SAFETY DATA SHEET（SDS）

According to Regulation (EC) No. 1907/07/2006 (REACH) and regulation (EU) No 453/2010

1. Product and Company Identification:

Synonyms: Tris(2-butoxyethyl) Ester Phosphoric acid, Tris(2-butoxyethyl) Phosphate,
2-butoxyethanol Phosphate, TBEP, KP-140
CAS No.: 78-51-3
Molecular Weight: 398.54
Chemical Formula: $C_{18}H_{39}O_7P$

Company Identification:
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2. Hazards Identification

2.1 GHS Classification

Classification according to EC regulation 1272/2008 (CLP)

This substance is classified as not hazardous.

Classification according to directive 67/548/EEC

This substance is classified as not hazardous.

2.2 GHS Label elements

Hazard statements: not applicable
Precautionary statements: not applicable

2.3 Other Hazards

In case of skin contact, inhalation, and oral: can damage your health.

3. Composition/ information on ingredients

Ingredient	CAS No	Percent
Tributoxy Ethyl Phosphate	78-51-3	97%
2-butoxyethanol	111-76-2	3%

4. First aid measures

4.1 Description of first aid measures

General information: If you feel unwell, seek medical advice. Never give anything by mouth to an unconscious person.

In case of inhalation: Provide fresh air. Seek medical treatment in case of troubles.

In case of skin contact: Take off immediately all contaminated clothing.
Wash with plenty of water. Seek medical attention.

In case of eye contact: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult anophthalmologist.

In case of swallowing: Rinse mouth and drink large quantities of water. Seek medical attenttion.

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5. Firefighting Measures

5.1 Extinguishing media

water fog, foam, extinguishing powder, carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Combustible. The vapours of the product are heavier than air.
In case of strong heating: vapours can form explosive mixtures with air.
In case of fire may be liberated; phosphorus oxides, carbon monoxide and carbon dioxide.

5.3 Advice for firefighters

Special protective equipment for firefighters: to avoid contact with skin, keep safety distance and wear suitable protective clothing.

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6. Accidental release measures:

6.1 Personal precautions, protective equipment and emergency procedures

Avoid contact with the substance, Wear protective equipment. Do not breathe
vapour/aerosol. Ensure adequate ventilation, especially in confined areas.

6.2 Environmental precautions

Do not allow to penetrate into soil, waterbodies or drains

6.3 Methods and material for containment and cleaning up

Soak up with absorbent materials such as san, siliceus earth, acid or univarsal
binder. Store in special closed containers and dispose of according to ordinance. Final cleaning.

6.4 Reference to other sections

Refer additionally to section 8 and 13.

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7. Handling and storage

7.1 Precautions for safe handling

Provide adequate ventilation, and local exhaust as needed.

Do not breathe vapour/aerosol. Avoid contact with skin and eyes.

Wear protective equipment. When using do not eat, drink or smoke.

Keep away from sources of ignition and heat.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a cool, well-ventilated place.

Keep away from heat sources, sparks and open flames. Protect from moistrure contamination.

Storage class: 10= combustible liquids, unless storage class 3

7.3 Specific end uses

No information available.

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8. Exposure controls/ personal protection

8.1 Control parameters

Occupational exposure limit values:

CAS No.	Designation	Type	Limit value
111-76-2	2-butoxyethanol	Europe: IOELV: STEL	246mg/m3; 50ppm (may be absorbed through skin)
		Europe: IOELV: TWA	98mg/m3; 20ppm

DNEL/DMEL:

DNEL Long-term, workers, inhalative: 3,5mg/33 (systemic)

DNEL Long-term, workers, dermal: 14mg/kg bw/d (systemic)

8.2 Exposure controls

Provide adequate ventilation, and local exhaust as needed.

Personal protection equipment

Respiratory protection: respiratory protection must br worn whenever the WEL levels have been exceeded. Use filter type A according to EN 14387.

Hand protection: Protective gloves according to E 374.

Glove material: butyl caoutchouc (butyl rubber)--Layer thickness: 0.7mm.

Breakthrough time: 480minnute min.

Observe glove manufacturer’s instructions concerning penetrability and breakthrough time.

Eye protection: Tightly sealed goggles according to EN 166.

Body protection: Wear suitable protective clothing.

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9. Physical and Chemical Properties:

Appearance: Colorless or Light yellow transparent liquid.

Solubility:

※ Water: Soluble

※ 95% Ethanol: Soluble
※ Acetone: Not available
Refractive Index: 1.432-1.437 @ 25℃
Fire Point: 252℃
Flash Point: 159℃ (1013hPa)
Boiling Point: 215℃ (1013hPa)
Density: 1.017-1.023
Flammability: no data available
Melting point: -70℃ (1013hPa)
Explosion limits: no data available
Vapour pressure: at 25℃: 0.0000152Pa
Vapour density: no data available
Viscosity: at 20℃: approx. 12.4 mPas
Oxidizing characteristics: no data available

10. Stability and reactivity

10.1 Reactivity: Refer to section 10.3
10.2 Chemical stablity: Product is stable under normal storage conditions
10.3 Possibility of hazardous reactions: in case of strong heating: vapours can form explosive mixtures with air.
10.4 Conditions to avoid: protect from excessive heat.
10.5 Incompatible materials: no data available.
10.6 Hazardous decompostion products: In case of fire may be liberated: phosphorus oxides, carbon monoxide and carbon dioxide.

11. Toxicological Information

Information on toxicological effects
Acute toxicity:
LD50 Rat, dermal: ＞2000 mg/kg
LD50 Rabbit dermal: ＞2000 mg/kg
LD50 Rat, inhalative: ＞6.4mg/L/4h
Symptoms
After contact with skin: mild irritant
After eye contact: mild irritant

12. Ecological information

12.1 Toxicity
Aquatic toxicity
EC50/LC50 Daphnia magna (big water flea): 50mg/L
Acute fish toxicity
LC50 Eisenis foetida: 544 mg/14 D (OECD207)

EC50/LC50 for aquatic organisms: 1000 mg/L
EC10/LC10 (NOEC) for aquatic organisms: 89.6mg/L

12.2 Persistence and degradability

Biodegradability: 87% - 28 d (OECD 301)
Product is readily biodegradable.
Photo-chemical elimination: half-life time in air: 0.083 d
Biodegradability in water: product is readily biodegradable.

12.3 Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.4 Mobility in soil

Koc at 20℃: 316
Henry constant at 20 ℃: 0.00000313 Pa m3/mol

13. Disposal considerations

Waste treatment methods

Product

Recommendation: Dispose of waste according to applicable legislation.

Contaminated packaging

Recommendation: Dispose of waste according to applicable legislation.

14. Transport information

14.1 UN number

ADR/RID, IMDG, IATA: not applicable

14.2 UN proper shipping name:

ADR/RID, IMDG, IATA: not restricted

14.3 Transport hazard class

ADR/RID, IMDG, IATA: not applicable

14.4 Packing group

ADR/RID, IMDG, IATA: not applicable

14.5 Environmental hazards

Marine pollutant: No

14.6 Special precautions for user

No dangerous good in sense of these transport regulations.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code

No data available

15. Regulatory information

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

Not applicable

15.2 Chemical safety assessment

For this substance a chemical safety assessment has been carried out.

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16. Other Information:

No available.