



2,4-Dinitrotoluene

Novachem Pty Ltd

Version No: 1.1

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Chemwatch Hazard Alert Code: 4

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S.GHS.AUS.EN

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

Product Identifier

Product name	2,4-Dinitrotoluene
Chemical Name	2,4-dinitrotoluene
Synonyms	1-Methyl-2,4-dinitrobenzene; 2,4-DNT
Proper shipping name	DINITROTOLUENES, SOLID
Chemical formula	C ₇ H ₆ N ₂ O ₄
Other means of identification	R-049N
CAS number	121-14-2*

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 supplier 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 numbers	13 11 26	13 11 26
Other emergency telephone numbers	Not Available	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	Not Applicable
Classification [1]	Acute Toxicity (Oral) Category 3, Acute Toxicity (Dermal) Category 3, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2B, Acute Toxicity (Inhalation) Category 3, Germ Cell Mutagenicity Category 2, Carcinogenicity Category 2, Reproductive Toxicity Category 1A, Specific Target Organ Toxicity - Repeated Exposure Category 2, Hazardous to the Aquatic Environment Acute Hazard Category 1, Hazardous to the Aquatic Environment Long-Term Hazard Category 1
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)

H301	Toxic if swallowed.
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H311	Toxic in contact with skin.
H315	Causes skin irritation.
H320	Causes eye irritation.
H331	Toxic if inhaled.
H341	Suspected of causing genetic defects.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P260	Do not breathe dust/fume.
P264	Wash all exposed external body areas thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.

Precautionary statement(s) Response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider.
P308+P313	IF exposed or concerned: Get medical advice/ attention.
P330	Rinse mouth.
P302+P352	IF ON SKIN: Wash with plenty of water.

Precautionary statement(s) Storage

P403+P233	Store in a well-ventilated place. Keep container tightly closed.
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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SECTION 3 Composition / information on ingredients

Substances

CAS No	%[weight]	Name
121-14-2	100	2,4-dinitrotoluene

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

Mixtures

See section above for composition of Substances

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none">▶ 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	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none">▶ 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	<ul style="list-style-type: none">▶ 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.▶ 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	<ul style="list-style-type: none">▶ 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

Continued...

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- 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.

Indication of any immediate medical attention and special treatment needed

Periodic medical examinations, including a complete blood count and liver function tests, are recommended for workers with dinitrotoluene (DNT) exposure.

In male workers DNT metabolites produced as a result of exposure in a single shift are largely excreted in the urine by the beginning of the following shift. Metabolites include dinitrobenzoic acid (52%), 2-amino-4-nitrobenzoic acid (37.2) and dinitrobenzol glucuronide (9.5%).

Symptoms of vasodilation and reflex tachycardia may present following organic nitrate overdose; most organic nitrates are extensively metabolised by hydrolysis to inorganic nitrites. Organic nitrates and nitrites are readily absorbed through the skin, lungs, mucosa and gastro-intestinal tract.

The toxicity of nitrates and nitrites result from their vasodilating properties and their propensity to form methaemoglobin.

- ▶ Most produce a peak effect within 30 minutes.
- ▶ Clinical signs of cyanosis appear before other symptoms because of the dark pigmentation of methaemoglobin.
- ▶ Initial attention should be directed towards improving oxygen delivery, with assisted ventilation, if necessary. Hyperbaric oxygen has not demonstrated conclusive benefits.
- ▶ Institute cardiac monitoring, especially in patients with coronary artery or pulmonary disease.
- ▶ Hypotension should respond to Trendelenburg's position and intravenous fluids; otherwise dopamine may be needed.
- ▶ Naloxone, glucose and thiamine should be given if a multiple ingestion is suspected.
- ▶ Decontaminate using Ipecac Syrup for alert patients or lavage for obtunded patients who present within 2-4 hours of ingestion.
- ▶ Symptomatic patients with methaemoglobin levels over 30% should receive methylene blue. (Cyanosis alone, is not an indication for treatment). The usual dose is 1-2 mg/kg of a 1% solution (10 mg/ml) IV over 5 minutes; repeat, using the same dose if symptoms of hypoxia fail to subside within 1 hour.

[Ellenhorn and Barceloux: Medical Toxicology]

BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens collected from a healthy worker who has been exposed at the Exposure Standard (ES or TLV):

Determinant	Index	Sampling Time	Comments
1. Methaemoglobin in blood	1.5% of haemoglobin	During or end of shift	B,NS,SQ

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

NS: Non-specific determinant;also observed after exposure to other materials

SQ: Semi-quantitative determinant - Interpretation may be ambiguous; should be used as a screening test or confirmatory test.

SECTION 5 Firefighting measures**Extinguishing media**

- ▶ 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	<ul style="list-style-type: none">▶ Alert Fire Brigade and tell them location and nature of hazard.▶ Wear breathing apparatus plus protective gloves in the event of a fire.▶ Prevent, by any means available, spillage from entering drains or water courses.▶ Use fire fighting procedures suitable for surrounding area.
Fire/Explosion Hazard	<p>WARNING: May EXPLODE on heating!!!</p> <ul style="list-style-type: none">▶ Combustible solid which burns but propagates flame with difficulty; it is estimated that most organic dusts are combustible (circa 70%) - according to the circumstances under which the combustion process occurs, such materials may cause fires and / or dust explosions.▶ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions).▶ Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust (420 micron or less) may burn rapidly and fiercely if ignited - particles exceeding this limit will generally not form flammable dust clouds; once initiated, however, larger particles up to 1400 microns diameter will contribute to the propagation of an explosion. <p>Combustion products include: carbon monoxide (CO) carbon dioxide (CO2) nitrogen oxides (NOx) other pyrolysis products typical of burning organic material. May emit poisonous fumes.</p>
HAZCHEM	2X

SECTION 6 Accidental release measures

2,4-Dinitrotoluene**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	<ul style="list-style-type: none">▶ Clean up waste regularly and abnormal spills immediately.▶ Avoid breathing dust and contact with skin and eyes.▶ Wear protective clothing, gloves, safety glasses and dust respirator.▶ Use dry clean up procedures and avoid generating dust.
Major Spills	

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

SECTION 7 Handling and storage**Precautions for safe handling**

Safe handling	<ul style="list-style-type: none">▶ Avoid all personal contact, including inhalation.▶ Wear protective clothing when risk of exposure occurs.▶ Use in a well-ventilated area.▶ Prevent concentration in hollows and sumps.▶ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions)▶ Minimise airborne dust and eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, and flame.▶ Establish good housekeeping practices.▶ Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds.
Other information	<ul style="list-style-type: none">▶ Store in original containers.▶ Keep containers securely sealed.▶ Store in a cool, dry, well-ventilated area.▶ Store away from incompatible materials and foodstuff containers.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none">▶ Glass container is suitable for laboratory quantities▶ Lined metal can, lined metal pail/ can.▶ Plastic pail.▶ Polyliner drum.▶ Packing as recommended by manufacturer. <p>For low viscosity materials</p> <ul style="list-style-type: none">▶ Drums and jerricans must be of the non-removable head type.▶ Where a can is to be used as an inner package, the can must have a screwed enclosure. <p>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):</p> <ul style="list-style-type: none">▶ Removable head packaging;▶ Cans with friction closures and▶ low pressure tubes and cartridges <p>may be used.</p> <p>All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.</p>
Storage incompatibility	<ul style="list-style-type: none">▶ Polynitro derivatives of mono- and poly- cyclic systems are often explosives liable to detonate on grinding or impact.▶ The presence of two or more nitro groups (each with 2 oxygen atoms) on an aromatic nucleus often increase the reactivity of other substituents and the tendency towards explosive instability as oxygen balance is approached.▶ Aromatic nitro compounds range from slight to strong oxidizing agents. If mixed with reducing agents, including hydrides, sulfides and nitrides, they may begin a vigorous reaction that culminates in a detonation.▶ Avoid storage with reducing agents. <p>Dinitrotoluenes (DNT):</p> <ul style="list-style-type: none">▶ possess an explosive energy that is 85% that of trinitrotoluenes (TNT)▶ are often solids that may be shipped and stored in a molten state (flash point typically 207 deg. C) - may be transported as molten material under U.N. No 1600▶ solids are more sensitive to shock than are the liquids▶ dusts form explosive mixtures with air▶ commercial grades decompose at around 250 deg. C. with self-sustaining decomposition at around 280 deg. C. - organic contaminants and gritty foreign contaminants may lower these critical temperatures and increase sensitivity to explosion▶ in contact with strong oxidisers, caustics or reducing agents may cause fire and explosion▶ mixtures with nitric acid are explosive▶ in contact with sodium oxide, ignite▶ are incompatible with chemically active metals, e.g. tin, zinc.

SECTION 8 Exposure controls / personal protection**Control parameters**

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Not Available

Emergency Limits

Continued...

2,4-Dinitrotoluene

Ingredient	TEEL-1	TEEL-2	TEEL-3
2,4-dinitrotoluene	0.6 mg/m3	12 mg/m3	200 mg/m3


Ingredient	Original IDLH	Revised IDLH
2,4-dinitrotoluene	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
2,4-dinitrotoluene	E	≤ 0.01 mg/m³

Notes: Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Wear chemical protective gloves, e.g. PVC. Wear safety footwear or safety gumboots, e.g. Rubber <p>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.</p> <p>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.</p> <p>Personal hygiene is a key element of effective hand care.</p>
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> Overalls. Eyewash unit. Barrier cream. Skin cleansing cream.

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:

2,4-Dinitrotoluene

Material	CPI
SARANEX-23	A

* 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.

Respiratory protection

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

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	-	PAPR-P1
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

* - Negative pressure demand ** - Continuous flow

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)

· Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.

· The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).

· Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.

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2,4-Dinitrotoluene

· Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.

· Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)

· Use approved positive flow mask if significant quantities of dust becomes airborne.

· Try to avoid creating dust conditions.

Where significant concentrations of the material are likely to enter the breathing zone, a Class P3 respirator may be required.

Class P3 particulate filters are used for protection against highly toxic or highly irritant particulates.

Filtration rate: Filters at least 99.95% of airborne particles

Suitable for:

· Relatively small particles generated by mechanical processes eg. grinding, cutting, sanding, drilling, sawing.

· Sub-micron thermally generated particles e.g. welding fumes, fertilizer and bushfire smoke.

· Biologically active airborne particles under specified infection control applications e.g. viruses, bacteria, COVID-19, SARS

· Highly toxic particles e.g. Organophosphate Insecticides, Radionuclides, Asbestos

Note: P3 Rating can only be achieved when used with a Full Face Respirator or Powered Air-Purifying Respirator (PAPR). If used with any other respirator, it will only provide filtration protection up to a P2 rating.

If inhalation risk of exposure to dinitrotoluenes (DNT) or trinitrotoluenes (TNT) exists, wear air-supplied breathing apparatus. In confined spaces or at elevated temperatures, where mist of fumes are present, an impervious suit ventilated by a supply of clean, cooled air may be required.

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	<p>Contains a chemical subject to Prior Informed Consent (PIC) Regulation which administers the import and export of certain hazardous chemicals and places obligations on companies who wish to export these chemicals to non-EU countries. It aims to promote shared responsibility and cooperation in the international trade of hazardous chemicals, and to protect human health and the environment by providing developing countries with information on how to store, transport, use and dispose of hazardous chemicals safely.</p> <p>This Regulation implements, within the European Union, the Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade.</p> <p>The PIC Regulation applies to banned or severely restricted chemicals listed in Annex I, containing industrial chemicals, pesticides and biocides. The export of these chemicals is subject to two types of requirement: export notification and explicit consent.</p> <p>The PIC Regulation also applies to chemicals that are banned for export as listed in Annex V and to all chemicals when exported regarding their packaging and labelling, which must comply with relevant EU legislation.</p> <p>Powder</p>		
Physical state	Solid	Relative density (Water = 1)	Not Available
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	400
pH (as supplied)	Not Available	Decomposition temperature (°C)	Not Available
Melting point / freezing point (°C)	70-71	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	182.13
Flash point (°C)	155	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Applicable
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	<0.01	Gas group	Not Available
Solubility in water	Partly miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	6.27	VOC g/L	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.

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2,4-Dinitrotoluene

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

Inhaled	<p>The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of dusts, or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.</p> <p>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.</p> <p>Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects.</p>
Ingestion	<p>Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.</p> <p>The main concern with exposure to inorganic nitrate is its biological reduction to the reactive and toxic nitrite. Nitrate itself is relatively harmless, but where bacteria are present and the environment is anaerobic (lacking in oxygen), nitrate can be converted to nitrite. The main sites of this reaction are the mouth and stomach, but nitrite formation in the bladder (urinary infection) may also be of some toxicological importance.</p> <p>Adults have tolerated large doses of sodium nitrate and ammonium nitrate (> 100 milligrams of nitrate per kilogram body weight), in some cases repeated for several days for medical or experimental purposes, with only minor effects in some subjects (slight amount of methaemoglobin in the blood, diarrhea and vomiting).</p> <p>The lethal oral dose of nitrite has been variously reported as between 0.7 and 6 grams (approximately 10-100 milligrams/kilogram body weight). This may be lower for children (especially newborns), the elderly, and people with certain enzyme deficiencies. Symptoms develop within 15-45 minutes.</p> <p>Inorganic nitrites produce smooth muscle relaxation, methaemoglobin in the blood, and cyanosis (a bluing of the extremities).</p> <p>The substance and/or its metabolites may bind to haemoglobin inhibiting normal uptake of oxygen. This condition, known as "methaemoglobinemia", is a form of oxygen starvation (anoxia).</p> <p>Symptoms include cyanosis (a bluish discolouration skin and mucous membranes) and breathing difficulties. Symptoms may not be evident until several hours after exposure.</p> <p>Symptoms of acute poisoning by dinitrotoluenes (DNT) include central nervous system depression, respiratory depression, muscular inco-ordination and bluing of the extremities. Animal testing suggests 3,5-DNT is more toxic than the other isomers.</p>
Skin Contact	<p>Skin contact with the material may produce toxic effects; systemic effects may result following absorption.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>Any minor contact with dinitrotoluenes is capable of causing irritant contact dermatitis. Animal testing showed that the different isomers had varying degrees of irritation potential.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>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.</p> <p>There is some evidence to suggest that the material may cause mild but significant 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.</p>
Eye	<p>There is some evidence to suggest that this material can cause eye irritation and damage in some persons.</p>
Chronic	<p>Studies show that inhaling this substance for over a long period (e.g. in an occupational setting) may increase the risk of cancer.</p> <p>There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.</p> <p>Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.</p> <p>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.</p> <p>Ample evidence exists that this material directly causes reduced fertility</p> <p>Ample evidence exists that developmental disorders are directly caused by human exposure to the material.</p> <p>Chronic exposure to nitro compounds of aromatic hydrocarbons have been known to cause liver and kidney damage.</p> <p>Repeated or prolonged exposure to dinitrotoluenes (DNT) may cause anaemia, jaundice, cyanosis, central nervous system depression and liver damage. Reduced sperm counts in men have been noted and wives of exposed workers have experienced more frequent miscarriages. DNT also seems to increase the likelihood of death from ischaemic heart disease. There is no evidence to suggest that DNT causes cancer in humans.</p>

2,4-Dinitrotoluene	TOXICITY	IRRITATION
	dermal (guinea pig) LD50: >1000 mg/kg ^[2]	Not Available
	Oral (Rat) LD50: 268 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	

2,4-Dinitrotoluene	Laboratory (in vitro) and animal studies show, exposure to the material may result in a possible risk of irreversible effects, with the possibility of producing mutation.
2,4-DINITROTOLUENE	<p>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.</p> <p>WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.</p>

2,4-Dinitrotoluene

2,4-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

2,4-Dinitrotoluene	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	48h	Crustacea	22mg/l	4
	EC50	96h	Algae or other aquatic plants	0.07-0.1mg/l	4
	LC50	96h	Fish	6.3mg/l	4
	NOEC(ECx)	504h	Crustacea	0.02mg/L	5
Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data					

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

Dinitrotoluenes (DNT) are moderately soluble in water, thus will make DNT easily transported to surface or groundwater. Buried ammunitions wastes are possible source of DNT that may enter the groundwater or transported as contaminated soil and sediment. DNTs are of major concern because of their persistence in water, plant uptake and possible leaching to groundwater. Air - DNT may undergo oxidation and indirect photolysis.

Substance has been evaluated and categorised as not being persistent, bioaccumulative, toxic (PBT) or very persistent, very bioaccumulative (vPvB).

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
2,4-dinitrotoluene	HIGH (Half-life = 360 days)	MEDIUM (Half-life = 118.33 days)

Bioaccumulative potential

Ingredient	Bioaccumulation
2,4-dinitrotoluene	HIGH (BCF = 2507)

Mobility in soil

Ingredient	Mobility
2,4-dinitrotoluene	LOW (KOC = 363.8)



SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> Containers may still present a chemical hazard/ danger when empty. Return to supplier for reuse/ recycling if possible. <p>Otherwise:</p> <ul style="list-style-type: none"> 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. 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. <p>Small quantities of dinitrotoluenes (DNT) may be destroyed by burning, but the operation should be performed by a person competent in destruction of explosives.</p>
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SECTION 14 Transport information

Labels Required

	
Marine Pollutant	
HAZCHEM	2X

Land transport (ADG)

UN number or ID number	3454	
UN proper shipping name	DINITROTOLUENES, SOLID	
Transport hazard class(es)	Class	6.1
	Subsidiary risk	Not Applicable
Packing group	II	
Environmental hazard	Environmentally hazardous	
Special precautions for user	Special provisions	Not Applicable
	Limited quantity	500 g

Air transport (ICAO-IATA / DGR)

UN number	3454	
UN proper shipping name	Dinitrotoluenes, solid	
Transport hazard class(es)	ICAO/IATA Class	6.1
	ICAO / IATA Subrisk	Not Applicable
	ERG Code	6L
Packing group	II	
Environmental hazard	Environmentally hazardous	
Special precautions for user	Special provisions	Not Applicable
	Cargo Only Packing Instructions	676
	Cargo Only Maximum Qty / Pack	100 kg
	Passenger and Cargo Packing Instructions	669
	Passenger and Cargo Maximum Qty / Pack	25 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Y644
	Passenger and Cargo Limited Maximum Qty / Pack	1 kg

Sea transport (IMDG-Code / GGVSee)

UN number	3454	
UN proper shipping name	DINITROTOLUENES, SOLID	
Transport hazard class(es)	IMDG Class	6.1
	IMDG Subrisk	Not Applicable
Packing group	II	
Environmental hazard	Marine Pollutant	
Special precautions for user	EMS Number	F-A, S-A
	Special provisions	Not Applicable
	Limited Quantities	500 g

Transport in bulk according to Annex II of MARPOL and the IBC code

Product name	Pollution Category	Ship Type
Dinitrotoluene (molten)	X	2

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

Product name	Group
2,4-dinitrotoluene	Not Available

2,4-Dinitrotoluene

Transport in bulk in accordance with the IGC Code

Product name	Ship Type
2,4-dinitrotoluene	Not Available

SECTION 15 Regulatory information

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

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

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (2,4-dinitrotoluene)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
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	14/07/2023
Initial Date	14/07/2023

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

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
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

2,4-Dinitrotoluene

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

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