

# Explosives

The ability to detect the presence of explosives from a distance of a few millimeters to several meters serves several different purposes, such as:

- Training dogs and other animals to detect bombs & landmines
- Automated Explosive Detection Systems at airports to electronically “sniff” baggage and people to detect bombs
- Analysis to aid the remediation of contaminated soil and water at ordnance sites

AccuStandard synthesizes the important explosives and their metabolites, raw materials & degradates and makes them available in usable forms to:

- Government Agencies such as The Transportation Security Administration (TSA) formerly the FAA, has the responsibility for safety of air travel and embassies, a concern shared by all nations. The FBI uses the reference standards to confirm the presence of particular compounds when screening objects and people.
- Instrument Manufacturers’ instruments that are used in airports and embassies require documented reference materials to maintain their performance in generating reliable data.
- Research Facilities where there is a need for constant development of procedures and reference standards to combat new terrorist threats.
- Monitoring Labs for remediation of contaminated soil and water from the storage and use of explosives at ordnance sites has been ongoing for the last thirty years. The US EPA developed its own method, Method 8330, to define the procedure that is used globally.

AccuStandard is a leading company in the Explosive Standards area offering about sixty explosives, degradates and metabolites (most synthesized in-house) in addition to the many special formulations for customer-specific applications and EPA method-specific formulations. AccuStandard is the only commercial source for TATP, HNS, and HMTD due to the excellent work of its Synthesis Department. If there is an explosive standard that you require that is not listed, please contact AccuStandard’s Technical Service Department for a quotation.

Explosive Standards are listed as follows:

- Single Solutions
- International Methods
- USEPA Mixtures



## Explosives (in 1 mL of solvent, unless otherwise noted)

COMPOUND	CAS NO.	QTY./CONC.	MATRIX	CAT. NO.
2-Amino-4,6-dinitrotoluene	35572-78-2	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-13-0.1X M-8330-13
4-Amino-2,6-dinitrotoluene	19406-51-0	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-14-0.1X M-8330-14
Ammonium picrate		0.1 mg/mL	AcCN	M-8330-ADD-27 ‡
1,2-Diaminopropane	78-90-0	0.1 mg/mL	MeOH	M-8330-ADD-9
1,2-Dinitrobenzene	528-29-0	1 mg/mL	MeOH	M-8330-SS
1,3-Dinitrobenzene	99-65-0	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-01-0.1X M-8330-01
2,3-Dimethyl-2,3-dinitrobutane	3964-18-9	100 µg/mL	AcCN	M-8330-ADD-21
2,4-Diamino-6-nitrotoluene	6629-29-4	0.1 mg/mL	AcCN	M-8330-ADD-12
2,4-Dinitrotoluene	121-14-2	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-02-0.1X M-8330-02
2,6-Diamino-4-nitrotoluene	59229-75-3	0.1 mg/mL	AcCN	M-8330-ADD-13
2,5-Dinitrotoluene	619-15-8	100 µg/mL	AcCN	M-8095-SS-03
2,6-Dinitrotoluene	606-20-2	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-03-0.1X M-8330-03
3,4-Dinitrotoluene	610-39-9	100 µg/mL 1 mg/mL	AcCN MeOH	M-8095-SS-01 M-8330-IS
EGDN	628-96-6	0.1 mg/mL	AcCN	M-8330-ADD-5
Guanidine nitrate	506-93-7	0.1 mg/mL	MeOH	M-8330-ADD-10
Hexanitrostilbene (HNS)		0.1 mg/mL	AcCN	M-8330-ADD-26
HMX	2691-41-0	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-04-0.1X M-8330-04
HMTD		0.1 mg/mL	AcCN	M-8330-ADD-25 ‡
2-Hydroxylamino-4,6-dinitrotoluene		0.1 mg/mL	AcCN	M-8330-ADD-18 ‡
4-Hydroxylamino-2,6-dinitrotoluene		0.1 mg/mL	AcCN	M-8330-ADD-20 ‡
Hydrazine	302-01-2	0.1 mg/mL	MeOH	M-8330-ADD-8
Nitrobenzene	98-95-3	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-06-0.1X M-8330-06
Nitroglycerin	55-63-0	0.1 mg/mL	EtOH	M-8330-ADD-1
Nitroguanidine	556-88-7	0.1 mg/mL	MeOH	M-8330-ADD-6
Nitromethane	75-52-5	0.1 mg/mL	MeOH	M-8330-ADD-7
2-Nitrotoluene	88-72-2	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-07-0.1X M-8330-07
3-Nitrotoluene	99-08-1	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-08-0.1X M-8330-08
4-Nitrotoluene	99-99-0	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-09-0.1X M-8330-09
PETN	78-11-5	0.1 mg/mL	MeOH	M-8330-ADD-2
Picramic acid	831-52-7	100 µg/mL	AcCN:MeOH	M-8330-ADD-22
Picric acid	88-89-1	0.1 mg/mL	AcCN:MeOH	M-8330-ADD-3
Propyleneglycol dinitrate		0.1 mg/mL	MeOH	M-8330-ADD-35 ‡
PYX	38082-89-2	0.1 mg/mL	AcCN	M-8330-ADD-11
RDX	121-82-4	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-05-0.1X M-8330-05
TATP		0.1 mg/mL	AcCN	M-8330-ADD-24 ‡
Tetryl	479-45-8	0.1 mg/mL 1 mg/mL	MeOH:AcCN (1:1) MeOH:AcCN (1:1)	M-8330-10-0.1X M-8330-10
2,2',6,6'-Tetranitro-4,4'-azoytoluene		0.1 mg/mL	AcCN	M-8330-ADD-15

‡ To delay premature breakdown of thermally labile products in transit we suggest shipping with a “Cold Pack”

# Explosives

Explosives (in 1 mL of solvent, unless otherwise noted)

COMPOUND	CAS NO.	QTY./CONC.	MATRIX	CAT. NO.
2,2',6,6'-Tetranitro-4,4'-azotoluene		0.1 mg/mL	AcCN	M-8330-ADD-17
4,4',6,6'-Tetranitro-2,2'-azotoluene		0.1 mg/mL	AcCN	M-8330-ADD-19
TNT	118-96-7	0.1 mg/mL	MeOH:AcCN (1:1)	M-8330-11-0.1X
		1 mg/mL	MeOH:AcCN (1:1)	M-8330-11
1,3,5-Trinitrobenzene	99-35-4	0.1 mg/mL	MeOH:AcCN (1:1)	M-8330-12-0.1X
		1 mg/mL	MeOH:AcCN (1:1)	M-8330-12
		100 µg/mL	MeOH	APP-9-210
		2 mg/mL	MeOH	M-8270-10
1,3,5-Triamino-2,4,6-trinitrobenzene		mg/mL	Dimethylformamide	M-8330-ADD-14-DMF
2,4,6-Triaminotoluene trihydrochloride	634-87-7	10 mg	Neat	M-8330-ADD-23N
Trimethylolethane trinitrate		100 µg/mL	AcCN:MeOH	M-8330-ADD-28

## Explosives by HPLC Set

### M-8330-R-SET

Each at 0.1 mg/mL in MeOH:AcCN (1:1)

set of 14 x 1 mL

### M-8330-R-10X-SET ‡

Each at 1.0 mg/mL in MeOH:AcCN (1:1)

set of 14 x 1 mL

1,3-Dinitrobenzene (01)	Nitrobenzene (06)	TNT (11)
2,4-Dinitrotoluene (02)	2-Nitrotoluene (07)	1,3,5-Trinitrobenzene (12)
2,6-Dinitrotoluene (03)	3-Nitrotoluene (08)	2-Amino-4,6-dinitrotoluene (13)
HMX (04)	4-Nitrotoluene (09)	4-Amino-2,6-dinitrotoluene (14)
RDX (05)	Tetryl (10)	

‡ To delay premature breakdown of thermally labile products in transit we suggest shipping with a "Cold Pack"

## Synthesis Department

We developed the procedures & synthesized these Explosives and Metabolites in response to customer requirements.

Individual Explosives

## EU Formulations

### DIN 38407-21 Explosives

Scope: 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

1 x 1 mL

12 comps.

Picric acid  
HMX  
RDX  
Tetryl  
EGDN  
DEGDN  
Nitroglycerin  
TNT  
2-Nitrotoluene  
PETN  
4-Nitrotoluene  
3-Nitrotoluene

### DIN-38407-17 Nitroaromatic Compounds

Scope: Examination of water, wastewater, and sludge for the determination of selected nitroaromatic compounds by Gas-Liquid Chromatography

#### DIN38407-17

500 µg/mL each in MeOH

1 x 1 mL

12 comps.

Nitrobenzene  
2-Nitrotoluene  
4-Nitrotoluene  
1,3-Dinitrobenzene  
2,6-Dinitrotoluene  
2,4-Dinitrotoluene  
3,4-Dinitrotoluene  
2-Amino-6-nitrotoluene  
4-Amino-2-nitrotoluene  
4-Amino-2,6-dinitrotoluene  
2-Amino-4,6-dinitrotoluene  
2,4,6-Trinitrotoluene

### DIN 38407-21 Related Compounds

Scope: 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)

1 x 1 mL

8 comps.

1,3,5-Trinitrobenzene  
1,3-Dinitrobenzene  
4-Amino-2,6-dinitrotoluene  
2,2',4,4',6,6'-Hexanitrodiphenylamine  
2-Amino-4,6-dinitrotoluene  
2,6-Dinitrotoluene  
2,4-Dinitrotoluene  
Diphenylamine

If you do not find the mixture you need, please inquire at your local Distributor for a very competitive prices.

# Explosives

## Multi-Component Formulations for Method 8330 Explosive Analysis

The following A & B mixes provide better resolution between possible coeluting analytes. Depending on the way the chemist optimizes the HPLC system, the chemist can choose which A & B mix is finally used. We suggest, when first performing Method 8330 development, to purchase the high concentration 14 x 1 mL set "M-8330R-SET-10X".

**M-8330A ‡** 1 x 1 mL  
0.1 mg/mL each in AcCN:MeOH (1:1) 7 comps.

**M-8330A-10X ‡** 1 x 1 mL  
1.0 mg/mL each in AcCN:MeOH (1:1) 7 comps.

1,3-Dinitrobenzene  
2,4-Dinitrotoluene  
HMX  
Nitrobenzene  
RDX  
1,3,5-Trinitrobenzene  
TNT

**M-8330A-R ‡** 1 x 1 mL  
0.1 mg/mL each in AcCN:MeOH (1:1) 8 comps.

**M-8330A-R-10X ‡** 1 x 1 mL  
1.0 mg/mL each in AcCN:MeOH (1:1) 8 comps.

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

### Composite Explosive Mixture

**M-8330-R** 1 x 1 mL  
**M-8330-R-PAK** 5 x 1 mL  
1.0 mg/mL each in MeOH:AcCN (1:1) 14 comps.

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

**M-8330B ‡** 1 x 1 mL  
0.1 mg/mL each in AcCN:MeOH (1:1) 5 comps.

**M-8330B-10X ‡** 1 x 1 mL  
1.0 mg/mL each in AcCN:MeOH (1:1) 5 comps.

Tetryl  
2,6-Dinitrotoluene  
2-Nitrotoluene  
3-Nitrotoluene  
4-Nitrotoluene

**1M-8330B-R ‡** 1 x 1 mL  
0.1 mg/mL each in AcCN:MeOH (1:1) 7 comps.

**M-8330B-R-10X ‡** 1 x 1 mL  
1.0 mg/mL each in AcCN:MeOH (1:1) 7 comps.

2-Amino-4,6-dinitrotoluene  
4-Amino-2,6-dinitrotoluene  
Tetryl  
2,6-Dinitrotoluene  
2-Nitrotoluene  
3-Nitrotoluene  
4-Nitrotoluene

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

**M-8330B-R2-10X ‡** 1 x 1 mL  
1.0 mg/mL each in AcCN:MeOH (1:1) 6 comps.

4-Amino-2,6-dinitrotoluene  
Tetryl  
2,6-Dinitrotoluene  
2-Nitrotoluene  
3-Nitrotoluene  
4-Nitrotoluene

### Internal Standard

**M-8330-IS** 1 x 1 mL  
**M-8330-IS-PAK** **SAVE 20%** 5 x 1 mL  
1.0 mg/mL in MeOH

3,4-Dinitrotoluene

### Surrogate Standard

**M-8330-SS** 1 x 1 mL  
1.0 mg/mL in MeOH

1,2-Dinitrobenzene

## Explosive Intermediate for EPA Method 8095 by GC/ECD

This set of standards for EPA Method 8095 is outlined below. This method is a companion to EPA Method 8330. Utilizing the sensitivity and selectivity of the ECD as well as resolution capabilities of capillary columns allows the chemist to quantitatively analyze for the typical explosives. Use of this new method expands the laboratory's capability to pursue and fulfill contracts involving explosives analysis. The method uses familiar extraction techniques which reduce sample preparation time. It also has the benefit of GC/ECD instrument reproducibility.

### Stock Solution A

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

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

### Explosive Surrogate Standards

**M-8095-SS-01** 1 x 1 mL  
**M-8095-SS-01-PAK** 5 x 1 mL  
100 µg/mL in AcCN

3,4-Dinitrotoluene

**M-8095-SS-02** 1 x 1 mL  
**M-8095-SS-02-PAK** 5 x 1 mL  
100 µg/mL in AcCN

2-Methyl-4-nitroaniline

**M-8095-SS-03** 1 x 1 mL  
**M-8095-SS-03-PAK** 5 x 1 mL  
10 µg/mL in AcCN

2,5-Dinitrotoluene

### Technical Note

The following A & B mixes to provide better resolution between possible coeluting analytes. Depending on the way the chemist optimizes the HPLC system, the chemist can choose which A & B mix is finally used. We suggest, when first performing Method 8330 development to purchase the high concentration 14 x 1 mL set "M-8330-R-SET-10X".

### Stock Solution B

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

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

‡ To delay premature breakdown of thermally labile products in transit we suggest shipping with a "Cold Pack"

118-96-7:125	100X-PAK:126	15:124	M-8330A-R:126
121-14-2:124	M-8270-10:125	M-8330-ADD-	M-8330A-R-
121-82-4:124	M-8330-01:124	17:125	10X:126
19406-51-0:124	M-8330-01-	M-8330-ADD-	M-8330B:126
2691-41-0:124	0.1X:124	18:124	M-8330B-
302-01-2:124	M-8330-02:124	M-8330-ADD-	10X:126
35572-78-2:124	M-8330-02-	19:125	M-8330B-R:126
38082-89-2:124	0.1X:124	M-8330-ADD-	M-8330B-R-
3964-18-9:124	M-8330-03:124	2:124	10X:126
479-45-8:124	M-8330-03-	M-8330-ADD-	M-8330B-R2:126
506-93-7:124	0.1X:124	20:124	M-8330B-R2-
528-29-0:124	M-8330-04:124	M-8330-ADD-	10X:126
55-63-0:124	M-8330-04-	21:124	
556-88-7:124	0.1X:124	M-8330-ADD-	
59229-75-3:124	M-8330-05:124	22:124	
606-20-2:124	M-8330-05-	M-8330-ADD-	
610-39-9:124	0.1X:124	23N:125	
619-15-8:124	M-8330-06:124	M-8330-ADD-	
628-96-6:124	M-8330-06-	24:124	
634-87-7:125	0.1X:124	M-8330-ADD-	
6629-29-4:124	M-8330-07:124	25:124	
75-52-5:124	M-8330-07-	M-8330-ADD-	
78-11-5:124	0.1X:124	26:124	
78-90-0:124	M-8330-08:124	M-8330-ADD-	
831-52-7:124	M-8330-08-	27:124	
88-72-2:124	0.1X:124	M-8330-ADD-	
88-89-1:124	M-8330-09:124	28:125	
98-95-3:124	M-8330-09-	M-8330-ADD-	
99-08-1:124	0.1X:124	3:124	
99-35-4:125	M-8330-10:124	M-8330-ADD-	
99-65-0:124	M-8330-10-	35:124	
99-99-0:124	0.1X:124	M-8330-ADD-	
APP-9-210:125	M-8330-11:125	5:124	
DIN38407-17:125	M-8330-11-	M-8330-ADD-	
DIN38407-21-	0.1X:125	6:124	
A:125	M-8330-12:125	M-8330-ADD-	
DIN38407-21-	M-8330-12-	7:124	
B:125	0.1X:125	M-8330-ADD-	
M-8095-SS-	M-8330-13:124	8:124	
01:124, 126	M-8330-13-	M-8330-ADD-	
M-8095-SS-01-	0.1X:124	9:124	
PAK:126	M-8330-14:124	M-8330-IS:124,	
M-8095-SS-	M-8330-14-	126	
02:126	0.1X:124	M-8330-IS-	
M-8095-SS-02-	M-8330-ADD-	PAK:126	
PAK:126	1:124	M-8330-R:126	
M-8095-SS-	M-8330-ADD-	M-8330-R-	
03:124, 126	10:124	PAK:126	
M-8095-SS-03-	M-8330-ADD-	M-8330-R-	
PAK:126	11:124	SET:125	
M-8095-SSA-	M-8330-ADD-	M-8330-R-SET-	
100X:126	12:124	10X:125	
M-8095-SSA-	M-8330-ADD-	M-8330-SS:124,	
100X-PAK:126	13:124	126	
M-8095-SSB-	M-8330-ADD-14-	M-8330A:126	
100X:126	DMF:125	M-8330A-	
M-8095-SSB-	M-8330-ADD-	10X:126	