH	M-8330-SS	1 mL

♦ TNT Metabolites

Individual Explosive Standards

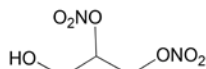
1,3-Dinitrobenzene



CAS 99-65-0 MF C₆H₄N₂O₄ MW 168.11
log Pow 1.49 SG 1.49 g/cm³ MP 89-90 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-01-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-01	1 mL

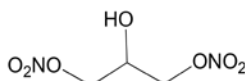
1,2-Dinitroglycerin



CAS 621-65-8 MF C₃H₆N₂O₇ MW 182.09
log Pow 0.83 SG 1.59 g/cm³ MP N/A

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-33	1 mL

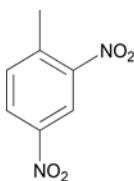
1,3-Dinitroglycerin



CAS 623-87-0 MF C₃H₆N₂O₇ MW 182.09
log Pow 0.71 SG 1.59 g/cm³ MP 26 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-34	1 mL

2,4-Dinitrotoluene ♦



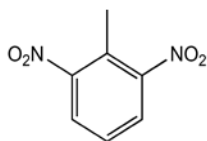
CAS 121-14-2 MF C₇H₆N₂O₄ MW 182.13
log Pow 1.98 SG 1.41 g/cm³ MP 71 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-02-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-02	1 mL

Property Key

CAS	Chemical Abstract Service Number
MF	Molecular Formula
MW	Molecular Weight
log Pow	Partition Coefficient
SG	Specific Gravity (g/cm ³)
MP	Melting Point (°C)

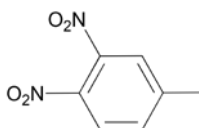
2,6-Dinitrotoluene ♦



CAS 606-20-2 MF C₇H₆N₂O₄ MW 182.13
log Pow 2.10 SG 1.41 g/cm³ MP 66 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-03-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-03	1 mL

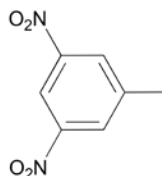
3,4-Dinitrotoluene



CAS 610-39-9 MF C₇H₆N₂O₄ MW 182.13
log Pow 2.08 SG 1.41 g/cm³ MP 58 °C

Matrix	Cat. No.	Unit
1000 µg/mL in MeOH	M-8330-IS	1 mL
	M-8330-IS-PAK	5 x 1 mL

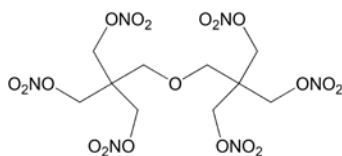
3,5-Dinitrotoluene ♦



CAS 618-85-9 MF C₇H₆N₂O₄ MW 182.13
log Pow 2.18 SG 1.41 g/cm³ MP 93 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN:MeOH	M-8330-ADD-39	1 mL

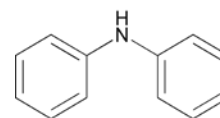
Dipentaerythritol hexanitrate



CAS 13184-80-0 MF C₁₀H₁₆N₆O₁₉ MW 524.26
log Pow 1.23 SG 1.66 g/cm³ MP 75 °C

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-43	1 mL

Diphenylamine

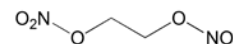


CAS 122-39-4 MF C₁₂H₁₁N MW 169.22
log Pow 3.50 SG 1.09 g/cm³ MP 52-54 °C

Matrix	Cat. No.	Unit
1000 µg/mL in Ethanol	ALR-041S-ET-10X	1 mL

EGDN

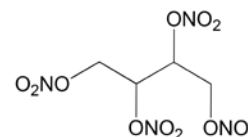
Dinitroethylene glycol



CAS 628-96-6 MF C₂H₄N₂O₆ MW 152.06
log Pow 1.16 SG 1.52 g/cm³ MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in AcCN:MeOH (95:5)	M-8330-ADD-5	1 mL

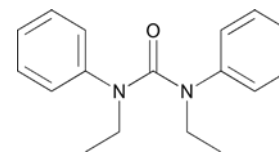
Erythritol tetranitrate (ETN)



CAS 7297-25-8 MF C₄H₆N₄O₁₂ MW 302.11
log Pow 1.85 SG 1.76 g/cm³ MP 61 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-47	1 mL
1000 µg/mL in AcCN	M-8330-ADD-47-10X	1 mL

Ethylcentralite



CAS 85-98-3 MF C₁₇H₂₀N₂O MW 268.35
log Pow 4.20 SG 1.12 g/cm³ MP 79 °C

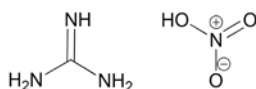
Matrix	Ratio 50:50	Cat. No.	Unit
1000 µg/mL in AcCN:MeOH		M-8330-ADD-50	1 mL

Synthesis Department

In response to customer requirements, AccuStandard has developed procedures to synthesize explosives and metabolites.

Individual Explosive Standards

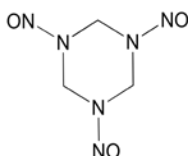
Guanidine nitrate



CAS 506-93-4 MF $\text{CH}_5\text{N}_3 \cdot \text{HNO}_3$ MW 122.08
log Pow -8.35 SG N/A MP 213-214 °C

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-10	1 mL

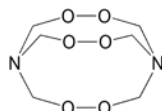
Hexahydro-1,3,5-trinitroso-1,3,5-triazine



CAS 13980-04-6 MF $\text{C}_3\text{H}_6\text{N}_6\text{O}_3$ MW 174.12
log Pow -1.78 SG 1.92 g/cm³ MP 106-107 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-46	1 mL
1000 µg/mL in AcCN	M-8330-ADD-46-10X	1 mL

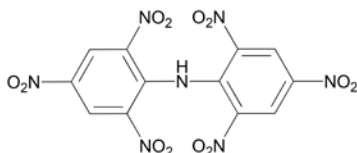
Hexamethylene triperoxide diamine (HMTD)



CAS 283-66-9 MF $\text{C}_6\text{H}_{12}\text{N}_2\text{O}_6$ MW 208.17
log Pow 1.01 SG 1.47 g/cm³ MP 162-164 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-25	1 mL

Hexanitrodiphenylamine

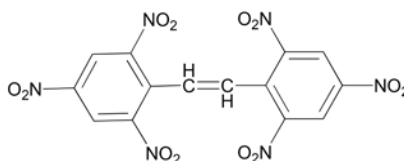


CAS 131-73-7 MF $\text{C}_{12}\text{H}_5\text{N}_7\text{O}_{12}$ MW 439.21
log Pow 3.35 SG 1.94 g/cm³ MP 244 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-37	1 mL

♦ TNT Metabolites

Hexanitrostilbene (HNS) ♦

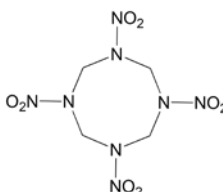


CAS 20062-22-0 MF $\text{C}_{14}\text{H}_6\text{N}_6\text{O}_{12}$ MW 450.23
log Pow 1.23 SG 1.85 g/cm³ MP 320 °C (dec)

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-26	1 mL

HMX

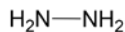
Cyclotetramethylene-tetranitramine



CAS 2691-41-0 MF $\text{C}_4\text{H}_8\text{N}_8\text{O}_8$ MW 296.16
log Pow 0.16 SG 1.95 g/cm³ MP 275 °C (dec)

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-04-0.1X	1 mL
1000 µg/mL in AcCN: MeOH		M-8330-04	1 mL

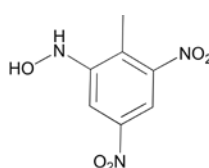
Hydrazine



CAS 302-01-2 MF H_4N_2 MW 32.05 log Pow -2.07
SG 1.01 g/cm³ MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-8	1 mL

2-Hydroxylamino-4,6-dinitrotoluene ♦



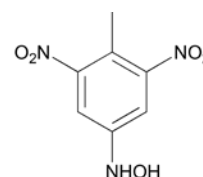
(3 months stability)

CAS 59283-76-0 MF $\text{C}_7\text{H}_7\text{N}_3\text{O}_5$ MW 213.15
log Pow 1.79 SG 1.64 g/cm³ MP 142-143 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-18*	1 mL

* To delay premature breakdown of thermally labile products in transit a ColdPAK is required.

4-Hydroxylamino-2,6-dinitrotoluene ♦

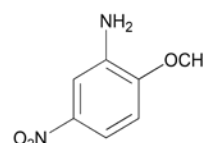


(3 months stability)

CAS 59283-75-9 MF $\text{C}_7\text{H}_7\text{N}_3\text{O}_5$ MW 213.15
log Pow 1.79 SG 1.64 g/cm³ MP 142-143 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-20*	1 mL

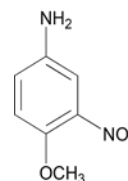
2-Methoxy-5-nitroaniline



CAS 99-59-2 MF $\text{C}_7\text{H}_8\text{N}_2\text{O}_3$ MW 168.15
log Pow 1.16 SG 0.99 g/cm³ MP 117-119 °C

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-56	1 mL

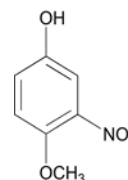
4-Methoxy-3-nitroaniline



CAS 577-72-0 MF $\text{C}_7\text{H}_8\text{N}_2\text{O}_3$ MW 168.15
log Pow N/A SG N/A MP 97 °C

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-57	1 mL

4-Methoxy-3-nitrophenol

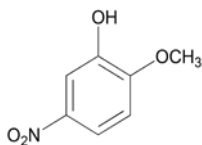


CAS 15174-02-4 MF $\text{C}_7\text{H}_7\text{NO}_4$ MW 169.14
log Pow N/A SG N/A MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-59	1 mL

Individual Explosive Standards

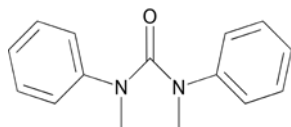
2-Methoxy-5-nitrophenol



CAS 636-93-1 MF $C_7H_7NO_4$ MW 169.14
log Pow 1.88 SG N/A MP 103-107 °C

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-60	1 mL

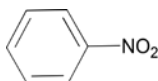
Methylcentralite



CAS 611-92-7 MF $C_{15}H_{16}N_2O$ MW 240.30
log Pow 3.22 SG 1.16 g/cm³ MP 122 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-49	1 mL

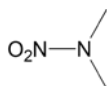
Nitrobenzene ♦



CAS 98-95-3 MF $C_6H_5NO_2$ MW 123.11
log Pow 1.85 SG 1.22 g/cm³ MP N/A

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-06-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-06	1 mL

N-Nitrodimethylamine



CAS 4164-28-7 MF $C_2H_6N_2O_2$ MW 90.08
log Pow -0.52 SG 1.10 g/cm³ MP 58 °C

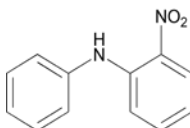
Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-40	1 mL

Property Key

CAS	Chemical Abstract Service Number
MF	Molecular Formula
MW	Molecular Weight
log Pow	Partition Coefficient
SG	Specific Gravity (g/cm ³)
MP	Melting Point (°C)

♦ TNT Metabolites

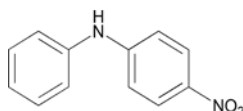
2-Nitrodiphenylamine



CAS 119-75-5 MF $C_{12}H_{10}N_2O_2$ MW 214.22
log Pow 3.66 SG 1.28 g/cm³ MP 74-76 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-51	1 mL

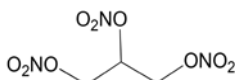
4-Nitrodiphenylamine



CAS 836-30-6 MF $C_{12}H_{10}N_2O_2$ MW 214.22
log Pow 3.74 SG 1.28 g/cm³ MP 132-136 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-52	1 mL

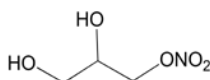
Nitroglycerin



CAS 55-63-0 MF $C_3H_5N_3O_9$ MW 227.09
log Pow 1.62 SG 1.67 g/cm³ MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in ETOH	M-8330-ADD-1	1 mL
1000 µg/mL in ETOH:MeOH(97:3)	M-8330-ADD-1-10X	1 mL

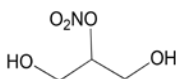
1-Nitroglycerin



CAS 624-43-1 MF $C_3H_7NO_5$ MW 137.09
log Pow -0.86 SG 1.48 g/cm³ MP 61 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-31	1 mL

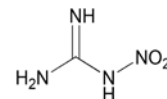
2-Nitroglycerin



CAS 620-12-2 MF $C_3H_7NO_5$ MW 137.09
log Pow -0.86 SG 1.48 g/cm³ MP 54 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-32	1 mL

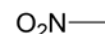
Nitroguanidine



CAS 556-88-7 MF $CH_4N_4O_2$ MW 104.07
log Pow -0.89 SG 2.01 g/cm³ MP 239 °C (dec)

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-6	1 mL

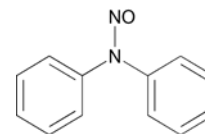
Nitromethane



CAS 75-52-5 MF CH_3NO_2 MW 61.04
log Pow -0.35 SG 1.06 g/cm³ MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-7	1 mL

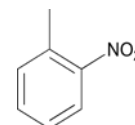
N-Nitrosodiphenylamine



CAS 86-30-6 MF $C_{12}H_{10}N_2O$ MW 198.22
log Pow 3.16 SG 1.23 g/cm³ MP 66-67 °C

Matrix	Cat. No.	Unit
100 µg/mL in DCM	APP-9-150	1 mL
1000 µg/mL in MeOH	APP-9-150-M-10X	1 mL

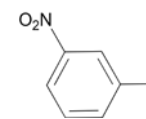
2-Nitrotoluene ♦



CAS 88-72-2 MF $C_7H_7NO_3$ MW 137.14
log Pow 2.30 SG 1.17 g/cm³ MP N/A

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-07-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-07	1 mL

3-Nitrotoluene ♦

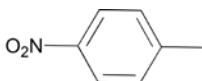


CAS 99-08-1 MF $C_7H_7NO_3$ MW 137.14
log Pow 2.45 SG 1.16 g/cm³ MP N/A

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-08-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-08	1 mL

Individual Explosive Standards

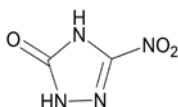
4-Nitrotoluene ♦



CAS 99-99-0 MF C₇H₇NO₃ MW 137.14
log Pow 2.37 SG 1.39 g/cm³ MP 51-54 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-09-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-09	1 mL

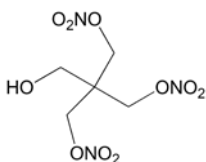
3-Nitro-1,2,4-triazol-5-one (NTO)



CAS 932-64-9 MF C₂H₂O₃N₄ MW 130.10
log Pow -2.72 SG 2.55 g/cm³ MP 265-268 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN:MeOH	M-8330-ADD-53	1 mL

Pentaerithryl trinitrate

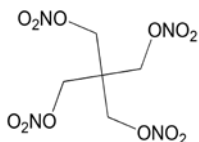


CAS 1607-17-6 MF C₅H₉N₃O₁₀ MW 271.14
log Pow 0.99 MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-44	1 mL

PETN

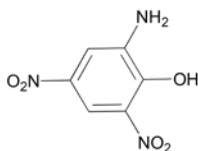
Pentaerythritol tetranitrate



CAS 78-11-5 MF C₅H₈N₄O₁₂ MW 316.14
log Pow 2.38 SG 1.68 g/cm³ MP 140 °C

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-2	1 mL
1000 µg/mL in MeOH	M-8330-ADD-2-10X	1 mL

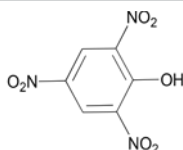
Picramic acid



CAS 96-91-3 MF C₆H₅N₃O₅ MW 199.12
log Pow 0.93 SG N/A MP 169 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-22	1 mL

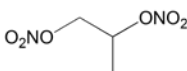
Picric acid



CAS 88-89-1 MF C₆H₃N₃O₇ MW 229.10
log Pow 1.44 SG 1.86 g/cm³ MP 122-123 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-3	1 mL

Propyleneglycol dinitrate

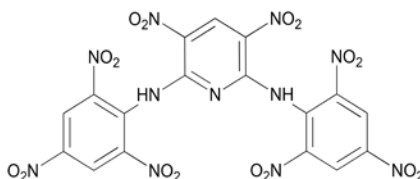


CAS 6423-43-4 MF C₃H₆N₂O₆ MW 166.09
log Pow 1.59 SG 1.42 g/cm³ MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-35	1 mL

PYX

2-6-bis,bis(Picrylamino)-3,5-dinitropyridine



CAS 38082-89-2 MF C₁₇H₇N₁₁O₁₆ MW 621.30
log Pow N/A SG 2.01 g/cm³ MP N/A

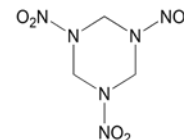
Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-11	1 mL

Synthesis Department

In response to customer requirements, AccuStandard has developed procedures to synthesize explosives and metabolites.

RDX

Cyclotrimethylene-trinitramine

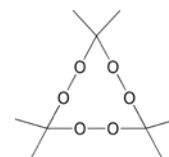


CAS 121-82-4 MF C₃H₆N₆O₆ MW 222.12
log Pow 0.87 SG 1.90 g/cm³ MP 205-208 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-05-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-05	1 mL

TATP

Triacetone triperoxide

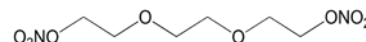


CAS 17088-37-8 MF C₉H₁₈O₆ MW 222.24
log Pow 4.63 SG 1.00 g/cm³ MP 94-96 °C

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-24 *	1 mL

TEGDN

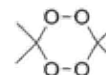
Triethyleneglycol dinitrate



CAS 111-22-8 MF C₆H₁₂N₂O₈ MW 240.17
log Pow 0.62 SG 1.34 g/cm³ MP N/A

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-41-R1	1 mL

3,3,6,6-Tetramethyl-1,2,4,5-tetraoxane (DADP)



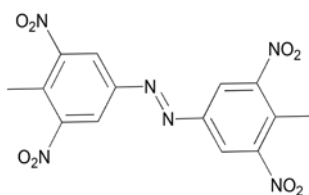
CAS 1073-91-2 MF C₆H₁₂O₄ MW 148.16
log Pow N/A SG 1.18 g/cm³ MP 110-113 °C (dec)

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-16-0.1X	1 mL
1000 µg/mL in AcCN	M-8330-16	1 mL

* To delay premature breakdown of thermally labile products in transit a ColdPAK is required.

Individual Explosive Standards

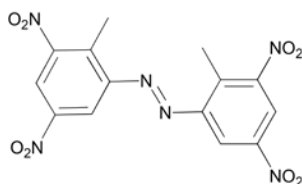
2,2',6,6'-Tetranitro-4,4'-azotoluene ♦



CAS N/A MF C₁₄H₁₀N₆O₈ MW 390.26
log Pow N/A SG N/A MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-17	1 mL

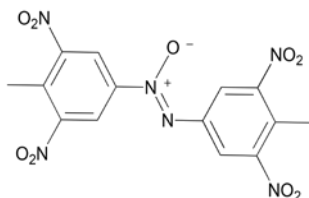
4,4',6,6'-Tetranitro-2,2'-azotoluene ♦



CAS N/A MF C₁₄H₁₀N₆O₈ MW 390.26
log Pow N/A SG N/A MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-19	1 mL

2,2',6,6'-Tetranitro-4,4'-azoxytoluene ♦

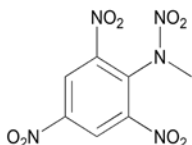


CAS N/A MF C₁₄H₁₀N₆O₉ MW 406.26
log Pow N/A SG N/A MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in AcCN	M-8330-ADD-15	1 mL

Tetryl

N-Methyl-N,2,4,6-tetranitroaniline

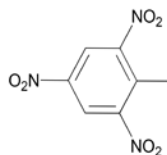


CAS 479-45-8 MF C₇H₅N₅O₈ MW 287.14
log Pow 1.64 SG 1.80 g/cm³ MP 130 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-10-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-10	1 mL

TNT

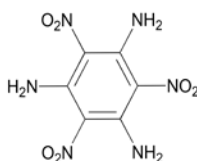
Trinitrotoluene



CAS 118-96-7 MF C₇H₅N₃O₆ MW 227.13
log Pow 1.6 SG 1.61 g/cm³ MP 81 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-11-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-11	1 mL

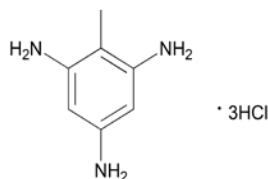
1,3,5-Triamino-2,4,6-trinitrobenzene



CAS 3058-38-6 MF C₆H₆N₆O₆ MW 258.15
log Pow -2.93 SG 1.96 g/cm³ MP 278 °C

Matrix	Cat. No.	Unit
40 µg/mL in DMF	M-8330-ADD-14-DMF	1 mL

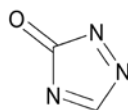
2,4,6-Triaminotoluene trihydrochloride (TNT free)



CAS 634-87-7 MF C₇H₁₁N₃ • 3HCl MW 246.56
log Pow -0.76 SG 1.22 g/cm³ MP 109-110 °C

Matrix	Cat. No.	Unit
NEAT	M-8330-ADD-23N-5MG	5 mg

1,2,4-Triazol-5-one

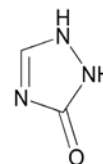


CAS 42131-33-9 MF C₂H₂N₃O MW 83.05
log Pow N/A SG N/A MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-61	1 mL

♦ TNT Metabolites

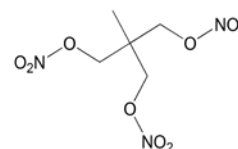
1,2,4-Triazol-3-one



CAS 930-33-6 MF C₂H₃N₃O MW 85.07
log Pow N/A SG N/A MP N/A

Matrix	Cat. No.	Unit
100 µg/mL in MeOH	M-8330-ADD-62	1 mL

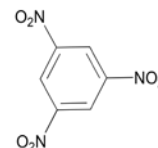
Trimethylolethane trinitrate



CAS 3032-55-1 MF C₉H₉N₃O₉ MW 255.14
log Pow 2.46 SG 1.51 g/cm³ MP N/A

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-ADD-28	1 mL

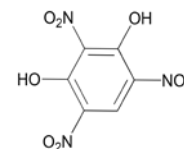
1,3,5-Trinitrobenzene ♦



CAS 99-35-4 MF C₆H₃N₃O₆ MW 213.10
log Pow 1.18 SG 1.70 g/cm³ MP 122 °C

Matrix	Ratio 50:50	Cat. No.	Unit
100 µg/mL in AcCN:MeOH		M-8330-12-0.1X	1 mL
1000 µg/mL in AcCN:MeOH		M-8330-12	1 mL

2,4,6-Trinitroresorcinol



CAS 82-71-3 MF C₆H₃N₃O₈ MW 245.10
log Pow 1.06 SG 2.01 g/cm³ MP 175-176 °C

Matrix	Ratio 50:50	Cat. No.	Unit
1000 µg/mL in AcCN:MeOH		M-8330-ADD-29	1 mL

Explosive Methods

Method 8330 Multi-Component Formulations for Explosive Analysis

The following A and B mixes provide better resolution between possible coeluting analytes to better optimize the HPLC system. We suggest when first performing Method 8330 development, to purchase the high concentration 14 x 1 mL set "M-8330-R-10X-SET"

Mix A

M-8330A *	1 x 1 mL
0.1 mg/mL each in AcCN:MeOH (50:50)	7 comps.
M-8330A-10X *	1 x 1 mL
1.0 mg/mL each in AcCN:MeOH (50:50)	7 comps.
1,3-Dinitrobenzene	RDX
2,4-Dinitrotoluene	1,3,5-Trinitrobenzene
HMX	TNT
Nitrobenzene	

M-8330A-R *	1 x 1 mL
0.1 mg/mL each in AcCN:MeOH (50:50)	8 comps.
M-8330A-R-10X *	1 x 1 mL
1.0 mg/mL each in AcCN:MeOH (50:50)	8 comps.
2-Amino-4,6-dinitrotoluene	Nitrobenzene
1,3-Dinitrobenzene	RDX
2,4-Dinitrotoluene	1,3,5-Trinitrobenzene
HMX	TNT

Composite Explosive Mixture

M-8330-R-0.1X	1 x 1 mL
0.1 mg/mL each in AcCN:MeOH (50:50)	14 comps.
M-8330-R-0.5X	1 x 1 mL
0.5 mg/mL each in AcCN:MeOH (50:50)	14 comps.
1,3-Dinitrobenzene	3-Nitrotoluene
2,4-Dinitrotoluene	4-Nitrotoluene
2,6-Dinitrotoluene	Tetryl
HMX	TNT
RDX	1,3,5-Trinitrobenzene
Nitrobenzene	2-Amino-4,6-dinitrotoluene
2-Nitrotoluene	4-Amino-2,6-dinitrotoluene

Internal Standard

M-8330-IS	1 x 1 mL
M-8330-IS-PAK	SAVE 5 x 1 mL
1.0 mg/mL in MeOH	
3,4-Dinitrotoluene	

Explosives by HPLC Set

M-8330-R-SET	14 x 1 mL
Each at 100 µg/mL in AcCN:MeOH (50:50)	
M-8330-R-10X-SET *	14 x 1 mL
Each at 1000 µg/mL in AcCN:MeOH (50:50)	
1,3-Dinitrobenzene (01)	3-Nitrotoluene (08)
2,4-Dinitrotoluene (02)	4-Nitrotoluene (09)
2,6-Dinitrotoluene (03)	Tetryl (10)
HMX (04)	TNT (11)
RDX (05)	1,3,5-Trinitrobenzene (12)
Nitrobenzene (06)	2-Amino-4,6-dinitrotoluene (13)
2-Nitrotoluene (07)	4-Amino-2,6-dinitrotoluene (14)

* To delay premature breakdown of thermally labile products in transit a ColdPAK is required.

Mix B

M-8330B *	1 x 1 mL
0.1 mg/mL each in AcCN:MeOH (50:50)	5 comps.
M-8330B-10X *	1 x 1 mL
1.0 mg/mL each in AcCN:MeOH (50:50)	5 comps.
Tetryl	3-Nitrotoluene
2,6-Dinitrotoluene	4-Nitrotoluene
2-Nitrotoluene	

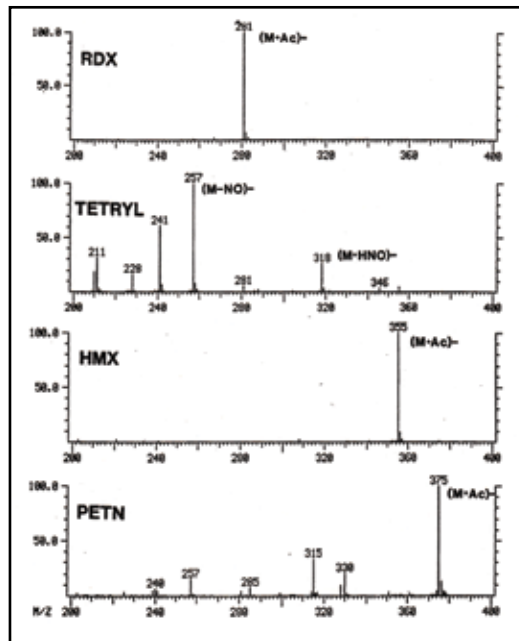
M-8330B-R	1 x 1 mL
0.1 mg/mL each in AcCN:MeOH (50:50)	7 comps.
M-8330B-R-10X *	1 x 1 mL
1.0 mg/mL each in AcCN:MeOH (50:50)	7 comps.
2-Amino-4,6-dinitrotoluene	2-Nitrotoluene
4-Amino-2,6-dinitrotoluene	3-Nitrotoluene
Tetryl	4-Nitrotoluene
2,6-Dinitrotoluene	

M-8330B-R2	1 x 1 mL
0.1 mg/mL each in AcCN:MeOH (50:50)	6 comps.

M-8330B-R2-10X *	1 x 1 mL
1.0 mg/mL each in AcCN:MeOH (50:50)	6 comps.
4-Amino-2,6-dinitrotoluene	2-Nitrotoluene
Tetryl	3-Nitrotoluene
2,6-Dinitrotoluene	4-Nitrotoluene

Surrogate Standard

M-8330-SS	1 x 1 mL
1.0 mg/mL in MeOH	
1,2-Dinitrobenzene	



Negative ion thermospray mass spectra for RDX, HMX, PETN and tetryl from Berberich, D.W., Yost, R.A., and Fetterhoff, D.D., J. Forensic Sci., 33, 946, 1988.

Explosive Methods

Method 529 Explosive & Related Compounds by SPE & Capillary Column GC/MS

Method 529 Calibration Curve

All in µg/mL in Ethyl acetate

M-529-	01	02	03	04	05	06	07	08	09
2-Amino-4,6-dinitrotoluene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
4-Amino-2,6-dinitrotoluene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
3,5-Dinitroaniline	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
1,3-Dinitrobenzene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
2,4-Dinitrotoluene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
2,6-Dinitrotoluene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
RDX	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
Nitrobenzene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
2-Nitrotoluene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
3-Nitrotoluene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
4-Nitrotoluene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
1,3,5-Trinitrobenzene	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
Tetryl	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10
TNT	0.025	0.05	0.10	0.25	0.50	1.0	2.0	5.0	10

Full Scan MS Calibration Set

M-529-MS-SET 6 x 1 mL
M-529-03, M-529-05, M-529-06,
M-529-07, M-529-08, M-529-09

SIM Calibration Set

M-529-SIM-SET 7 x 1 mL
M-529-01, M-529-02, M-529-03, M-529-04,
M-529-05, M-529-06, M-529-07

Storage Condition.: Freeze (<-10°C)

Internal Standard Stock Solution

M-529-IS 1 x 1 mL
2.0 mg/mL Ethyl acetate
3,4-Dinitrotoluene

Surrogate Analyte Stock Solutions

M-529-SS1 1 x 1 mL
M-529-SS1-PAK SAVE 5 x 1 mL
1000 µg/mL each in MeOH 2 comps.
1,3,5-Trimethyl-2-nitrobenzene 1,2,4-Trimethyl-5-nitrobenzene

Internal Standard Fortification Solution

M-529-ISFS 1 x 1 mL
200 µg/mL each in Ethyl acetate:AcCN (96:4) 14 comps.

2-Amino-4,6-dinitrotoluene	Nitrobenzene
4-Amino-2,6-dinitrotoluene	2-Nitrotoluene
3,5-Dinitroaniline	3-Nitrotoluene
1,3-Dinitrobenzene	4-Nitrotoluene
2,4-Dinitrotoluene	1,3,5-Trinitrobenzene
2,6-Dinitrotoluene	Tetryl
RDX	TNT

M-529-SS2 1 x 1 mL
M-529-SS2-PAK SAVE 5 x 1 mL
1000 µg/mL each in CH₂Cl₂
Nitrobenzene-d₅

Surrogate Analyte Fortification Solution

M-529-SAFS 1 x 1 mL
100 µg/mL each in MeOH 3 comps.
1,3,5-Trimethyl-2-nitrobenzene Nitrobenzene-d₅
1,2,4-Trimethyl-5-nitrobenzene

Method 8095 Explosives by GC/ECD

This method is a companion to EPA Method 8330, utilizing the sensitivity and selectivity of the ECD.

Explosive Stock Solution A

M-8095-SSA-100X 1 x 1 mL
M-8095-SSA-100X-PAK SAVE 5 x 1 mL
100 µg/mL each in AcCN:MeOH (50:50) 10 comps.

2-Amino-4,6-dinitrotoluene	1,3,5-Trinitrobenzene
4-Amino-2,6-dinitrotoluene	TNT
1,3-Dinitrobenzene	RDX
2,6-Dinitrotoluene	Tetryl
2,4-Dinitrotoluene	HMX

Explosive Stock Solution B

M-8095-SSB-100X 1 x 1 mL
M-8095-SSB-100X-PAK SAVE 5 x 1 mL
At stated conc. in AcCN:MeOH (50:50) 7 comps.

Nitrobenzene (500 µg/mL)	Nitroglycerin (500 µg/mL)
3-Nitrotoluene (500 µg/mL)	PETN (500 µg/mL)
2-Nitrotoluene (500 µg/mL)	3,5-Dinitroaniline (100 µg/mL)
4-Nitrotoluene (500 µg/mL)	

Explosive Surrogate Standards

M-8095-SS-01 1 x 1 mL
M-8095-SS-01-PAK SAVE 5 x 1 mL
100 µg/mL in AcCN
3,4-Dinitrotoluene

M-8095-SS-03 1 x 1 mL
M-8095-SS-03-PAK SAVE 5 x 1 mL
100 µg/mL in AcCN
2,5-Dinitrotoluene

M-8095-SS-02 1 x 1 mL
M-8095-SS-02-PAK SAVE 5 x 1 mL
100 µg/mL in AcCN
2-Methyl-4-nitroaniline

Explosive Standards

DIN Explosive Standards

DIN 38407-21 Explosives

Examination of water, wastewater, and sludge for determination of selected explosives and related compounds by HPLC with UV detection.

DIN38407-21-A

10 µg/mL each in MeOH

Compound	Conc.	Matrix	Cat. No.
Picric acid	10 µg/mL	MeOH	ICP-02N-1
HMX	10 µg/mL	MeOH	ICP-02N-5
RDX	10 µg/mL	MeOH	ICP-02N-1
Tetryl	10 µg/mL	MeOH	ICP-02N-5
EGDN	10 µg/mL	MeOH	ICP-02N-1
DEGDN	10 µg/mL	MeOH	ICP-02N-5
Nitroglycerin	10 µg/mL	MeOH	ICP-02N-1
TNT	10 µg/mL	MeOH	ICP-02N-5

1 x 1 mL

12 comps.

DIN 38407-21 Related Compounds

Examination of water, wastewater, and sludge for determination of selected explosives and related compounds by HPLC with UV detection.

DIN38407-21-B

10 µg/mL each in MeOH:AcCN (98:2)

Compound	Conc.	Matrix	Cat. No.
1,3,5-Trinitrobenzene	10 µg/mL	MeOH:AcCN (98:2)	ICP-02N-1
1,3-Dinitrobenzene	10 µg/mL	MeOH:AcCN (98:2)	ICP-02N-5
4-Amino-2,6-dinitrotoluene	10 µg/mL	MeOH:AcCN (98:2)	ICP-02N-1
2,2',4,4',6,6'-Hexanitrodiphenylamine	10 µg/mL	MeOH:AcCN (98:2)	ICP-02N-5
2-Amino-4,6-dinitrotoluene	10 µg/mL	MeOH:AcCN (98:2)	ICP-02N-1
2,6-Dinitrotoluene	10 µg/mL	MeOH:AcCN (98:2)	ICP-02N-5
2,4-Dinitrotoluene	10 µg/mL	MeOH:AcCN (98:2)	ICP-02N-1
Diphenylamine	10 µg/mL	MeOH:AcCN (98:2)	ICP-02N-5

1 x 1 mL

8 comps.

Gun Surveillance Standards

Gun Surveillance Standard

EXP-GSS

At stated conc. (µg/mL) in AcCN

1 x 1 mL

9 comps.

Compound	Conc.	Matrix	Cat. No.
Dimethyl phthalate	200 µg/mL	AcCN	ICP-02N-1
2,4'-Dinitrodiphenylamine	50 µg/mL	AcCN	ICP-02N-5
2,4-Dinitrodiphenylamine	50 µg/mL	AcCN	ICP-02N-1
2-Nitrodiphenylamine	50 µg/mL	AcCN	ICP-02N-5
4-Nitrodiphenylamine	50 µg/mL	AcCN	ICP-02N-1
2,2'-Dinitrodiphenylamine	50 µg/mL	AcCN	ICP-02N-5
4,4'-Dinitrodiphenylamine	50 µg/mL	AcCN	ICP-02N-1
Diphenylamine	200 µg/mL	AcCN	ICP-02N-5
N-Nitrosodiphenylamine	75 µg/mL	AcCN	ICP-02N-1



Photo courtesy of the Connecticut Department of Emergency Services and Public Protection

Inorganic Standards for Gunshot Residue

Element	Starting Material	Unit	1000 µg/mL Cat. No.	10,000 µg/mL Cat. No.
Antimony		50 mL	ICP-02N-1	ICP-02N-10X-0.5
	Sb 2-5% HNO ₃ tr.	100 mL	ICP-02N-5	ICP-02N-10X-5
	Tartaric acid	500 mL	ICP-02N-5	ICP-02N-10X-5
Barium		50 mL	ICP-04N-1	ICP-04N-10X-0.5
	Ba(NO ₃) ₂	100 mL	ICP-04N-5	ICP-04N-10X-1
	2-5% Nitric acid	500 mL	ICP-04N-5	ICP-04N-10X-5
Lead		50 mL	ICP-29N-1	ICP-29N-10X-0.5
	Pb(NO ₃) ₂	100 mL	ICP-29N-5	ICP-29N-10X-1
	2-5% Nitric acid	500 mL	ICP-29N-5	ICP-29N-10X-5

Technical Note

Gunshot residue standards may be used for ICP, ICP-MS & SEM/EDAX analysis. Organic compounds identified in the discharge of a firearm include the 14 organic compounds listed below. Contact our Technical Department for additional information, including custom solutions.

Organic Compounds for Firearm Discharge Analysis

Compound	Conc.	Matrix	Cat. No. (1 mL)	Compound	Conc.	Matrix	Cat. No. (1 mL)
2,4-Dinitrotoluene	100 µg/mL	AcCN:MeOH	M-8330-02-0.1X	4-Nitrodiphenylamine	100 µg/mL	AcCN	M-8330-ADD-52
C ₇ H ₆ N ₂ O ₄	1000 µg/mL	AcCN:MeOH	M-8330-02	C ₁₂ H ₁₀ N ₂ O ₂			
2,6-Dinitrotoluene	100 µg/mL	AcCN:MeOH	M-8330-03-0.1X	1-Nitroglycerine	100 µg/mL	AcCN:MeOH	M-8330-ADD-31
C ₇ H ₆ N ₂ O ₄	1000 µg/mL	AcCN:MeOH	M-8330-03	C ₃ H ₅ N ₃ O ₉			
3,4-Dinitrotoluene	1000 µg/mL	AcCN:MeOH	M-8330-IS	2-Nitroglycerine	100 µg/mL	AcCN:MeOH	M-8330-ADD-32
C ₇ H ₆ N ₂ O ₄				C ₃ H ₅ N ₃ O ₉			
Diphenylamine	100 µg/mL	DCM	APP-9-097	N-Nitrosodiphenylamine	100 µg/mL	DCM	APP-9-150
C ₁₂ H ₁₁ N				C ₁₂ H ₁₀ N ₂ O			
Ethylcentralite	100 µg/mL	AcCN:MeOH	M-8330-ADD-50	2-Nitrotoluene	1000 µg/mL	AcCN:MeOH	M-8330-07
C ₁₇ H ₂₀ N ₂ O				C ₇ H ₇ NO ₃			
Methylcentralite	100 µg/mL	AcCN:MeOH	M-8330-ADD-49	3-Nitrotoluene	1000 µg/mL	AcCN:MeOH	M-8330-08
C ₁₅ H ₁₆ N ₂ O				C ₇ H ₇ NO ₃			
2-Nitrodiphenylamine	100 µg/mL	AcCN	M-8330-ADD-51	4-Nitrotoluene	1000 µg/mL	AcCN:MeOH	M-8330-09
C ₁₂ H ₁₀ N ₂ O ₂				C ₇ H ₇ NO ₃			

See pages 1-6 for structures and physical data.



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