

Triethyl Citrate

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

1.1. Product identifier

Product name:	Triethyl Citrate
CAS Number:	77-93-0
EC Number:	201-070-7
REACH Registration Number	01-2119955435-32-0000

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

Product use:	Industrial use, Building and construction work, Polymer preparations and compounds, Plasticiser, Raw materials for paint, Food additive, Perfumes, fragrances, Cosmetics, personal care products, Pharmaceutical raw material, Use in agriculture
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Recommended restrictions on use	None known.
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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
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Telephone:	+44 (0) 333 242 0100
Email:	info@eastharbourgroup.com

1.4 Emergency telephone number

Emergency telephone:	0800 246 1274
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Section 2: Hazardous identification

2.1 Classification of the substance or mixture
Classification (REGULATION (EC) No 1272/2008)
Not a hazardous substance or mixture.

2.2 Label elements
Labelling (REGULATION (EC) No 1272/2008)
Not a hazardous substance or mixture.

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

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Ecological information

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Section 3: Composition/information on ingredients

3.1 Substances

Substance name	Triethyl citrate
CAS-No.	77-93-0
EC-No.	201-070-7
Chemical nature	Liquid
REACH Registration Number	01-2119955435-32-0000
Remarks	No hazardous ingredients

Section 4: First aid measures

4.1 Description of first aid measures

General advice

Do not leave the victim unattended.

If inhaled

If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact

In case of contact, immediately flush skin with plenty of water.

In case of eye contact

Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
If eye irritation persists, consult a specialist.

If swallowed

Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms

No information available.

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Risks

None known.

4.3 Indication of any immediate medical attention and special treatment needed**Treatment**

Treat symptomatically.

Section 5: Fire-fighting measures

5.1 Fire Fighting Media and Instructions:**Suitable extinguishing media**

Water spray
Dry powder
Foam
Carbon dioxide (CO₂)

Unsuitable extinguishing media

None

5.2 Special hazards arising from the substance or mixture**Hazardous combustion products**

Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

5.3 Advice for firefighters**Special protective equipment for firefighters**

Wear self-contained breathing apparatus for firefighting if necessary.

Further information

Standard procedure for chemical fires.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures**Personal precautions**

Avoid contact with eyes.
Avoid inhalation of vapour or mist.
Ensure adequate ventilation, especially in confined areas.
Refer to protective measures listed in sections 7 and 8.

6.2 Environmental precautions**Environmental precautions**

If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up**Methods for cleaning up**

Wipe up with absorbent material (e.g. cloth, fleece).
Keep in suitable, closed containers for disposal.

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6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

Section 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

For personal protection see section 8.

Smoking, eating and drinking should be prohibited in the application area.

Advice on protection against fire and explosion

Normal measures for preventive fire protection.

Hygiene measures

General industrial hygiene practice.

Dust explosion class

Not applicable

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers

Electrical installations / working materials must comply with the technological safety standards.

Advice on common storage

No materials to be especially mentioned.

Storage class (TRGS 510)

10-13

Further information on storage stability

No decomposition if stored and applied as directed.

7.3 Specific end use(s)

No date available.

Section 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value
Triethyl citrate	Workers	Inhalation	Long-term systemic effects	73.5 mg/m ³
	Workers	Skin contact	Long-term systemic effects	20.8 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	28.8 mg/m ³
	Consumers	Skin contact	Long-term systemic effects	12.5 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	12.5 mg/kg bw/day

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Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
Triethyl citrate	Fresh water sediment	0.124 mg/kg dry weight (d.w.)
	Marine sediment	0.018 mg/kg dry weight (d.w.)
	Soil	0.049 mg/kg dry weight (d.w.)
	Oral (Secondary Poisoning)	222.22 mg/kg dry weight (d.w.)

8.2 Exposure controls

Personal protective equipment

Eye protection

Safety glasses

Hand protection

Remarks

Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work.

For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer.

Skin and body protection

Protective suit

Respiratory protection

No personal respiratory protective equipment normally required.

In the case of vapour formation use a respirator with an approved filter.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Colour	Colourless, light yellow, clear
Odour	Characteristic
Odour Threshold	Not relevant
Melting point/ range	-40 °C (1.013 hPa) Method: OECD Test Guideline 102
Boiling point/ boiling range	286.8 °C (1.013 hPa) Method: OECD Test Guideline 103
Flammability	No data available
Upper explosion limit/ Upper flammability limit :	No data available
Lower explosion limit/ Lower flammability limit :	No data available
Flash point	178 °C (1.017 hPa) Method: Regulation (EC) No. 440/2008, Annex, A.9
Auto-ignition temperature	No data available
Decomposition temperature	No decomposition if stored and applied as directed.
pH	Not applicable
Viscosity	
Viscosity, dynamic	35.2 mPa.s (25 °C) Method: Brookfield
Viscosity, kinematic	32.17 mm ² /s (20 °C) Method: OECD Test Guideline 114

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Solubility(ies)	58.1 g/l (20 °C)
Water solubility	pH: 3.4
	Method: OECD Test Guideline 105
Solubility in other solvents	Solvent: Alcohol
	Completely miscible
Partition coefficient: n-octanol/ water	log Pow: 1.17 (40 °C)
	Method: OECD Test Guideline 117
Vapour pressure	0.0025 hPa (25 °C)
	Calculation
Relative density	1.14 (20 °C, 1.013 hPa)
	Method: OECD Test Guideline 109
Density	1.1399 g/cm ³ (20 °C, 1.013 hPa)
	Method: OPPTS 830.7300
Relative vapour density	Not applicable
Particle characteristics	
Assessment	Assessment: This substance/ mixture does not contain nanoforms
Particle size	Not applicable
9.2 Other information	
Explosives	Not explosive
Oxidizing properties	No oxidising effect.
Flammable solids	
Burning number	Not applicable
Dust explosion class	Not applicable
Molecular weight	276.3 g/mol

Section 10: Stability and Reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions Stable under recommended storage conditions.
 No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid Continuous exposure to moist air

10.5 Incompatible materials

Materials to avoid Oxidizing agents

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

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Section 11: Toxicological Information

11.1 Toxicological effects:

Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Not classified based on available information.

Non-hazardous ingredients

Triethyl citrate

Acute oral toxicity

LD50 Oral (Rat): 3200 mg/kg body weight
 Test substance: Triethyl citrate

LD50 Oral (Cat): ca. 3500 ml/kg body weight
 Test substance: Triethyl citrate

Acute inhalation toxicity

LC50 (Rat): 1300 - 3500 ppm
 Exposure time: 6 h
 Test atmosphere: vapour
 Test substance: Triethyl citrate

Acute dermal toxicity

LD50 Dermal (Rabbit): > 5.000 mg/kg body weight
 Test substance: Triethyl citrate

Skin corrosion/ irritation

Not classified based on available information.

Non-hazardous ingredients

Triethyl citrate

Species	Rabbit
Exposure time	24 h
Method	OECD Test Guideline 404
Result	No skin irritation
Test substance	Tris(2-ethylhexyl) 2-(acetyloxy) propane-1,2,3-tricarboxylate
Remarks	Based on data from similar materials

Serious eye damage/ eye irritation

Not classified based on available information.

Non-hazardous ingredients

Triethyl citrate

Species	Rabbit
Exposure time	72 h
Method	OECD Test Guideline 405
Result	No eye irritation
Test substance	Tris(2-ethylhexyl) 2-(acetyloxy) propane-1,2,3-tricarboxylate
Remarks	Based on data from similar materials

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

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Respiratory sensitisation

Not classified based on available information.

Non-hazardous ingredients

Triethyl citrate

Test Type

Species

Method

Result

GLP

Maximisation Test

Guinea pig

OECD Test Guideline 406

Did not cause sensitisation on laboratory animals.

yes

Test substance

Remarks

Tris(2-ethylhexyl) 2-(acetyloxy) propane-1,2,3-tricarboxylate

Information given is based on data obtained from similar substances.

Germ cell mutagenicity

Not classified based on available information.

Non-hazardous ingredients

Triethyl citrate

Genotoxicity in vitro

Test Type: Ames test

Test system: Salmonella typhimurium

Concentration: 9 - 495 µg/plate

Method: OECD Test Guideline 471

Result: negative

Test substance: Tributyl O-acetyl citrate

Test Type: in-vitro Mouse Lymphoma Assay

Test system: mouse lymphoma cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

Test substance: Tributyl O-acetyl citrate

Genotoxicity in vivo

Test Type: Chromosomal aberration

Species: Rat

Application Route: Oral

Dose: 2000 mg/kg bw

Method: OECD Test Guideline 475

Result: negative

Test substance: Tributyl O-acetyl citrate

Carcinogenicity

Not classified based on available information.

Non-hazardous ingredients

Triethyl citrate

Species

Application Route

Exposure time

Dose

Result

Rat, male and female

Oral

2 y

ca. 1.5 mg/kg body weight

Animal testing did not show any carcinogenic effects.

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Test substance Triethyl citrate

Reproductive toxicity

Not classified based on available information.

Non-hazardous ingredients

Triethyl citrate

Effects on foetal development

Species: Rat
Application Route: Oral
General Toxicity Maternal: NOEL: 50 mg/kg bw/day
Developmental Toxicity: NOEL: 250 mg/kg bw/day
Tributyl O-acetyl citrate

STOT - single exposure

Not classified based on available information.

Components

Triethyl citrate

Remarks No data available

STOT - repeated exposure

Not classified based on available information.

Non-hazardous ingredients

Triethyl citrate

Remarks No data available

Repeated dose toxicity

Non-hazardous ingredients

Triethyl citrate

Species	Rat, male and female
NOAEL	≥ 1000 mg/kg bw/day
Application Route	Oral
Exposure time	13 w
Dose	0, 100, 300, 1000 mg/kg bw/day
Test substance	Tributyl O-acetyl citrate
Remarks	Information given is based on data obtained from similar substances.

Aspiration toxicity

Not classified based on available information.

Components

Triethyl citrate

No data available

11.2 Information on other hazards

Endocrine disrupting properties

Product

Assessment

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission

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Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product

Remarks No data available

Non-hazardous ingredients

Triethyl citrate

Remarks No data available

Section 12: Ecological Information

12.1 Toxicity

Non-hazardous ingredients

Triethyl citrate

Toxicity to fish

LC50 (Fish): ca. 112.02 mg/l
Exposure time: 96 h
Test substance: Triethyl citrate
Calculation

Toxicity to daphnia and other aquatic invertebrates

EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Triethyl citrate
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/ aquatic plants

EC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
GLP: yes
EC10: > 100 mg/l

Toxicity to microorganisms

No data available

Ecotoxicology Assessment

Acute aquatic toxicity

This product has no known ecotoxicological effects.

12.2 Persistence and degradability

Product

Biodegradability

Test Type: Primary biodegradation
Inoculum: activated sludge, non-adapted
Result: rapidly biodegradable
Biodegradation: 78 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
Test substance: Triethyl citrate
GLP: yes

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12.3 Bioaccumulative potential

Non-hazardous ingredients

Triethyl citrate

Bioaccumulation

Concentration: L/kg
Bioconcentration factor (BCF): 2.75
Method: The value is calculated

Partition coefficient: n-octanol/ water

log Pow: 1,17 (40 °C)
Method: OECD Test Guideline 117

12.4 Mobility in soil

Non-hazardous ingredients

Triethyl citrate

Mobility

Medium: Soil
The product will be dispersed amongst the various environmental compartments (soil/ water/ air).

Distribution among environmental Compartments

Adsorption/ Soil
Medium: Soil
Koc: 21.02, log Koc: 1.32
The value is calculated

Stability in soil

Readily biodegradable.

12.5 Results of PBT and vPvB assessment

Product

Assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Non-hazardous ingredients

Triethyl citrate

Assessment

This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Endocrine disrupting properties

Product

Assessment

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product

Additional ecological information

No data available

Non-hazardous ingredient

Triethyl citrate

Additional ecological information

No data available

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Section 13: Disposal considerations

13.1 Waste treatment methods

Product

In accordance with local and national regulations.

Do not dispose of waste into sewer.

According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.

Waste codes should be assigned by the user based on the application for which the product was used.

Contaminated packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal.

Section 14: Transport Information

14.1 UN number or ID number

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

Section 15: Regulatory Information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)

Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).

Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer

Not applicable

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Regulation (EU) 2019/1021 on persistent organic pollutants (recast)
 Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals
 Not applicable

REACH - List of substances subject to authorisation (Annex XIV)
 Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.
 Not applicable

Water hazard class (Germany)

WGK 1 slightly hazardous to water

Code Number: 5.227

Classification according to AwSV, Annex 1 (4)

TA Luft List (Germany)

Total dust:

Not applicable

Inorganic substances in powdered form:

Not applicable

Inorganic substances in vapour or gaseous form:

Not applicable

Organic Substances:

Not applicable

Carcinogenic substances:

Not applicable

Mutagenic:

Not applicable

Toxic to reproduction:

Not applicable

Volatile organic compounds

Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

Not applicable

The components of this product are reported in the following inventories

TCSI

On the inventory, or in compliance with the inventory

TSCA

All substances listed as active on the TSCA inventory

AIIC

On the inventory, or in compliance with the inventory

DSL

All components of this product are on the Canadian DSL

ENCS

On the inventory, or in compliance with the inventory

ISHL

On the inventory, or in compliance with the inventory

KECI

On the inventory, or in compliance with the inventory

PICCS

On the inventory, or in compliance with the inventory

IECSC

On the inventory, or in compliance with the inventory

NZIoC

On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

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Section 16: Other Information

Full text of other abbreviations

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways;
ADR	Agreement concerning the International Carriage of Dangerous Goods by Road;
AIIC	Australian Inventory of Industrial Chemicals;
ASTM	American Society for the Testing of Materials;
bw	Body weight;
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008;
CMR	Carcinogen, Mutagen or Reproductive Toxicant;
DIN	Standard of the German Institute for Standardisation;
DSL	Domestic Substances List (Canada);
ECHA	European Chemicals Agency;
EC- Number	European Community number;
ECx	Concentration associated with x% response;
ELx	Loading rate associated with x% response;
EmS	Emergency Schedule;
ENCS	Existing and New Chemical Substances (Japan);
ErCx	Concentration associated with x% growth rate response;
GHS	Globally Harmonized System;
GLP	Good Laboratory Practice;
IARC	International Agency for Research on Cancer;
IATA	International Air Transport Association;
IBC	International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk;
IC50	Half maximal inhibitory concentration;
ICAO	International Civil Aviation Organization;
IECSC	Inventory of Existing Chemical Substances in China;
IMDG	International Maritime Dangerous Goods;
IMO	International Maritime Organization;
ISHL	Industrial Safety and Health Law (Japan);
ISO	International Organisation for Standardization;
KECI	Korea Existing Chemicals Inventory;
LC50	Lethal Concentration to 50 % of a test population;
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose);
MARPOL	International Convention for the Prevention of Pollution from Ships;
n.o.s.	Not Otherwise Specified;
NO(A)EC	No Observed (Adverse) Effect Concentration;
NO(A)EL	No Observed (Adverse) Effect Level;
NOELR	No Observable Effect Loading Rate;
NZIoC	New Zealand Inventory of Chemicals;
OECD	Organization for Economic Co-operation and Development;
OPPTS	Office of Chemical Safety and Pollution Prevention;
PBT	Persistent, Bioaccumulative and Toxic substance;
PICCS	Philippines Inventory of Chemicals and Chemical Substances;
(Q)SAR	(Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals;
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail;

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SADT	Self-Accelerating Decomposition Temperature;
SDS	Safety Data Sheet;
SVHC	Substance of Very High Concern;
TCSI	Taiwan Chemical Substance Inventory;
TECI	Thailand Existing Chemicals Inventory;
TRGS	Technical Rule for Hazardous Substances;
TSCA	Toxic Substances Control Act (United States);
UN	United Nations;
vPvB	Very Persistent and Very Bioaccumulative

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text