

Explosive Stock Solution A

Novachem Pty Ltd

Version No: 8.9

Safety Data Sheet according to Work Health and Safety Regulations (Hazardous Chemicals) 2023 and ADG requirements

Chemwatch Hazard Alert Code: 3

Initial Date: 04/09/2015

Revision Date: 30/04/2026

Print Date: 30/04/2026

S.GHS.AUS.EN

SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	Explosive Stock Solution A
Synonyms	M-8095-SSA-100X
Proper shipping name	FLAMMABLE LIQUID, N.O.S. (contains acetonitrile and methanol)
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Laboratory Chemical Reference Material
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Details of the manufacturer or importer of the safety data sheet

Registered company name	Novachem Pty Ltd	Novachem Pty Ltd
Address	25 Crissane Road, Heidelberg West Victoria 3081 Australia	25 Crissane Road, Heidelberg West Victoria 3081 Australia
Telephone	+61384151255	+61384151255
Fax	+61386250088	+61386250088
Website	www.novachem.com.au	www.novachem.com.au
Email	novachem@novachem.com.au	novachem@novachem.com.au

Emergency telephone number

Association / Organisation	Victorian Poisons Information Centre	Victorian Poisons Information Centre
Emergency telephone number(s)	13 11 26	13 11 26
Other emergency telephone number(s)	Not Available	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	Not Applicable
Classification ^[1]	Flammable Liquids Category 2, Acute Toxicity (Oral) Category 3, Acute Toxicity (Dermal) Category 3, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2A, Acute Toxicity (Inhalation) Category 3, Reproductive Toxicity Category 1B, Specific Target Organ Toxicity - Single Exposure Category 1, Specific Target Organ Toxicity - Repeated Exposure Category 2
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

Label elements

Hazard pictogram(s)	  
Signal word	Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H360D	May damage the unborn child.
H370	Causes damage to organs.
H373	May cause damage to organs through prolonged or repeated exposure.

Precautionary statement(s) Prevention

P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe mist/vapours/spray.
P264	Wash all exposed external body areas thoroughly after handling.

Precautionary statement(s) Response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider.
P308+P311	IF exposed or concerned: Call a POISON CENTER/doctor/physician/first aider.
P330	Rinse mouth.
P370+P378	In case of fire: Use alcohol resistant foam or normal protein foam to extinguish.

Precautionary statement(s) Storage

P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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No further product hazard information.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
75-05-8	49.95	acetonitrile
67-56-1	49.95	methanol
19406-51-0	0.01	4-Amino-2,6-dinitrotoluene
99-65-0	0.01	1,3-Dinitrobenzene in Methanol:Acetonitrile
606-20-2	0.01	2,6-dinitrotoluene
121-14-2	0.01	2,4-Dinitrotoluene
99-35-4	0.01	1,3,5-Trinitrobenzene
118-96-7	0.01	Trinitrotoluene (TNT)
121-82-4	0.01	cyclotrimethylenetrinitramine
479-45-8	0.01	tetryl
2691-41-0	0.01	HMX
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available	

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▶ Immediately hold eyelids apart and flush the eye continuously with running water. ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▶ Transport to hospital or doctor without delay. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: ▶ Quickly but gently, wipe material off skin with a dry, clean cloth. ▶ Immediately remove all contaminated clothing, including footwear. ▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. ▶ Transport to hospital, or doctor.
Inhalation	▶ If fumes or combustion products are inhaled remove from contaminated area. ▶ Lay patient down. Keep warm and rested. ▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

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	▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▶ Transport to hospital, or doctor, without delay.
Ingestion	▶ IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. ▶ For advice, contact a Poisons Information Centre or a doctor. ▶ Urgent hospital treatment is likely to be needed. ▶ In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition. ▶ If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist. ▶ If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS. Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise: ▶ INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. NOTE: Wear a protective glove when inducing vomiting by mechanical means. ▶ If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

Indication of any immediate medical attention and special treatment needed

For acute and short term repeated exposures to methanol:

- Toxicity results from accumulation of formaldehyde/formic acid.
- Clinical signs are usually limited to CNS, eyes and GI tract. Severe metabolic acidosis may produce dyspnea and profound systemic effects which may become intractable. All symptomatic patients should have arterial pH measured. Evaluate airway, breathing and circulation.
- Stabilise obtunded patients by giving naloxone, glucose and thiamine.
- Decontaminate with Ipecac or lavage for patients presenting 2 hours post-ingestion. Charcoal does not absorb well; the usefulness of cathartic is not established.
- Forced diuresis is not effective; haemodialysis is recommended where peak methanol levels exceed 50 mg/dL (this correlates with serum bicarbonate levels below 18 mEq/L).
- Ethanol, maintained at levels between 100 and 150 mg/dL, inhibits formation of toxic metabolites and may be indicated when peak methanol levels exceed 20 mg/dL. An intravenous solution of ethanol in D5W is optimal.
- Folate, as leucovorin, may increase the oxidative removal of formic acid. 4-methylpyrazole may be an effective adjunct in the treatment. 8-Phenytoin may be preferable to diazepam for controlling seizure.

[Ellenhorn Barceloux: Medical Toxicology]

Methanol poisoning can be treated with fomepizole, or if unavailable, ethanol. Both drugs act to reduce the action of alcohol dehydrogenase on methanol by means of competitive inhibition. Ethanol, the active ingredient in alcoholic beverages, acts as a competitive inhibitor by more effectively binding and saturating the alcohol dehydrogenase enzyme in the liver, thus blocking the binding of methanol. Methanol is excreted by the kidneys without being converted into the very toxic metabolites formaldehyde and formic acid. Alcohol dehydrogenase instead enzymatically converts ethanol to acetaldehyde, a much less toxic organic molecule. Additional treatment may include sodium bicarbonate for metabolic acidosis, and hemodialysis or hemodiafiltration to remove methanol and formate from the blood. Folinic acid or folic acid is also administered to enhance the metabolism of formate.

BIOLOGICAL EXPOSURE INDEX - BEI

Determinant	Index	Sampling Time	Comment
1. Methanol in urine	15 mg/l	End of shift	B, NS
2. Formic acid in urine	80 mg/gm creatinine	Before the shift at end of workweek	B, NS

B: Background levels occur in specimens collected from subjects **NOT** exposed.

NS: Non-specific determinant - observed following exposure to other materials.

For cyanide intoxication (and for certain nitriles which produce cyanide ion)

- ▶ Signs symptoms of acute cyanide poisoning reflect cellular hypoxia and are often non-specific.
- ▶ Cyanosis may be a late finding.
- ▶ **A bradycardic**, hypertensive and tachypneic patient suggests poisoning especially if CNS and cardiovascular depression subsequently occurs.
- ▶ Immediate attention should be directed towards assisted ventilation, administration of 100% oxygen, insertion of intravenous lines and institution of cardiac monitoring.
- ▶ Obtain an arterial blood gas immediately and correct any severe metabolic acidosis (pH below 7.15).
- ▶ Mildly symptomatic patients generally require supportive care alone. Nitrites should not be given indiscriminately - in all cases of moderate to severe poisoning, they should be given in conjunction with thiosulfate. As a temporizing measure supply amyl nitrite perles (0.2ml inhaled 30 seconds every minute) until intravenous lines for sodium nitrite are established. 10 ml of a 3% solution is administered over 4 minutes to produce 20% methaemoglobin in adults. Follow directly with 50 ml of 25% sodium thiosulfate, at the same rate, IV. If symptoms reappear or persist within 1/2-1 hour, repeat nitrite and thiosulfate at 50% of initial dose. As the mode of action involves the metabolic conversion of the thiosulfate to thiocyanate, renal failure may enhance thiocyanate toxicity.
- ▶ Methylene blue is not an antidote. [Ellenhorn and Barceloux: Medical Toxicology]

If amyl nitrite intervention is employed then Medical Treatment Kits should contain the following:

- ▶ One box containing one dozen amyl nitrite ampoules
- ▶ Two sterile ampoules of sodium nitrite solution (10 mL of a 3% solution in each)
- ▶ Two sterile ampoules of sodium thiosulfate solution (50 mL of a 25% solution in each)
- ▶ One 10 mL sterile syringe. One 50 mL sterile syringe. Two sterile intravenous needles. One tourniquet.
- ▶ One dozen gauze pads.
- ▶ Latex gloves
- ▶ A 'Biohazard' bag for disposal of bloody/contaminated equipment.
- ▶ A set of cyanide instructions on first aid and medical treatment.

- Notes on the use of amyl nitrite:-

- ▶ AN is highly volatile and flammable - do not smoke or use around a source of ignition.
- ▶ If treating patient in a windy or draughty area provide some shelter or protection (shirt, wall, drum, cupped hand etc.) to prevent amyl nitrite vapour from being blown away. Keep ampoule upwind from the nose, the objective is to get amyl nitrite into the patient's lungs.
- ▶ Rescuers should avoid AN inhalation to avoid becoming dizzy and losing competence.
- ▶ Lay the patient down. Since AN dilates blood vessels and lowers blood pressure, lying down will help keep patient conscious.
- ▶ **DO NOT overuse - excessive use might put the patient into shock.** Experience at DuPont plants has not shown any serious after-effects from treatment with amyl nitrite.

ADDITIONAL NOTES:

- ▶ Major medical treatment procedures may vary e.g. US (FDA method as recommended by DuPont) uses amyl nitrite as a methaemoglobin generator, followed by treatment with sodium nitrite and then sodium thiosulfate.

MODES OF ACTION: Amyl nitrite (AN) reacts with haemoglobin (HB) to form about 5% methaemoglobin (MHB). Sodium nitrite (NaNO₂) reacts with haemoglobin to form approximately 20-30% methaemoglobin. Methaemoglobin attracts cyanide ions (CN⁻) from tissue and binds with them to become cyanmethaemoglobin (CNMHB). Sodium thiosulfate (Na₂S₂O₃) converts cyanmethaemoglobin to thiocyanate (HSCN) which is excreted by the kidneys. i.e. AN + HB = MHB NaNO₂ + HB = MHB CN + MHB = CNMHB Na₂S₂O₃ + CNMHB + O₂ = HSCN

- ▶ The administration of the antidote salts is intravenous in normal saline, Ringers lactate or other available IV fluid.
- ▶ European practice may use 4-dimethylaminophenol (DMAP) as a methaemoglobin generator. Also hydroxycobalamin (Vitamin B12a) is used. Hydroxycobalamin works by reacting with cyanide to form cyanocobalamin (Vitamin B12) which is excreted in the urine.
- ▶ European and Australian NOHSC (ASCC) propose dicobalt edetate (Kelocyanor) as antidote. This acts by chelating cyanide to form stable cobaltcyanide, which is excreted in the urine. In all cases hyperbaric therapy may increase the efficiency of a cyanide antidote kit.

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SECTION 5 Firefighting measures

Extinguishing media

Water may be an ineffective extinguishing media for methanol fires; static explosions are reported for aqueous solutions as dilute as 30%. Water may be used to cool containers.

- ▶ Foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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Advice for firefighters

Fire Fighting	▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ May be violently or explosively reactive. ▶ Wear full body protective clothing with breathing apparatus. ▶ Prevent, by any means available, spillage from entering drains or water course.
Fire/Explosion Hazard	Combustion products include: ▶ carbon dioxide (CO₂) ▶ Liquid and vapour are highly flammable. ▶ Severe fire hazard when exposed to heat, flame and/or oxidisers. ▶ Vapour forms an explosive mixture with air. ▶ Severe explosion hazard, in the form of vapour, when exposed to flame or spark. formaldehyde nitrogen oxides (NO _x) ▶ other pyrolysis products typical of burning organic material.
HAZCHEM	*3Y

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	Environmental hazard - contain spillage. ▶ Remove all ignition sources. ▶ Clean up all spills immediately. ▶ Avoid breathing vapours and contact with skin and eyes. ▶ Control personal contact with the substance, by using protective equipment.
Major Spills	Environmental hazard - contain spillage. ▶ DO NOT touch the spill material For alkyl nitriles: For residue: ▶ Add alkaline hypochlorite solution to spill to produce cyanate. ▶ Neutralise liquid, and absorb with sawdust. ▶ Collect solid residues and seal in drums for disposal. ▶ Wash spill area with large quantities of water. ▶ Clear area of personnel and move upwind. ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ May be violently or explosively reactive. ▶ Wear full body protective clothing with breathing apparatus.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	▶ Containers, even those that have been emptied, may contain explosive vapours. ▶ Do NOT cut, drill, grind, weld or perform similar operations on or near containers. ▶ Avoid skin contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area. ▶ Prevent concentration in hollows and sumps. ▶ DO NOT allow clothing wet with material to stay in contact with skin
Other information	▶ Store in original containers in approved flame-proof area. ▶ No smoking, naked lights, heat or ignition sources. ▶ DO NOT store in pits, depression, basement or areas where vapours may be trapped. ▶ Keep containers securely sealed.

Conditions for safe storage, including any incompatibilities

Suitable container	▶ Glass container is suitable for laboratory quantities ▶ Packing as supplied by manufacturer. ▶ Plastic containers may only be used if approved for flammable liquid. ▶ Check that containers are clearly labelled and free from leaks. ▶ For low viscosity materials (i) : Drums and jerry cans must be of the non-removable head type. (ii) : Where a can is to be used as an inner package, the can must have a screwed enclosure. ▶ For materials with a viscosity of at least 2680 cSt. (23 deg. C) ▶ For manufactured product having a viscosity of at least 250 cSt.
Storage incompatibility	Methanol:

Continued...

- ▶ reacts violently with strong oxidisers, acetyl bromide, alkyl aluminium salts, beryllium dihydride, bromine, chromic acid, 1-chloro-3,3-difluoro-2-methoxycyclopropene, cyanuric chloride, diethylzinc, isophthaloyl chloride, nitric acid, perchloric acid, potassium-tert-butoxide, potassium sulfur diimide, Raney nickel catalysts, 2,4,6-trichlorotriazine, triethylaluminium, 1,3,3-trifluoro-2-methoxycyclopropene
- ▶ is incompatible with strong acids, strong caustics, alkaline earth and alkali metals, aliphatic amines, acetaldehyde, benzoyl peroxide, 1,3-bis(di-n-cyclopentadienyl iron)-2-propen-1-one, calcium carbide, chloroform, chromic anhydride, chromium trioxide, dialkylzinc, dichlorine oxide, dichloromethane, ethylene oxide, hypochlorous acid, isocyanates, isopropyl chlorocarbonate, lithium tetrahydroaluminate, magnesium, methyl azide, nitrogen dioxide, palladium, pentafluoroguanidine, perchloryl fluoride, phosphorus pentasulfide, phosphorus trioxide, potassium, tangerine oil, triisobutylaluminium
- ▶ mixtures with lead perchlorate, sodium hypochlorite are explosive
- ▶ may react with metallic aluminium at high temperatures
- ▶ slowly corrodes lead and aluminium
- ▶ may generate electrostatic charges, due to low conductivity, on flow or agitation
- ▶ attacks some plastics, rubber and coatings.

Static induced flash fires have happened when filling plastic containers with methanol / water solutions with as low as 30% methanol content
Acetonitrile

- ▶ forms cyanide gas on contact with steam
- ▶ reacts violently with oxidisers such as chlorine, bromine, fluorine; with chlorosulfonic acid, oleum or sulfuric acid
- ▶ is incompatible with water (especially if acid or alkaline), acids, caustics, nitrating agents, indium, nitrogen tetroxide , sulfur trioxide, iron(III) salts of perchlorate, nitrogen fluoride compounds
- ▶ attacks most rubber and plastics
- ▶ may accumulate electrical charges, causing ignition of vapours
- ▶ Contact with acids produces toxic fumes
- ▶ Nitriles may polymerise in the presence of metals and some metal compounds.
- ▶ They are incompatible with acids; mixing nitriles with strong oxidising acids can lead to extremely violent reactions.
- ▶ Nitriles are generally incompatible with other oxidising agents such as peroxides and epoxides.
- ▶ The combination of bases and nitriles can produce hydrogen cyanide.
- ▶ The covalent cyano group is endothermic and many organic nitriles are reactive under certain conditions; N-cyano derivatives are reactive or unstable.
- ▶ The majority of endothermic compounds are thermodynamically unstable and may decompose explosively under various circumstances of initiation.
- ▶ Many but not all endothermic compounds have been involved in decompositions, reactions and explosions and, in general, compounds with significantly positive values of standard heats of formation, may be considered suspect on stability grounds.

BREITHERICK L.: Handbook of Reactive Chemical Hazards

WARNING:

May decompose violently or explosively on contact with other substances.

- ▶ This substance, or one of its components, is one of the relatively few compounds which are described as 'endothermic' i.e. heat is absorbed into the compound, rather than released from it, during its formation.
- ▶ The majority of endothermic compounds are thermodynamically unstable and may decompose explosively under various circumstances of initiation.
- ▶ Many but not all endothermic compounds have been involved in decompositions, reactions and explosions and, in general, compounds with significantly positive values of standard heats of formation, may be considered suspect on stability grounds.

Alcohols

- ▶ are incompatible with strong acids, acid chlorides, acid anhydrides, oxidising and reducing agents.
- ▶ reacts, possibly violently, with alkaline metals and alkaline earth metals to produce hydrogen
- ▶ react with strong acids, strong caustics, aliphatic amines, isocyanates, acetaldehyde, benzoyl peroxide, chromic acid, chromium oxide, dialkylzincs, dichlorine oxide, ethylene oxide, hypochlorous acid, isopropyl chlorocarbonate, lithium tetrahydroaluminate, nitrogen dioxide, pentafluoroguanidine, phosphorus halides, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutylaluminium
- ▶ should not be heated above 49 deg. C. when in contact with aluminium equipment
- ▶ Avoid storage with reducing agents.

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	acetonitrile	Acetonitrile	40 ppm / 67 mg/m3	101 mg/m3 / 60 ppm	Not Available	Not Available
Australia Workplace exposure limits for airborne contaminants (WEL list) (Effective from 1 December 2026) - Appendix A - Workplace Exposure Limits	acetonitrile	Acetonitrile	20 ppm / 34 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	methanol	Methyl alcohol	200 ppm / 262 mg/m3	328 mg/m3 / 250 ppm	Not Available	Not Available
Australia Workplace exposure limits for airborne contaminants (WEL list) (Effective from 1 December 2026) - Appendix A - Workplace Exposure Limits	methanol	Methyl alcohol	100 ppm / 130 mg/m3	Not Available	Not Available	The use, handling and storage of this chemical is subject to restriction or prohibition (see regulations 340, 380 - 384 and Schedule 10 to the model WHS Regulations).
Australia Exposure Standards	1,3-Dinitrobenzene in Methanol:Acetonitrile	m- Dinitrobenzene	0.15 ppm / 1 mg/m3	Not Available	Not Available	Not Available
Australia Workplace exposure limits for airborne contaminants (WEL list) (Effective from 1 December 2026) - Appendix A - Workplace Exposure Limits	1,3-Dinitrobenzene in Methanol:Acetonitrile	Dinitrobenzene (m-, o-, p- isomers)	0.15 ppm / 1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	Trinitrotoluene (TNT)	2,4,6-Trinitrotoluene (TNT)	0.5 mg/m3	Not Available	Not Available	Not Available
Australia Workplace exposure limits for airborne contaminants (WEL list) (Effective from 1	Trinitrotoluene (TNT)	2,4,6-Trinitrotoluene	0.1 mg/m3	Not Available	Not Available	Not Available

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
December 2026) - Appendix A - Workplace Exposure Limits						
Australia Exposure Standards	cyclotrimethylenetrinitramine	Cyclonite	1.5 mg/m3	Not Available	Not Available	Not Available
Australia Workplace exposure limits for airborne contaminants (WEL list) (Effective from 1 December 2026) - Appendix A - Workplace Exposure Limits	cyclotrimethylenetrinitramine	Cyclonite	0.1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	tetryl	Tetryl	1.5 mg/m3	Not Available	Not Available	Not Available
Australia Workplace exposure limits for airborne contaminants (WEL list) (Effective from 1 December 2026) - Appendix A - Workplace Exposure Limits	tetryl	Tetryl	1.5 mg/m3	Not Available	Not Available	Not Available

Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard 'physically' away from the worker and ventilation that strategically 'adds' and 'removes' air in the work environment.
Individual protection measures, such as personal protective equipment	
Eye and face protection	▶ Safety glasses with side shields. ▶ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent] ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.
Skin protection	See Hand protection below
Hands/feet protection	▶ Wear chemical protective gloves, e.g. PVC. ▶ Wear safety footwear or safety gumboots, e.g. Rubber The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice. Personal hygiene is a key element of effective hand care. for acetonitrile: Butyl rubber, PVAL, Teflon, Saranex, Silvershield, Viton/ chlorobutyl are all highly resistant to permeation
Body protection	See Other protection below
Other protection	▶ Overalls. ▶ PVC Apron. ▶ PVC protective suit may be required if exposure severe. ▶ Eyewash unit. ▶ Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity. ▶ For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets). ▶ Non sparking safety or conductive footwear should be considered. Conductive footwear describes a boot or shoe with a sole made from a conductive compound chemically bound to the bottom components, for permanent control to electrically ground the foot an shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the: **'Forsberg Clothing Performance Index'.**
The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:
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Material	CPI
BUTYL	A
BUTYL/NEOPRENE	A
PE/EVAL/PE	A
SARANEX-23	A
NEOPRENE	B
TEFLON	B
CPE	C
NAT+NEOPR+NITRILE	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
PVA	C
PVC	C

Respiratory protection

Type AX Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the 'Exposure Standard' (or ES), respiratory protection is required.
Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	AX-AUS	-	AX-PAPR-AUS / Class 1
up to 50 x ES	-	AX-AUS / Class 1	-
up to 100 x ES	-	AX-2	AX-PAPR-2 ^

^ - Full-face
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the

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PVDC/PE/PVDC	C
SARANEX-23 2-PLY	C
VITON/NEOPRENE	C

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as 'feel' or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.

- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Clear liquid	Relative density (Water = 1)	Not Available
Physical state	Liquid	Partition coefficient n-octanol / water	Not Available
Odour	Not Available	Auto-ignition temperature (°C)	Not Available
Odour threshold	Not Available	Decomposition temperature (°C)	Not Available
pH (as supplied)	Not Available	Viscosity (cSt)	Not Available
Melting point / freezing point (°C)	Not Available	Molecular weight (g/mol)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Taste	Not Available
Flash point (°C)	<23	Explosive properties	Not Available
Evaporation rate	Not Available BuAC = 1	Oxidising properties	Not Available
Flammability	HIGHLY FLAMMABLE.	Surface Tension (dyn/cm or mN/m)	Not Available
Upper Explosive Limit (%)	Not Available	Volatile Component (%vol)	>99.9
Lower Explosive Limit (%)	Not Available	Gas group	Not Available
Vapour pressure (kPa)	Not Available	pH as a solution (1%)	Not Available
Solubility in water	Miscible	VOC g/L	Not Available
Vapour density (Air = 1)	Not Available	Ignition Distance (cm)	Not Available
Heat of Combustion (kJ/g)	Not Available	Flame Duration (s)	Not Available
Flame Height (cm)	Not Available	Enclosed Space Ignition Deflagration Density (g/m3)	Not Available
Enclosed Space Ignition Time Equivalent (s/m3)	Not Available		

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	▶ Static induced flash fires have happened when filling plastic containers with methanol / water solutions with as low as 30% methanol content. ▶ Presence of elevated temperatures. ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

a) Acute Toxicity	There is sufficient evidence to classify this material as acutely toxic.
b) Skin Irritation/Corrosion	There is sufficient evidence to classify this material as skin corrosive or irritating.
c) Serious Eye Damage/Irritation	There is sufficient evidence to classify this material as eye damaging or irritating
d) Respiratory or Skin sensitisation	Based on available data, the classification criteria are not met.
e) Mutagenicity	Based on available data, the classification criteria are not met.
f) Carcinogenicity	Based on available data, the classification criteria are not met.
g) Reproductivity	There is sufficient evidence to classify this material as toxic to reproductivity

h) STOT - Single Exposure	There is sufficient evidence to classify this material as toxic to specific organs through single exposure
i) STOT - Repeated Exposure	There is sufficient evidence to classify this material as toxic to specific organs through repeated exposure
j) Aspiration Hazard	Based on available data, the classification criteria are not met.
Inhaled	Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects. The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of vapours, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo. Minor but regular methanol exposures may effect the central nervous system, optic nerves and retinae. Symptoms may be delayed, with headache, fatigue, nausea, blurring of vision and double vision. Continued or severe exposures may cause damage to optic nerves, which may become severe with permanent visual impairment even blindness resulting. WARNING: Methanol is only slowly eliminated from the body and should be regarded as a cumulative poison which cannot be made non-harmful [CCINFO] Changes to blood vessels and the presence of methaemoglobin in the blood contribute to the signs and symptoms characteristic of trinitrotoluene (TNT) poisoning. Exposure may cause sneezing, sore throat, headache, weakness, anaemia and liver injury. The smell of acetonitrile does not give enough warning of exposure. The gas is highly toxic, and inhaling it can cause loss of consciousness.
Ingestion	Severely toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 5 gram may be fatal or may produce serious damage to the health of the individual. Nitrile poisoning exhibits similar symptoms to poisoning due to hydrogen cyanide. The substances irritate the eyes and skin, and are absorbed quickly and completely through the skin. Methanol may produce a burning or painful sensation in the mouth, throat, chest, and stomach. This may be accompanied by nausea, vomiting, headache, dizziness, shortness of breath, weakness, fatigue, leg cramps, restlessness, confusion, drunken behaviour, visual disturbance, drowsiness, coma and death. 60-200 ml of methanol is a fatal dose for most adults with as little as 10 ml producing blindness. In massive overdose, liver, kidney, heart and muscle injury have been described. There is strong evidence to suggest that this material can cause, if swallowed once, very serious, irreversible damage of organs.
Skin Contact	Skin contact with the material may produce toxic effects; systemic effects may result following absorption. The material may accentuate any pre-existing dermatitis condition TNT is absorbed through intact skin. Ten percent of workers exposed by skin contact become ill. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. There is strong evidence to suggest that this material, on a single contact with skin, can cause serious, irreversible damage of organs. There is some evidence to suggest that the material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.
Eye	Methanol is a mild to moderate eye irritant. High vapor concentration or liquid contact with eyes causes irritation, tearing, and burning. Direct contact of the eye with ethanol may cause immediate stinging and burning with reflex closure of the lid and tearing, transient injury of the corneal epithelium and hyperaemia of the conjunctiva. There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe inflammation may be expected with pain.
Chronic	Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. Ample evidence exists, from results in experimentation, that developmental disorders are directly caused by human exposure to the material. Chronic exposure to cyanides and certain nitriles may result in interference to iodine uptake by thyroid gland and its consequent enlargement. This occurs following metabolic conversion of the cyanide moiety to thiocyanate. Exposure at work to trinitrotoluene (TNT) and its related substances has been associated with dermatitis, bluing of the extremities, inflammation of the stomach, acute yellow shrinkage of the liver and aplastic anaemia. Occasionally, there may be increased or decreased white cell count, varying degrees of central nervous system changes (probably as a result of low oxygen levels), inflammation of the peripheral nerves, muscle pains, irregularities in the heart, muscle and menstruation, and irritation of the kidneys and urinary system. Young adult men often present with a toxic hepatitis while older workers show a full-blown aplastic anaemia. A long-term survey at a munitions plant where TNT had been handled showed no cases of permanent liver damage, although symptoms of liver involvement occurred in some workers. Long-term exposure to methanol vapour, at concentrations exceeding 3000 ppm, may produce cumulative effects characterised by gastrointestinal disturbances (nausea, vomiting), headache, ringing in the ears, insomnia, trembling, unsteady gait, vertigo, conjunctivitis and clouded or double vision. Liver and/or kidney injury may also result.

Explosive Stock Solution A	TOXICITY	IRRITATION
	Not Available	Not Available
acetonitrile	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[1]	Eye (Rodent - rabbit): 100uL/24H - Moderate
	Inhalation(Rabbit) LC50; 2828 ppm4h ^[2]	Eye: adverse effect observed (irritating) ^[1]
	Oral (Rabbit) LD50; 50 mg/kg ^[2]	Skin (Rodent - rabbit): 500mg - Mild
		Skin: no adverse effect observed (not irritating) ^[1]
methanol	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 15800 mg/kg ^[2]	Eye (Rodent - rabbit): 0.1mL
	Inhalation (Rat) LC50: 64000 ppm4h ^[2]	Eye (Rodent - rabbit): 0.1mL - Severe
	Oral (Rat) LD50: 5628 mg/kg ^[2]	Eye (Rodent - rabbit): 100mg/24H - Moderate
		Eye (Rodent - rabbit): 40mg - Moderate
		Eye: no adverse effect observed (not irritating) ^[1]
		Skin (Rodent - rabbit): 20mg/24H - Moderate
		Skin: no adverse effect observed (not irritating) ^[1]

Explosive Stock Solution A

4-Amino-2,6-dinitrotoluene	TOXICITY		IRRITATION
	Oral (Rat) LD50: 959 mg/kg ^[2]		Not Available
1,3-Dinitrobenzene in Methanol:Acetonitrile	TOXICITY		IRRITATION
	dermal (rat) LD50: 1200 mg/kg ^[2]		Eye (Rodent - rabbit): 100mg
	Oral (Rat) LD50: 59.5 mg/kg ^[2]		
2,6-dinitrotoluene	TOXICITY		IRRITATION
	Oral (Rat) LD50: 177 mg/kg ^[2]		Skin (Rodent - rabbit): 500mg/24H - Mild
2,4-Dinitrotoluene	TOXICITY		IRRITATION
	Dermal (Guinea Pig) LD50: >1000 mg/kg ^[2]		Skin (Rodent - rabbit): 500mg/24H - Mild
	Oral (Rat) LD50: 268 mg/kg ^[2]		
1,3,5-Trinitrobenzene	TOXICITY		IRRITATION
	Oral (Rat) LD50: 275 mg/kg ^[2]		Eye (Rodent - rabbit): 100mg - Severe
			Skin (Rodent - rabbit): 33%/5D (intermittent)
Trinitrotoluene (TNT)	TOXICITY		IRRITATION
	Inhalation (Rat) LC50: >1.01 mg/l4h ^[1]		Eye: no adverse effect observed (not irritating) ^[1]
	Oral (Rat) LD50: 607 mg/kg ^[2]		Skin (Rodent - rabbit): 500mg/24H - Mild
			Skin: adverse effect observed (irritating) ^[1]
cyclotrimethylenetrinitramine	TOXICITY		IRRITATION
	Oral (Rat) LD50: 100 mg/kg ^[2]		Eye: no adverse effect observed (not irritating) ^[1]
			Skin: no adverse effect observed (not irritating) ^[1]
tetryl	TOXICITY	IRRITATION	
	Not Available	Eye (Rodent - rabbit): 100mg - Severe	
HMX	TOXICITY		IRRITATION
	Dermal (rabbit) LD50: 630 mg/kg ^[2]		Skin (Rodent - rabbit): 500mg - Mild
	Oral (Rat) LD50: 6490 mg/kg ^[2]		

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

2,6-DINITROTOLUENE	Oral (rat) TDLo: 13500 mg/kg/90D-I
2,4-DINITROTOLUENE	WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.
CYCLOTRIMETHYLENETRINITRAMINE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.
TETRYL	Bacterial cell mutagen The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions.
Explosive Stock Solution A & ACETONITRILE & 4-AMINO-2,6-DINITROTOLUENE & 1,3-DINITROBENZENE IN METHANOL:ACETONITRILE & 1,3,5-TRINITROBENZENE & TRINITROTOLUENE (TNT) & HMX	Absorption of acetonitrile occurs after oral, skin, or inhalation exposure. The liquid or vapour is irritating to the skin, eyes, and airways. At high enough doses, death can occur quickly from respiratory failure. Lower doses cause typical symptoms of cyanide poisoning such as salivation, nausea, vomiting, anxiety, confusion, rapid and difficult breathing, rapid pulse, unconsciousness, and convulsions.
ACETONITRILE & TETRYL	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Continued...

ACETONITRILE & METHANOL & 2,6-DINITROTOLUENE	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.			
2,6-DINITROTOLUENE & 2,4-DINITROTOLUENE	For dinitrotoluene (dinitromethylbenzene; DNT): In humans, heavy DNT exposure causes signs of methaemoglobin in the blood, which are reversible 2-3 days after removal from exposure. Signs of disturbances in liver function and exposure-dependent toxic effects on the kidney tubules were additionally found in exposed workers. In humans, DNT is absorbed after inhalation and skin contact, and is rapidly metabolized and excreted in urine. Acute toxicity: Animal testing indicates that DNT has relatively low acute toxicity by skin contact and moderately toxic by swallowing. DNT is not considered to irritate the human eye.			
Acute Toxicity	✓	Carcinogenicity	✗	
Skin Irritation/Corrosion	✓	Reproductivity	✓	
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✓	
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✓	
Mutagenicity	✗	Aspiration Hazard	✗	

Legend: ✗ – Data either not available or does not fill the criteria for classification
✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

Explosive Stock Solution A	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
acetonitrile	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	72h	Algae or other aquatic plants	>1000mg/l	2
	EC50	48h	Crustacea	>1000mg/l	2
	NOEC(ECx)	24h	Crustacea	<0.001mg/L	4
	LC50	96h	Fish	>100mg/l	2
methanol	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	48h	Crustacea	>10000mg/l	2
	EC50	96h	Algae or other aquatic plants	14.11-20.623mg/l	4
	NOEC(ECx)	720h	Fish	0.007mg/L	4
	LC50	96h	Fish	290mg/l	2
4-Amino-2,6-dinitrotoluene	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	48h	Crustacea	5.2mg/L	4
	EC50(ECx)	48h	Crustacea	5.2mg/L	4
	EC50	96h	Algae or other aquatic plants	10.272-13.347mg/L	4
	LC50	96h	Fish	5-15mg/L	4
1,3-Dinitrobenzene in Methanol:Acetonitrile	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	72h	Algae or other aquatic plants	0.22mg/L	5
	EC50	48h	Crustacea	24-31.4mg/L	4
	EC50	96h	Algae or other aquatic plants	0.24mg/l	1
	EC03(ECx)	2h	Algae or other aquatic plants	0.07mg/L	4
	LC50	96h	Fish	1.2-2.3mg/L	4
2,6-dinitrotoluene	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	504h	Crustacea	0.06mg/L	5
	LC50	96h	Fish	17.2-20.2mg/L	4
	EC50	72h	Algae or other aquatic plants	11mg/L	4
	EC50	48h	Crustacea	21.7mg/L	4
	EC50	96h	Algae or other aquatic plants	12mg/L	4
2,4-Dinitrotoluene	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	48h	Crustacea	22mg/l	4
	NOEC(ECx)	504h	Crustacea	0.02mg/L	5
	EC50	96h	Algae or other aquatic plants	0.07-0.1mg/L	4
	LC50	96h	Fish	6.3mg/L	4

1,3,5-Trinitrobenzene	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	48h	Crustacea	2.63-3.38mg/L	4
	NOEC(ECx)	768h	Fish	0.08mg/L	4
	LC50	96h	Fish	0.34-0.43mg/L	4
Trinitrotoluene (TNT)	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	72h	Algae or other aquatic plants	0.19mg/l	2
	EC50	48h	Crustacea	9.49mg/l	2
	NOEC(ECx)	6480h	Fish	0.005mg/l	4
	EC50	96h	Algae or other aquatic plants	0.477-0.659mg/L	4
	LC50	96h	Fish	0.7-1mg/l	4
cyclotrimethylenetrinitramine	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	72h	Algae or other aquatic plants	>32.36mg/l	2
	EC50	48h	Crustacea	>17mg/l	2
	NOEC(ECx)	96h	Fish	0.01mg/L	4
	EC50	96h	Algae or other aquatic plants	>36.69mg/l	4
	LC50	96h	Fish	0.017-0.039mg/L	4
tetryl	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	96h	Crustacea	0.54mg/l	4
HMX	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	72h	Algae or other aquatic plants	>2.61mg/l	2
	EC50	48h	Crustacea	>32mg/L	4
	NOEC(ECx)	72h	Algae or other aquatic plants	2.61mg/l	2
	EC50	96h	Algae or other aquatic plants	>6.516mg/L	4
	LC50	96h	Fish	8.8-26mg/L	4
Legend:	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. US EPA, Ecotox database - Aquatic Toxicity Data 4. ECETOC Aquatic Hazard Assessment Data 5. NITE (Japan) - Bioconcentration Data 6. METI (Japan) - Bioconcentration Data 7. Vendor Data				

On the basis of available evidence concerning either toxicity, persistence, potential to accumulate and or observed environmental fate and behaviour, the material may present a danger, immediate or long-term and /or delayed, to the structure and/ or functioning of natural ecosystems.

The compounds 2-amino-4,6-dinitrotoluene (2A-DNT) and 4-amino-2,6-dinitrotoluene (4A-DNT), reduction products of 2,4,5-trinitrotoluene (TNT), are rapidly formed by microbial degradation when TNT is released to the soil.

Environmental Fate: 2A-DNT is photosensitive at wavelengths >290nm indicating that it may have the potential to undergo photolytic degradation. Study shows that 2A-DNT was degraded in the presence of mixed microbial isolates, undifferentiated sludge samples, and in the presence of pure culture of Pseudomonas spp. It is suggested that 4A-DNT may also undergo a similar range of interactions.

For Methanol: Log Kow: -0.82 to -0.66; Koc: 1; Henry s Law Constant: 4.55x10-6 atm-cu m/mole; Vapor Pressure: 127 mm Hg; BCF: < 10.

Atmospheric Fate: Methanol is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase methanol is broken down in the atmosphere by reactions with hydroxyl radicals; the half-life for this reaction in air is estimated to be 17 days.

Terrestrial Fate: Methanol is expected to have very high mobility in soil.

Soil Guidelines: Dutch Criteria:
free cyanide: 1 mg/kg (target)
20 mg/kg (intervention)
complex cyanide (pH 5): 5 mg/kg (target)
50 mg/kg (intervention)

Air Quality Standards: no safe guidelines recommended due to carcinogenic properties.

DO NOT discharge into sewer or waterways.

Abiotic Effects: Acetonitrile is a volatile organic compound (VOC) substance, thus it is a contributor to the formation of photochemical smog in the presence of other VOCs.

Transport: Acetonitrile is primarily removed by volatilization and leaching into groundwater. It has low adsorption potential to soils. Air - Acetonitrile may persist in the troposphere and can be transported over long distances.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
acetonitrile	HIGH (Half-life = 360 days)	HIGH (Half-life = 541.29 days)
methanol	LOW	LOW
4-Amino-2,6-dinitrotoluene	HIGH	HIGH
1,3-Dinitrobenzene in Methanol:Acetonitrile	HIGH (Half-life = 360 days)	HIGH (Half-life = 875 days)
2,6-dinitrotoluene	HIGH (Half-life = 360 days)	MEDIUM (Half-life = 118.33 days)
2,4-Dinitrotoluene	HIGH (Half-life = 360 days)	MEDIUM (Half-life = 118.33 days)
1,3,5-Trinitrobenzene	HIGH	HIGH
Trinitrotoluene (TNT)	HIGH	HIGH
cyclotrimethylenetrinitramine	HIGH	HIGH
tetryl	HIGH	HIGH
HMX	HIGH	HIGH

Explosive Stock Solution A

Bioaccumulative potential

Ingredient	Bioaccumulation
acetonitrile	LOW (BCF = 0.4)
methanol	LOW (BCF = 10)
4-Amino-2,6-dinitrotoluene	LOW (LogKOW = 1.84)
1,3-Dinitrobenzene in Methanol:Acetonitrile	LOW (BCF = 7.5)
2,6-dinitrotoluene	LOW (LogKOW = 2.1757)
2,4-Dinitrotoluene	HIGH (BCF = 2507)
1,3,5-Trinitrobenzene	LOW (LogKOW = 1.18)
Trinitrotoluene (TNT)	LOW (LogKOW = 1.6)
cyclotrimethylenetrinitramine	LOW (LogKOW = 0.87)
tetryl	LOW (LogKOW = 1.6441)
HMX	LOW (LogKOW = 0.8242)

Mobility in soil

Ingredient	Mobility
acetonitrile	LOW (Log KOC = 4.5)
methanol	HIGH (Log KOC = 1)
4-Amino-2,6-dinitrotoluene	LOW (Log KOC = 100.5)
1,3-Dinitrobenzene in Methanol:Acetonitrile	LOW (Log KOC = 220.1)
2,6-dinitrotoluene	LOW (Log KOC = 371.4)
2,4-Dinitrotoluene	LOW (Log KOC = 363.8)
1,3,5-Trinitrobenzene	LOW (Log KOC = 1087)
Trinitrotoluene (TNT)	LOW (Log KOC = 1834)
cyclotrimethylenetrinitramine	LOW (Log KOC = 195.4)
tetryl	LOW (Log KOC = 2141)
HMX	LOW (Log KOC = 1853)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	- Containers may still present a chemical hazard/ danger when empty. - Return to supplier for reuse/ recycling if possible. Otherwise: - If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. - Where possible retain label warnings and SDS and observe all notices pertaining to the product. Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: - Reduction - Reuse - Recycling - Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. DO NOT allow wash water from cleaning or process equipment to enter drains. - It may be necessary to collect all wash water for treatment before disposal. - In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. - Where in doubt contact the responsible authority. - Recycle wherever possible. - Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified. - Dispose of by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material). - Decontaminate empty containers.
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SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO
HAZCHEM	*3Y

Land transport (ADG)

14.1. UN number or ID number	1993
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14.2. UN proper shipping name	FLAMMABLE LIQUID, N.O.S. (contains acetonitrile and methanol)		
14.3. Transport hazard class(es)	Class	3	
	Subsidiary Hazard	Not Applicable	
14.4. Packing group	III		
14.5. Environmental hazard	Not Applicable		
14.6. Special precautions for user	Special provisions	223 274	
	Limited quantity	5 L	

Air transport (ICAO-IATA / DGR)

14.1. UN number	1993		
14.2. UN proper shipping name	Flammable liquid, n.o.s. * (contains acetonitrile and methanol); FLAMMABLE LIQUID, N.O.S. (having a flash point below 23°C and viscous according to ADR 2.2.3.1.4), packing group III (contains acetonitrile and methanol); FLAMMABLE LIQUID, N.O.S. (having a flash point below 23°C and viscous according to ADR 2.2.3.1.4), packing group III (contains acetonitrile and methanol)		
14.3. Transport hazard class(es)	ICAO/IATA Class	3	
	ICAO / IATA Subsidiary Hazard	Not Applicable	
	ERG Code	3L	
14.4. Packing group	III		
14.5. Environmental hazard	Not Applicable		
14.6. Special precautions for user	Special provisions	A3	
	Cargo Only Packing Instructions	366	
	Cargo Only Maximum Qty / Pack	220 L	
	Passenger and Cargo Packing Instructions	355	
	Passenger and Cargo Maximum Qty / Pack	60 L	
	Passenger and Cargo Limited Quantity Packing Instructions	Y344	
	Passenger and Cargo Limited Maximum Qty / Pack	10 L	

Sea transport (IMDG-Code / GGVSee)

14.1. UN number	1993		
14.2. UN proper shipping name	FLAMMABLE LIQUID, N.O.S. (contains acetonitrile and methanol)		
14.3. Transport hazard class(es)	IMDG Class	3	
	IMDG Subsidiary Hazard	Not Applicable	
14.4. Packing group	III		
14.5 Environmental hazard	Not Applicable		
14.6. Special precautions for user	EMS Number	F-E, S-E	
	Special provisions	223 274 955	
	Limited Quantities	5 L	

14.7. Maritime transport in bulk according to IMO instruments

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code
Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
acetonitrile	Not Applicable
methanol	Not Applicable
4-Amino-2,6-dinitrotoluene	Not Applicable
1,3-Dinitrobenzene in Methanol:Acetonitrile	Not Applicable
2,6-dinitrotoluene	Not Applicable
2,4-Dinitrotoluene	Not Applicable
1,3,5-Trinitrobenzene	Not Applicable
Trinitrotoluene (TNT)	Not Applicable
cyclotrimethylenetrinitramine	Not Applicable
tetryl	Not Applicable
HMX	Not Applicable

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
acetonitrile	Not Applicable

Product name	Ship Type
methanol	Not Applicable
4-Amino-2,6-dinitrotoluene	Not Applicable
1,3-Dinitrobenzene in Methanol:Acetonitrile	Not Applicable
2,6-dinitrotoluene	Not Applicable
2,4-Dinitrotoluene	Not Applicable
1,3,5-Trinitrobenzene	Not Applicable
Trinitrotoluene (TNT)	Not Applicable
cyclotrimethylenetrinitramine	Not Applicable
tetryl	Not Applicable
HMX	Not Applicable

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

acetoneitrile is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

methanol is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

4-Amino-2,6-dinitrotoluene is found on the following regulatory lists

Not Applicable

1,3-Dinitrobenzene in Methanol:Acetonitrile is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

2,6-dinitrotoluene is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

2,4-Dinitrotoluene is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

1,3,5-Trinitrobenzene is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Trinitrotoluene (TNT) is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

cyclotrimethylenetrinitramine is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

tetryl is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

HMX is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

Additional Regulatory Information

Not Applicable

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	No (4-Amino-2,6-dinitrotoluene; 1,3,5-Trinitrobenzene)
Canada - DSL	No (4-Amino-2,6-dinitrotoluene; 1,3,5-Trinitrobenzene; tetryl)
Canada - NDSL	No (acetonitrile; methanol; 4-Amino-2,6-dinitrotoluene; 1,3-Dinitrobenzene in Methanol:Acetonitrile; 2,6-dinitrotoluene; 2,4-Dinitrotoluene; 1,3,5-Trinitrobenzene; Trinitrotoluene (TNT); cyclotrimethylenetrinitramine; HMX)
China - IECSC	No (4-Amino-2,6-dinitrotoluene)
Europe - EINEC / ELINCS / NLP	No (4-Amino-2,6-dinitrotoluene)
Japan - ENCS	No (4-Amino-2,6-dinitrotoluene)
Korea - KECI	No (4-Amino-2,6-dinitrotoluene; 1,3,5-Trinitrobenzene; HMX)
New Zealand - NZIoC	No (4-Amino-2,6-dinitrotoluene; 2,6-dinitrotoluene; 1,3,5-Trinitrobenzene)
Philippines - PICCS	No (4-Amino-2,6-dinitrotoluene; 2,6-dinitrotoluene; cyclotrimethylenetrinitramine; tetryl; HMX)
USA - TSCA	TSCA Inventory 'Active' substance(s) (acetonitrile; methanol; 1,3-Dinitrobenzene in Methanol:Acetonitrile; 2,6-dinitrotoluene; 2,4-Dinitrotoluene; 1,3,5-Trinitrobenzene; Trinitrotoluene (TNT); cyclotrimethylenetrinitramine; tetryl; HMX); No (4-Amino-2,6-dinitrotoluene)
Taiwan - TCSI	Yes
Mexico - INSQ	No (4-Amino-2,6-dinitrotoluene; 1,3-Dinitrobenzene in Methanol:Acetonitrile)
Vietnam - NCI	No (4-Amino-2,6-dinitrotoluene; 1,3,5-Trinitrobenzene; tetryl; HMX)
Russia - FBEPH	No (4-Amino-2,6-dinitrotoluene; 1,3,5-Trinitrobenzene; cyclotrimethylenetrinitramine; tetryl)
UAE - Control List (Banned/Restricted Substances)	No (acetonitrile; methanol; 4-Amino-2,6-dinitrotoluene; 1,3-Dinitrobenzene in Methanol:Acetonitrile; 2,6-dinitrotoluene; 2,4-Dinitrotoluene; 1,3,5-Trinitrobenzene; Trinitrotoluene (TNT); cyclotrimethylenetrinitramine; tetryl; HMX)
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 Other information

Revision Date	30/04/2026
Initial Date	04/09/2015

SDS Version Summary

Version	Date of Update	Sections Updated
7.9	30/04/2026	Hazards identification - Classification

Other information

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

- PC - TWA: Permissible Concentration-Time Weighted Average
- PC - STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit,
- IDLH: Immediately Dangerous to Life or Health Concentrations
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL: No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index
- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration
- MARPOL: International Convention for the Prevention of Pollution from Ships
- IMSBC: International Maritime Solid Bulk Cargoes Code
- IGC: International Gas Carrier Code
- IBC: International Bulk Chemical Code

- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Explosive Stock Solution A