MATERIAL SAFETY DATA SHEET

p-Nitrotoluene

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name:	p-Nitrotoluene ≥98%, for synthesis
CAS Number:	99-99-0
EC Number:	202-808-0

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

Product use:	Laboratory and analytical use Laboratory chemical
Uses advised against	Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household).

1.3 Details of the supplier of the safety data sheet

Company name:	East Harbour Group Ltd 20 Clough Road, Severalls Industrial Park Colchester, Essex, CO4 9QS United Kingdom
Telephone:	+44 (0) 333 242 0100
Email:	info@eastharbourgroup.com

1.4 Emergency telephone number

Emergency telephone:	0800 246 1274

Section 2: Hazardous identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Category	Hazard class and category	Hazard statement
3.1O	Acute toxicity (oral)	3	Acute Tox. 3	H301
3.1D	Acute toxicity (dermal)	3	Acute Tox. 3	H311
3.1I	Acute toxicity (inhal.)	3	Acute Tox. 3	H331
3.9	Specific target organ toxicity - repeated exposure	2	STOT RE 2	H373

For full text of abbreviations: see SECTION 16

The most important adverse physicochemical, human health and environmental effects
Delayed or immediate effects can be expected after short or long-term exposure.

2.2 Label elements
Pictogram

p-Nitrotoluene

GHS06, GHS08

Signal Word	Danger

Hazard statements

H301+H311+H331	Toxic if swallowed, in contact with skin or if inhaled
H373	May cause damage to organs (liver, testes) through prolonged or repeated exposure

Precautionary statements

Precautionary statements - prevention

P260	Do not breathe dust/fume/gas/mist/vapours/spray
P280	Wear protective gloves/protective clothing

Precautionary statements - response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P302+P352	IF ON SKIN: Wash with plenty of soap and water
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P311	Call a POISON CENTER or doctor/physician
P330	Rinse mouth

Precautionary statements - storage

P403+P233	Store in a well-ventilated place. Keep container tightly closed

Precautionary statements - disposal

P501	Dispose of contents/container to industrial combustion plant

2.3 Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

Endocrine disrupting properties

The substance has an endocrine disrupting potential.

Section 3: Composition/information on ingredients

3.1 Substances

Name of substance	p-Nitrotoluene
Molecular formula	$C_7H_7NO_2$
Molar mass	137.1 $^{g}/_{mol}$
CAS No	99-99-0

Section 4: First aid measures

4.1 Description of first aid measures

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p-Nitrotoluene

General notes
Take off contaminated clothing. Self-protection of the first aider

Following inhalation
Call a physician immediately. If breathing is irregular or stopped, administer artificial respiration.

Following skin contact
After contact with skin, wash immediately with plenty of water. In case of extensive skin contact serious poisoning possible. Call a physician in any case!.

Following eye contact
Rinse cautiously with water for several minutes. In all cases of doubt, or when symptoms persist, seek medical advice.

Following ingestion
Rinse mouth immediately and drink plenty of water. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed
Cardiac arrhythmias, Headache, Spasms, Dyspnoea, Methaemoglobinaemia, Blood pressure drop, Cyanosis (blue coloured blood)

4.3 Indication of any immediate medical attention and special treatment needed
None

Section 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
co-ordinate firefighting measures to the fire surroundings
water, foam, dry extinguishing powder, ABC-powder

Unsuitable extinguishing media
water jet

5.2 Special hazards arising from the substance or mixture
Combustible.

Hazardous combustion products
In case of fire may be liberated: Nitrogen oxides (NOx), Carbon monoxide (CO), Carbon dioxide (CO_2)

5.3 Advice for firefighters
In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus. Wear full chemical protective clothing.

p-Nitrotoluene

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe dust.

6.2 Environmental precautions
Keep away from drains, surface and ground water.

6.3 Methods and material for containment and cleaning up
Advice on how to contain a spill
Covering of drains. Take up mechanically.

Advice on how to clean up a spill
Take up mechanically. Control of dust.

Other information relating to spills and releases
Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections
Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13

Section 7: Handling and storage

7.1 Precautions for safe handling
Provision of sufficient ventilation. Use extractor hood (laboratory). Handle and open container with care. Avoid dust formation. Clear contaminated areas thoroughly.

Advice on general occupational hygiene
When using do not eat or drink. Thorough skin-cleansing after handling the product..

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed. Store in a dry place.

Incompatible substances or mixtures
Observe hints for combined storage.

Consideration of other advice:
Store locked up.

Ventilation requirements
Keep any substance that emits harmful vapours or gases in a place that allows these to be permanently extracted.

Specific designs for storage rooms or vessels
Recommended storage temperature: 15 - 25 °C

7.3 Specific end use(s)
No information available.

Section 8: Exposure controls/personal protection

8.1 Control parameters
National limit values
Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [mg/m³]	STEL [mg/m³]	Ceiling-C [mg/m³]	Notation	Source
AU	4-nitrotoluene	99-99-0	WES	11				WES

Notation

Ceiling-C	Ceiling value is a limit value above which exposure should not occur
STEL	Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

8.2 Exposure controls
Individual protection measures (personal protective equipment)
Eye/face protection

Use safety goggle with side protection.
Skin protection

• hand protection
Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent con tact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• type of material
NBR (Nitrile rubber)

• material thickness
>0,11 mm

• breakthrough times of the glove material
>480 minutes (permeation: level 6)

• other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection

Respiratory protection necessary at: Dust formation. Particulate filter device (EN 143). P3 (filters at least 99,95 % of airborne particles, colour code: White).

Environmental exposure controls
Keep away from drains, surface and ground water.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Form	crystalline
Colour	yellow
Odour	characteristic
Melting point/freezing point	44.5 °C (ECHA)
Boiling point or initial boiling point and boiling range	238.3 °C at 101 kPa (ECHA)
Flammability	this material is combustible, but will not ignite readily
Lower and upper explosion limit	1.6 vol% (LEL)
Flash point	103 °C at 1,013 hPa (ECHA)
Auto-ignition temperature	450 °C (ECHA) (relative self-ignition temperature for solids)
Decomposition temperature	not relevant
pH (value)	not applicable
Kinematic viscosity	not relevant
Solubility(ies)	
Water solubility	0,345 g/l at 20 °C (ECHA)
Partition coefficient	
Partition coefficient n-octanol/water (log value)	2.37 (25 °C) (ECHA)
Vapour pressure	0.13 hPa at 20 °C
Density and/or relative density	
Density	1.1 - 1.2 g/cm^3 at 20 °C
Relative vapour density	information on this property is not available
Particle characteristics	No data available.
Other safety parameters	
Oxidising properties	none

9.2 Other information

Information with regard to physical hazard classes	hazard classes acc. to GHS

(physical hazards): not relevant

Other safety characteristics There is no additional information.

Section 10: Stability and Reactivity

10.1 Reactivity
The product in the delivered form is not dust explosion capable; the enrichment of fine dust however leads to the danger of dust explosion.

10.2 Chemical stability
The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions
Violent reaction with: strong oxidiser, Strong alkali, Strong oxidiser, Ammonia (NH3), Strong acid, Reducing agent, Sulphur trioxide,
=> Explosive properties

10.4 Conditions to avoid
Keep away from heat.

10.5 Incompatible materials
plastic and rubber

10.6 Hazardous decomposition products
Hazardous combustion products: see section 5.

Section 11: Toxicological Information

11.1 Information on toxicological effects
Classification acc. to GHS
Acute toxicity
Toxic if swallowed. Toxic in contact with skin. Toxic if inhaled.

Acute toxicity					
Exposure route	**Endpoint**	**Value**	**Species**	**Method**	**Source**
dermal	LD50	>16,000 $^{mg}/_{kg}$	rabbit		TOXNET
oral	LD50	>2,250 $^{mg}/_{kg}$	rat		ECHA

Skin corrosion/irritation
Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation
Shall not be classified as seriously damaging to the eye or eye irritant.

Respiratory or skin sensitisation
Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity
Shall not be classified as germ cell mutagenic.

Carcinogenicity
Shall not be classified as carcinogenic.

Reproductive toxicity
Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure
Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure
May cause damage to organs (liver, testes) through prolonged or repeated exposure.

Hazard category	Target organ	Exposure route
2	Liver	If exposed
2	Testes	If exposed

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics
• If swallowed
Data are not available.

• If in eyes
causes slight to moderate irritation.

• If inhaled
irritant effects, headache.

• If on skin
causes slight to moderate irritation, risk of absorption via the skin.

• Other information
Other adverse effects, Cardiac arrhythmias, Dyspnoea, Blood pressure drop, Spasms, Methemoglobinemia, Cyanosis (blue coloured blood).

11.2 Endocrine disrupting properties
This substance is known as an "endocrine disruptor".

Section 12: Ecological Information

12.1 Toxicity
Toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute)				
Endpoint	**Value**	**Species**	**Source**	**Exposure time**
EC50	4,2 $^{mg}/_{l}$	aquatic invertebrates	ECHA	48 h
ErC50	22 $^{mg}/_{l}$	algae	ECHA	96 h

Aquatic toxicity (chronic)				
Endpoint	**Value**	**Species**	**Source**	**Exposure time**
EC50	5 $^{mg}/_{l}$	microorganisms	ECHA	15 min

Biodegradation
Data are not available.

12.2 Process of degradability
Theoretical Oxygen Demand with nitrification: 2,042 $^{mg}/_{mg}$
Theoretical Oxygen Demand: 1,633 $^{mg}/_{mg}$
Theoretical Carbon Dioxide: 2,246 $^{mg}/_{mg}$

Process of degradability		
Process	**Degradation rate**	**Time**
DOC removal	94 %	15 d
oxygen depletion	0.8 %	14 d

12.3 Bioaccumulative potential
Does not significantly accumulate in organisms.

n-octanol/water (log KOW)	2.37 (25 °C) (ECHA)
BCF	39.26

12.4 Mobility in soil

Henry's law constant	2.38 $^{Pa\ m3}/_{mol}$ at 25 °C (ECHA)

12.5 Results of PBT and vPvB assessment
Data are not available.

12.6 Endocrine disrupting properties
This substance is known as an "endocrine disruptor".

12.7 Other adverse effects
Data are not available.

Section 13: Disposal considerations

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information
Do not empty into drains.

Waste treatment of containers/packagings
Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used.

Relevant provisions relating to waste(Basel Convention)
Properties of waste which render it hazardous.
H6.1 Poisonous (Acute)
H11 Toxic (Delayed or chronic)

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

Section 14: Transport Information

14.1 UN number or ID number

UN RTDG	UN 3446
IMDG-Code	UN 3446
ICAO-TI	UN 3446

14.2 UN proper shipping name

UN RTDG	NITROTOLUENES, SOLID
IMDG-Code	NITROTOLUENES, SOLID
ICAO-TI	Nitrotoluenes, solid

14.3 Transport hazard class(es)

UN RTDG	6.1
IMDG-Code	6.1
ICAO-TI	6.1

14.4 Packing group

UN RTDG	II
IMDG-Code	II
ICAO-TI	II

14.5 Environmental hazards

hazardous to the aquatic environment

14.6 Special precautions for user

There is no additional information.

14.7 Transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

Transport information National regulations Additional information (UN RTDG)	
UN number	3446
Class	6.1
Environmental hazards	Yes Hazardous to the aquatic environment
Packing group	II
Danger label(s)	6.1, "Fish and tree"
	
Special provisions (SP)	- UN RTDG
Excepted quantities (EQ)	E4 Un RTDG
Limited quantities (LQ)	500 g UN RTDG

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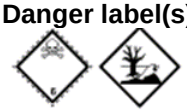
International Maritime Dangerous Goods Code (IMDG) - Additional information

Proper shipping name	NITROTOLUENES, SOLID
Particulars in the shipper's declaration	UN3446, NITROTOLUENES, SOLID, 6.1, II, MARINE POLLUTANT
Marine pollutant	yes (hazardous to the aquatic environment)
Danger label(s)	6.1, "Fish and tree"



Special provisions (SP)	-
Excepted quantities (EQ)	E4
Limited quantities (LQ)	500 g
EmS	F-A, S-A
Stowage category	A

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Proper shipping name	Nitrotoluenes, solid
Particulars in the shipper's declaration	UN3446, Nitrotoluenes, solid, 6.1, II
Environmental hazards	yes (hazardous to the aquatic environment)
Danger label(s)	6.1

Excepted quantities (EQ)	E4
Limited quantities (LQ)	1 kg

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
There is no additional information.

National regulations (Australia)
Australian Inventory of Chemical Substances (AICS)
Substance is listed.

Other information
Directive 94/33/EC on the protection of young people at work. Observe employment restrictions un der the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

National inventories

Country	Inventory	Status
AU	AIIC	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
KR	KECI	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TW	TCS	substance is listed

US	TSCA	substance is listed

Legend

AIIC	Australian Inventory of Industrial Chemicals
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
KECI	Korea Existing Chemicals Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

Section 16: Other Information

Indication of changes (revised safety data sheet)

Alignment to regulation: Globally Harmonized System of Classification and Labelling of Chemicals ("Purple book").

Restructuring: section 9, section 14

Section	Former entry (text/value)	Actual entry (text/value)	Safety relevant
2.1		Classification acc. to GHS: change in the listing (table)	yes
2.1		The most important adverse physicochemical, human health and environmental effects: Delayed or immediate effects can be expected after short or long-term exposure.	yes
2.2		Pictograms: change in the listing (table)	yes
2.2		Hazard statements: change in the listing (table)	yes
2.2		Precautionary statements - response: change in the listing (table)	yes
2.2	Labelling of packages where the contents do not exceed 125 ml: Signal word: Danger		yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.3	Other hazards: There is no additional information.	Other hazards	yes
2.3		Results of PBT and vPvB assessment: According to the results of its assessment, this substance is not a PBT or a vPvB.	yes

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2.3		Endocrine disrupting properties: The substance has an endocrine disrupting potential.	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
BCF	Bioconcentration factor
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
DGR	Dangerous Goods Regulations (see IATA/DGR)
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
LEL	Lower explosion limit (LEL)
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
STEL	Short-term exposure limit
TWA	Time-weighted average
UN RTDG	UN Recommendations on the Transport of Dangerous Good
vPvB	Very Persistent and very Bioaccumulative
WES	Safe Work Australia: Workplace exposure standards for airborne contaminants

Key literature references and sources for data

Safe Work Australia's Code of Practice for Labelling of Workplace Hazardous Chemicals (under WHS Regulations).
UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H373	May cause damage to organs (liver, testes) through prolonged or repeated exposure.

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