

1. IDENTIFICATION OF THE SUBSTRATE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Trade name/designation: Caltech Steel Primer - Part A.

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

Main use category: Primer.
Uses advised against: Not applicable.

1.3 Manufacturer/Supplier

Supplier:
Alumasc Building Products Ltd
White House Works, Bold Road, Sutton, St Helens, Merseyside, United Kingdom, WA9 4JG
Tel: +44 (0)1744 648400
e-mail: technical@alumascroofing.com

1.4 Manufacturer/Supplier

Emergency telephone: 01744 648 400 - (Mon-Thurs – 08.30-17.00 Fri – 08.30-16.00)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP] and amendments¹!

H336 - Specific target organ toxicity - single exposure Category 3 (narcotic effects), H411 - Chronic Aquatic Hazard Category 2, H225 - Flammable Liquid Category 2, H318 - Serious Eye Damage/Eye Irritation Category 1, H315 - Skin Corrosion/Irritation Category 2.

Legend:

1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 – Annex VI.

2.2 Labelling according to Regulation (EU) 1272/2008

Hazard pictures:



Signal word: Danger.

Hazard statements:
H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long lasting effects.
H225: Highly flammable liquid and vapour.
H318: Causes serious eye damage.
H315: Causes skin irritation.

Supplementary statements: Not applicable.

Precautionary statements - prevention:
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves, protective clothing, eye protection, face protection & hearing protection.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting] equipment.

P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing mist/vapours/spray.
P273: Avoid release to the environment.

Precautionary statements
- response:

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER/doctor.
P370+P378: In case of fire: Use alcohol resistant foam or normal protein foam to extinguish.
P391: Collect spillage.
P302+P352: IF ON SKIN: Wash with plenty of water and soap.
P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P332+P313: If skin irritation occurs: Get medical advice/attention.
P362+P364: Take off contaminated clothing and wash it before reuse.

Precautionary statements
- storage:

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

Precautionary statements
- disposal:

P501: Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

2.3 Other hazards

N-Butanol:
Phenol:
Methyl Ethyl Ketone:
Propylene Glycol Monomethyl Ether
- mixture of Isomers:
Isobutanol:

Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply).
Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply).
Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply).
Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply).
Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply).

3. COMPOSITION AND INFORMATION ABOUT THE COMPONENTS

3.1 Substances

Anti-corrosive steel primer.

3.1 Mixture

1.CAS No 2.EC No 3. Index No 4.REACH No	%[weight]	Name	Classification according to regulation (EC) No 1272/2008 [CLP] and amendments
1.71-36-3 2.200-751-6 3.603-004-00-6 4.01-2119484630-38-XXXX 01-2120076484-50-XXXX	30-60	N-Butanol	Flammable Liquid Category 3, Acute Toxicity (Oral) Category 4, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 1, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation); H226, H302, H336, H315, H318, H335 ^[2]
1.7779-90-0 2.231-944-3 3.030-011-00-6 4.01-2119485044-40-XXXX	5-10	Zinc Phosphate	Chronic Aquatic Hazard Category 1, Acute Aquatic Hazard Category 1; H410, H400 ^[2]
1.108-95-2 2.203-632-7 3.604-001-00-2 4.01-2119471329-32-XXXX 01-2120762102-67-XXXX	<1	Phenol*	Germ cell mutagenicity Category 2, Acute Toxicity (Dermal) Category 3, Skin Corrosion/Irritation Category 1B, Acute Toxicity (Oral) Category 3, Specific target organ toxicity - repeated exposure Category 2, Acute Toxicity (Inhalation) Category 3; H341, H311, H314, H301, H373 **, H331 ^[2]

1.1314-13-2 2.215-222-5 3.030-013-00-7 4.01-2119463881-32-XXXX 01-2120089607-43-XXXX 01-2119485288-24-XXX	<1	Zinc Oxide	Chronic Aquatic Hazard Category 1, Acute Aquatic Hazard Category 1; H410, H400 ^[2]
1.78093-3 2.201-159-0 3.606-002-00-3 4.01-2119457290-43-XXXX 01-2119943742-35-XXXX	10-30	Methyl Ethyl Ketone *	Flammable Liquid Category 2, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Eye Irritation Category 2; H225, H336, H319, EUH066 ^[2]
1.108-65-6 2.203-603-9 3.603-064-00-3 607-195-7 603-106-00-0 4.01-2119457435-35-XXXX 01-2119475791-29-XXXX	5-10	Propylene Glycol Monomethyl Ether - mixture of Isomers*	Flammable Liquid Category 3; H226 ^[2]
1.78-83-1 2.201-148-0 3.603-108-00-1 4.01-2119484609-23-XXXX	<1	Isobutanol	Specific target organ toxicity - single exposure Category 3 (narcotic effects), Flammable Liquid Category 3, Serious Eye Damage/Eye Irritation Category 1, Skin Corrosion/Irritation Category 2, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation); H336, H226, H318, H315, H335 ^[2]

Legend:

1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 3. Classification drawn from C&L; *EU IOELVs available.

4. FIRST AID MEASURES

4.1 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"> - Immediately flush body and clothes with large amounts of water, using safety shower if available. - Quickly 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:	<p>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.</p>
Ingestion:	<p>Immediately give a glass of water. First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor. If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.</p>

4.2 Most important symptoms and effects, both acute and delayed

See Section 11.

4.3 Indication of any immediate medical attention and special treatment needed

Any material aspirated during vomiting may produce lung injury. Therefore, emesis should not be induced mechanically or pharmacologically. Mechanical means should be used if it is considered necessary to evacuate the stomach contents; these include gastric lavage after endotracheal intubation. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

for phosphate salts intoxication:

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Ingestion of large quantities of phosphate salts (over 1.0 grams for an adult) may cause an osmotic catharsis resulting in diarrhoea and probable abdominal cramps. Larger doses such as 4-8 grams will almost certainly cause these effects in everyone. In healthy individuals most of the ingested salt will be excreted in the faeces with the diarrhoea and, thus not cause any systemic toxicity. Doses greater than 10 grams hypothetically may cause systemic toxicity.
- Treatment should take into consideration both anionic and cation portion of the molecule.
- All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcaemia, so calcium levels should be monitored.

To treat poisoning by the higher aliphatic alcohols (up to C7):

- Gastric lavage with copious amounts of water.
- It may be beneficial to instil 60 ml of mineral oil into the stomach.
- Oxygen and artificial respiration as needed.
- Electrolyte balance: it may be useful to start 500 ml. M/6 sodium bicarbonate intravenously but maintain a cautious and conservative attitude toward electrolyte replacement unless shock or severe acidosis threatens.
- To protect the liver, maintain carbohydrate intake by intravenous infusions of glucose.
- Haemodialysis if coma is deep and persistent. [GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products, Ed 5).

Basic treatment:

Establish a patent airway with suction where necessary.

Watch for signs of respiratory insufficiency and assist ventilation as necessary.

Administer oxygen by non-rebreather mask at 10 to 15 l/min.

Monitor and treat, where necessary, for shock.

Monitor and treat, where necessary, for pulmonary oedema

Anticipate and treat, where necessary, for seizures.

DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

Give activated charcoal.

Advanced treatment:

Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred. Positive-pressure ventilation using a bag-valve mask might be of use.

Monitor and treat, where necessary, for arrhythmias.

Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.

If the patient is hypoglycaemic (decreased or loss of consciousness, tachycardia, pallor, dilated pupils, diaphoresis and/or dextrose strip or glucometer readings below 50 mg), give 50% dextrose.

Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications. Drug therapy should be considered for pulmonary oedema.

Treat seizures with diazepam.

Proparacaine hydrochloride should be used to assist eye irrigation.

Emergency department:

Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.

Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome. Acidosis may respond to hyperventilation and bicarbonate therapy.

Haemodialysis might be considered in patients with severe intoxication.

Consult a toxicologist as necessary. BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994.

For C8 alcohols and above:

Symptomatic and supportive therapy is advised in managing patients.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Alcohol stable foam.
Dry chemical powder.
BCF (where regulations permit).

5.2 Special hazards arising from the substance or mixture

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

5.3 Advice for fire-fighters

Fire-fighters:

Alert Fire Brigade and tell them location and nature of hazard.
May be violently or explosively reactive.
Wear breathing apparatus plus protective gloves in the event of a fire.

Fire/explosion hazard:

Liquid and vapour are highly flammable.
Severe fire hazard when exposed to heat, flame and/or oxidisers.
Vapour may travel a considerable distance to source of ignition.
Combustion products include:
- carbon dioxide (CO₂).
- other pyrolysis products typical of burning organic material.

Contains low boiling substance:

Closed containers may rupture due to pressure build-up under fire conditions.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

See Section 8.

6.2 Environmental precautions

See Section 12.

6.3 Methods and materials for containment and cleaning up

Minor spills:

Slippery when spilt.
Remove all ignition sources.
Clean up all spills immediately.
Avoid breathing vapours and contact with skin and eyes.

Major spills:

Slippery when spilt.
Clear area of personnel and move upwind.
Alert Fire Brigade and tell them location and nature of hazard.
May be violently or explosively reactive.

6.4 Reference to other sections

See Section 8 for information on appropriate personal protective equipment.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Safe handling:

Containers, even those that have been emptied, may contain explosive vapours. Do NOT cut, drill, grind, weld or perform similar operations on or near containers.

Contains low boiling substance:

Storage in sealed containers may result in pressure build-up causing violent rupture of containers not rated appropriately.

- Check for bulging containers.
- Vent periodically.
- Always release caps or seals slowly to ensure slow dissipation of vapours.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- DO NOT allow clothing wet with material to stay in contact with skin.

Fire & explosion protection:

See Section 5.

Other information:

Store in original containers in approved flame-proof area.

No smoking, naked lights, heat or ignition sources.

DO NOT store in pits, depressions, basements or areas where vapours may be trapped.

7.2 Conditions for safe storage, including any incompatibilities

Suitable container:

Packing as supplied by manufacturer.

Plastic containers may only be used if approved for flammable liquid.

Check that containers are clearly labelled and free from leaks.

For low viscosity materials (i): Drums and jerry cans must be of the non-removable head type. (ii): Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt.

Storage incompatibility:

Methyl Ethyl Ketone:

- reacts violently with strong oxidisers, aldehydes, nitric acid, perchloric acid, potassium tert-butoxide, oleum.
- is incompatible with inorganic acids, aliphatic amines, ammonia, caustics, isocyanates, pyridines, chlorosulfonic acid.
- forms unstable peroxides in storage, or on contact with propanol or hydrogen peroxide.
- attacks some plastics.
- may generate electrostatic charges, due to low conductivity, on flow or agitation.

Alcohols:

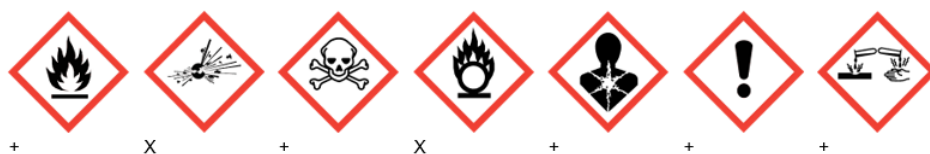
- are incompatible with strong acids, acid chlorides, acid anhydrides, oxidising and reducing agents.
- reacts, possibly violently, with alkaline metals and alkaline earth metals to produce hydrogen.
- react with strong acids, strong caustics, aliphatic amines, isocyanates, acetaldehyde, benzoyl peroxide, chromic acid, chromium oxide, dialkylzincs, dichlorine oxide, ethylene oxide, hypochlorous acid, isopropyl chlorocarbonate, lithium tetrahydroaluminate, nitrogen dioxide, pentafluoroguanidine, phosphorus halides, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutylaluminium.

- should not be heated above 49 deg. C. when in contact with aluminium equipment
Ketones in this group:

- are reactive with many acids and bases liberating heat and flammable gases (e.g. H₂).
- react with reducing agents such as hydrides, alkali metals, and nitrides to produce flammable gas (H₂) and heat.
- are incompatible with isocyanates, aldehydes, cyanides, peroxides, and anhydrides.

Propylene glycol monomethyl ether (PGME):

- reacts violently with strong oxidisers, alkalis.
- is incompatible with aliphatic amines, boranes, sulfuric acid, nitric acid, perchloric acid, caustics, isocyanates.



X: Must not be stored together.
O: May be stored together with specific preventions.
+: May be stored together.

7.3 Specific end use(s)

See Section 12.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Ingredient	DNELs Exposure pattern worker	PNECs Compartment
N-Butanol	Inhalation 310 mg/m ³ (Local, Chronic) Dermal 3.125 mg/kg bw/day (Systemic, Chronic) * Inhalation 55.357 mg/m ³ (Systemic, Chronic) * Oral 1.562 mg/kg bw/day (Systemic, Chronic) * Inhalation 155 mg/m ³ (Local, Chronic) *	0.082 mg/L (Water (Fresh)) 0.008 mg/L (Water - Intermittent release) 2.25 mg/L (Water (Marine)) 0.324 mg/kg sediment dw (Sediment (Fresh Water)) 0.032 mg/kg sediment dw (Sediment (Marine)) 0.017 mg/kg soil dw (Soil) 2476 mg/L (STP)
Zinc Phosphate	Dermal 83 mg/kg bw/day (Systemic, Chronic) Inhalation 5 mg/m ³ (Systemic, Chronic) Dermal 83 mg/kg bw/day (Systemic, Chronic) * Inhalation 2.5 mg/m ³ (Systemic, Chronic) * Oral 0.83 mg/kg bw/day (Systemic, Chronic) *	20.6 µg/L (Water (Fresh)) 6.1 µg/L (Water - Intermittent release) 117.8 mg/kg sediment dw (Sediment (Fresh Water)) 56.5 mg/kg sediment dw (Sediment (Marine)) 35.6 mg/kg soil dw (Soil) 100 µg/L (STP)
Phenol	Dermal 1.23 mg/kg bw/day (Systemic, Chronic) Inhalation 8 mg/m ³ (Systemic, Chronic) Inhalation 16 mg/m ³ (Local, Acute) Dermal 0.4 mg/kg bw/day (Systemic, Chronic) * Inhalation 1.32 mg/m ³ (Systemic, Chronic) * Oral 0.4 mg/kg bw/day (Systemic, Chronic) *	0.008 mg/L (Water (Fresh)) 0.001 mg/L (Water - Intermittent release) 0.031 mg/L (Water (Marine)) 0.091 mg/kg sediment dw (Sediment (Fresh Water)) 0.009 mg/kg sediment dw (Sediment (Marine)) 0.136 mg/kg soil dw (Soil) 2.1 mg/L (STP)
Zinc Oxide	Dermal 83 mg/kg bw/day (Systemic, Chronic) Inhalation 5 mg/m ³ (Systemic, Chronic) Inhalation 0.5 mg/m ³ (Local, Chronic) Dermal 83 mg/kg bw/day (Systemic, Chronic) * Inhalation 2.5 mg/m ³ (Systemic, Chronic) * Oral 0.83 mg/kg bw/day (Systemic, Chronic) *	0.19 µg/L (Water (Fresh)) 1.14 µg/L (Water - Intermittent release) 1.2 µg/L (Water (Marine)) 18 mg/kg sediment dw (Sediment (Fresh Water)) 6.4 mg/kg sediment dw (Sediment (Marine)) 0.7 mg/kg soil dw (Soil) 20 µg/L (STP) 0.16 mg/kg food (Oral)
Methyl Ethyl Ketone	Dermal 1 161 mg/kg bw/day (Systemic, Chronic) Inhalation 600 mg/m ³ (Systemic, Chronic) Dermal 412 mg/kg bw/day (Systemic, Chronic) * Inhalation 106 mg/m ³ (Systemic, Chronic) * Oral 31 mg/kg bw/day (Systemic, Chronic) *	55.8 mg/L (Water (Fresh)) 55.8 mg/L (Water - Intermittent release) 55.8 mg/L (Water (Marine)) 284.74 mg/kg sediment dw (Sediment (Fresh Water)) 284.7 mg/kg sediment dw (Sediment (Marine)) 22.5 mg/kg soil dw (Soil) 709 mg/L (STP) 1000 mg/kg food (Oral)
Propylene Glycol Monomethyl Ether - mixture of Isomers	Dermal 183 mg/kg bw/day (Systemic, Chronic) Inhalation 275 mg/m ³ (Systemic, Chronic) Inhalation 553.5 mg/m ³ (Systemic, Acute) Inhalation 550 mg/m ³ (Local, Acute) Dermal 78 mg/kg bw/day (Systemic, Chronic) * Inhalation 33 mg/m ³ (Systemic, Chronic) * Oral 33 mg/kg bw/day (Systemic, Chronic) * Inhalation 33 mg/m ³ (Local, Chronic) *	0.635 mg/L (Water (Fresh)) 0.064 mg/L (Water - Intermittent release) 6.35 mg/L (Water (Marine)) 3.29 mg/kg sediment dw (Sediment (Fresh Water)) 0.329 mg/kg sediment dw (Sediment (Marine)) 0.29 mg/kg soil dw (Soil) 100 mg/L (STP)

Isobutanol	Inhalation 310 mg/m ³ (Local, Chronic) Inhalation 55 mg/m ³ (Local, Chronic) *	0.4 mg/L (Water (Fresh)) 0.04 mg/L (Water - Intermittent release) 11 mg/L (Water (Marine)) 1.56 mg/kg sediment dw (Sediment (Fresh Water)) 0.156 mg/kg sediment dw (Sediment (Marine)) 0.076 mg/kg soil dw (Soil) 10 mg/L (STP)
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* Values for general population.

Occupational Exposure Limits (OEL):

INGREDIENT DATA						
Source	Ingredient	Material name	TWA	STEL	Peak	Notes
UK Workplace Exposure Limits (WELs)	N-Butanol	Butan-1-Ol	Not available	154 mg/m ³ / 50 ppm	Not available	Sk
UK Workplace Exposure Limits (WELs)	Phenol	Phenol	2 ppm / 7.8 mg/m ³	16 mg/m ³ / 4 ppm	Not available	Sk
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	Phenol	Phenol	2 ppm / 8 mg/m ³	16 mg/m ³ / 4 ppm	Not available	Skin
UK Workplace Exposure Limits (WELs)	Methyl Ethyl Ketone	Butan-2-One (Methyl Ethyl Ketone)	200 ppm / 600 mg/m ³	899 mg/m ³ / 300 ppm	Not available	Sk, BMGV
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	Methyl Ethyl Ketone	Butanone	200 ppm / 600 mg/m ³	900 mg/m ³ / 300 ppm	Not available	Not available
UK Workplace Exposure Limits (WELs)	Propylene Glycol Monomethyl Ether -	1-Methoxypropan-2-Ol	100 ppm / 375 mg/m ³	560 mg/m ³ / 150 ppm	Not available	Sk
UK Workplace Exposure Limits (WELs)	Propylene Glycol Monomethyl Ether -	1-Methoxypropyl Acetate	50 ppm / 274 mg/m ³	548 mg/m ³ / 100 ppm	Not available	Sk
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	Propylene Glycol Monomethyl Ether - mixture of Isomers	1-Methoxypropyl-2-Acetate	50 ppm / 275 mg/m ³	550 mg/m ³ / 100 ppm	Not available	Skin
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	Propylene Glycol Monomethyl Ether - mixture of Isomers	1-Methoxypropan-2-Ol	100 ppm / 375 mg/m ³	568 mg/m ³ / 150 ppm	Not available	Skin
UK Workplace Exposure Limits (WELs)	Isobutanol	2-Methylpropan-1-Ol	50 ppm / 154 mg/m ³	231 mg/m ³ / 75 ppm	Not available	Not available

EMERGENCY LIMITS			
Ingredient	TEEL-1	TEEL-2	TEEL-3
N-Butanol	60 ppm	800 ppm	8000** ppm
Zinc Phosphate	12 mg/m ³	36 mg/m ³	220 mg/m ³
Phenol	Not available	Not available	Not available
Zinc Oxide	10 mg/m ³	15 mg/m ³	2,500 mg/m ³
Methyl Ethyl Ketone	Not available	Not available	Not available
Propylene Glycol Monomethyl Ether - mixture of Isomers	100 ppm	160 ppm	660 ppm

Ingredient	TEEL-1	TEEL-2	TEEL-3
Propylene Glycol Monomethyl Ether - mixture of Isomers	Not available	Not available	Not available
Isobutanol	150 ppm	1,300 ppm	8000* ppm

Ingredient	Original IDLH	Revised IDLH
N-Butanol	1,400 ppm	Not available
Zinc Phosphate	Not available	Not available
Phenol	250 ppm	Not available
Zinc Oxide	500 mg/m ³	Not available

Our company policy is one of continuous research and development; we therefore reserve the right to amend content herein without prior notice.

Methyl Ethyl Ketone	3,000 ppm	Not available
Propylene Glycol Monomethyl Ether - mixture of Isomers	Not available	Not available
Isobutanol	1,600 ppm	Not available

OCCUPATIONAL EXPOSURE BANDING		
Ingredient	Occupational exposure band rating	Occupational exposure band limit
Zinc Oxide	E	≤ 0.01 mg/m ³
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.	

8.2 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.

Personal protection:



Eye and face protection:

Safety glasses with side shields.
Chemical goggles.
Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.

Skin protection:

See hand protection below.

Hands/feet protection:

Wear chemical protective gloves, e.g. PVC.
Wear safety footwear or safety gumboots, e.g. rubber.
The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Body protection:

See other protection below.

Other protection overalls:

PVC apron.
PVC protective suit may be required if exposure severe.
Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets). Non sparking safety or conductive footwear should be considered.

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: Caltech Steel Primer - Part A.

Material	CPI
BUTYL	C
BUTYL/NEOPRENE	C
HYPALON	C
NAT+NEOPR+NITRILE	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
NITRILE+PVC	C
PE	C
PE/EVAL/PE	C
PVA	C
PVC	C
SARANEX-23	C
TEFLON	C
VITON	C
VITON/NEOPRENE	C

Respiratory protection:

Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent). Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.

Wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate. Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used.

*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

Environmental exposure controls:

See Section 12.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Buff		
Physical state	Liquid	Relative density (Water = 1)	0.9-1.1
Odour	Characteristic	Partition coefficient n-octanol / water	Not available
Odour threshold	Not available	Auto-ignition temperature (°C)	Not available
pH (as supplied)	Not available	Decomposition temperature	Not available
Melting point / freezing point (°C)	Not available	Viscosity (cSt)	Not available
Initial boiling point and boiling range (°C)	Not available	Molecular weight (g/mol)	Not available
Flash point (°C)	<21	Taste	Not available
Evaporation rate	Not available	Explosive properties	Not available
Flammability	HIGHLY FLAMMABLE	Oxidising properties	Not available

Our company policy is one of continuous research and development; we therefore reserve the right to amend content herein without prior notice.

Upper explosive limit (%)	Not available	Surface Tension (dyn/cm or mN/m)	Not available
Lower explosive limit (%)	Not available	Volatile component (%vol)	Not available
Vapour pressure (kPa)	Not available	Gas group	Not available
Solubility in water	Immiscible	pH as a solution (1%)	Not available
Vapour density (Air = 1)	Not available	VOC g/L	Not available

9.2 Other information

Not available.

10. STABILITY AND REACTIVITY

10.1 Reactivity

See Section 7.2.

10.2 Chemical stability

Unstable in the presence of incompatible materials.
Product is considered stable.
Hazardous polymerisation will not occur.

10.3 Possibility of hazardous reactions

See Section 7.2.

10.4 Conditions to avoid

See Section 7.2.

10.5 Incompatible materials

See Section 7.2.

10.6 Hazardous decomposition products

See Section 7.2.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Inhaled:

There is strong evidence to suggest that this material can cause, if inhaled once, very serious, irreversible damage of organs.

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

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.

Exposure to n-butanol causes dose dependent irritation and headaches in humans, but CNS depression and prostration in mice. Though the offensive odour may forewarn, the smell sense may become fatigued.

Aliphatic alcohols with more than 3-carbons cause headache, dizziness, drowsiness, muscle weakness and delirium, central depression, coma, seizures and behavioural changes. Secondary respiratory depression and failure, as well as low blood pressure and irregular heart rhythms, may follow.

Isobutanol appears to be more toxic than n-butyl alcohol. It may result in narcosis and death.

PGME has an offensive odour, and may cause drowsiness and unconsciousness if higher concentrations are inhaled, and severe reactions involving the eyes, nose and throat.

Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and in-coordination.

Acute exposure of humans to high concentrations of methyl ethyl ketone produces irritation to the eyes, nose and throat. Acute exposure by inhalation also causes nervous system depression, headache, and nausea. High vapour levels are easily detected due to odour, however odour fatigue may occur, with loss of warning of exposure. Ketone vapours irritate the nose, throat and mucous membrane. High concentrations depress the central nervous system, causing headache, vertigo, poor concentration, sleep and failure of the heart and breathing.

Ingestion: There is strong evidence to suggest that this material can cause, if swallowed once, very serious, irreversible damage of organs. Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and inco-ordination, giddiness, confusion, delirium and coma. Following a single dose of isobutanol in rats, deaths were delayed for several days and hepatic degeneration was evident. Swallowing of n-butanol may cause breathing difficulties, headache, nausea, vomiting, irritation of the airway and mucous membranes as well as depression of the central nervous system. The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. (ICSC13733).

Skin contact: There is strong evidence to suggest that this material, on a single contact with skin, can cause very serious, irreversible damage of organs. The material may accentuate any pre-existing dermatitis condition. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Application of isobutanol to human skin produced slight redness and blood congestion. In humans exposed to methyl ethyl ketone, skin inflammation has been reported. Animal testing has shown methyl ethyl ketone to have high acute toxicity from skin exposure. Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man. Harmful amounts of PGME may be absorbed through the skin following extensive prolonged contact; this may result in drowsiness, unconsciousness and depression. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream, through for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

Eye: If applied to the eyes, this material causes severe eye damage. Instillation of isobutanol into the eye may cause moderate to severe irritation but no permanent injury to the cornea. N-butanol can cause eye damage, burning sensation, blurring of vision, excessive tear formation and discomfort to bright light. The vapour when concentrated has pronounced eye irritation effects and this gives some warning of high vapour concentrations. If eye irritation occurs seek to reduce exposure with available control measures or evacuate area.

Chronic: Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility. Oral exposure of rats to isobutanol caused cancers of the gullet and stomach, liver or blood (myelogenous leukaemia). Abnormal non-cancer growths were also more common in those animals exposed to isobutanol. Hearing and balance loss have been reported with exposure to n-butanol, especially with concomitant long term unprotected exposure to high noise. Animal testing shows that methyl ethyl ketone may have slight effects on the nervous system, liver, kidney and respiratory system; there may also be developmental effects and an increase in birth defects. However, there is limited information available on the long-term effects of methyl ethyl ketone in humans, and no information is available on whether it causes developmental or reproductive toxicity or cancer. It is generally considered to have low toxicity, but

it is often used in combination with other solvents, and the toxic effects of the mixture may be greater than with either solvent alone.

When taken repeatedly, PGME may cause damage to liver and kidney, drowsiness and even unconsciousness and death. There is no evidence of damage to the sex organs. However, it has led to multiple pregnancies in rats and rabbits, but sperm destruction in dogs.

Welding or flame cutting of metals with zinc or zinc dust coatings may result in inhalation of zinc oxide fume; high concentrations of zinc oxide fume may result in "metal fume fever"; also known as "brass chills", an industrial disease of short duration. [I.L.O] Symptoms include malaise, fever, weakness, nausea and may appear quickly if operations occur in enclosed or poorly ventilated areas.

Caltech Steel Primer – Part A:

Toxicity	Irritation
Not available	Not available

N-Butanol:

Toxicity	Irritation
Dermal (rabbit) LD50: 5.235 mg/kg ^[1]	Eye (human): 50 ppm - irritant
Inhalation (rat) LC50; >17.76 mg/l ^[2]	Eye (rabbit): 1.6 mg - SEVERE
Oral (rat) LD50; 3.494 mg/kg ^[1]	Eye (rabbit): 24 mg/24h - SEVERE
	Eye: adverse effect observed (irreversible damage) ^[1]
	Skin (rabbit): 405 mg/24h - moderate
	Skin: adverse effect observed (irritating) ^[1]

Zinc Phosphate:

Toxicity	Irritation
Oral (rat) LD50; >5000 mg/kg ^[2]	Eye: no adverse effect observed (not irritating) ^[1]
	Skin: no adverse effect observed (not irritating) ^[1]

Phenol:

Toxicity	Irritation
Dermal (rat) LD50: 0.59 mg/kg ^[1]	Eye (rabbit): 100 mg rinse - mild
Inhalation (mouse) LC50; 0.177 mg/l ^[2]	Eye (rabbit): 5 mg - SEVERE
Oral (mouse) LD50; 270 mg/kg ^[2]	Skin (rabbit): 500 mg open - SEVERE
	Skin (rabbit): 500 mg/24hr - SEVERE

Zinc Oxide:

Toxicity	Irritation
Dermal (rat) LD50: >2000 mg/kg ^[1]	Eye (rabbit): 500 mg/24h - mild
Inhalation (rat) LC50; >1.79 mg/l ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
Oral (rat) LD50; >5000 mg/kg ^[1]	Skin (rabbit): 500 mg/24h – mild
	Skin: no adverse effect observed (not irritating) ^[1]

Methyl Ethyl Ketone:

Toxicity	Irritation
dermal (rat) LD50: >2000 mg/kg ^[1]	Eye (rabbit) 230 mg - mild
Oral (rat) LD50; 5155 mg/kg ^[1]	Eye (rabbit) 500 mg/24h - mild
	Eye: no adverse effect observed (not irritating) ^[1]
	Skin (rabbit) 500 mg open - mild
	Skin: no adverse effect observed (not irritating) ^[1]

Propylene Glycol Monomethyl Ether – mixture of Isomers:

Toxicity	Irritation
dermal (rat) LD50: >2000 mg/kg ^[1]	Eye (rabbit) 230 mg - mild
Oral (rat) LD50; 5155 mg/kg ^[1]	Eye (rabbit) 500 mg/24h - mild
	Eye: no adverse effect observed (not irritating) ^[1]
	Skin (rabbit) 500 mg open - mild
	Skin: no adverse effect observed (not irritating) ^[1]

Isobutanol:

Toxicity	Irritation
Dermal (rabbit) LD50: >2000 mg/kg ^[2]	Eye (rabbit): 2 20 mg/24h - moderate
Inhalation (rabbit) LC50; 2.63 mg/L4 ^[2]	Eye (rabbit): 2 mg/24h - SEVERE
Oral (rat) LD50; >2830 mg/kg ^[2]	Skin (rabbit): mg (open) - SEVERE

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.

N-Butanol:	Acute toxicity: In animal testing, n-butanol (BA) was only slightly toxic, following exposure by swallowing, skin contact or irritation. Animal testing and human experience suggest that n-butanol is moderately irritating to the skin but severely irritating to the eye. Human studies show that BA is not likely to cause skin sensitization.
Phenol:	The material may cause severe 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. Repeated exposures may produce severe ulceration. The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
Propylene Glycol Monomethyl Ether - mixture of Isomers:	NOTE: Exposure of pregnant rats and rabbits to the substance did not give rise to teratogenic effects at concentrations up to 3000 ppm. Fetotoxic effects were seen in rats but not in rabbits at this concentration; maternal toxicity was noted in both species. No significant acute toxicological data identified in literature search. The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
Caltech Steel Primer - Part A & Propylene Glycol Monomethyl Ether - mixture of Isomers	For propylene glycol ethers (PGEs): Typical propylene glycol ethers include propylene glycol n-butyl ether (PnB); dipropylene glycol n-butyl ether (DPnB); dipropylene glycol methyl ether acetate (DPMA) and tripropylene glycol methyl ether (TPM). Testing of a wide variety of propylene glycol ethers has shown that propylene glycol-based ethers are less toxic than some ethers of the ethylene series. The common toxicities associated with the lower molecular weight homologues of the ethylene series, such as adverse effects on the reproductive organs, the developing embryo and foetus, blood or thymus gland, are not seen with the commercial-grade propylene glycol ethers. In the ethylene series, metabolism of the terminal hydroxyl group produces and alkoxyacetic acid.
Caltech Steel Primer – Part A & Methyl Ethyl Ketone	Methyl ethyl ketone is considered to have a low order of toxicity; however, methyl ethyl ketone is often used in combination with other solvents and the mixture may have greater toxicity than either solvent alone. Combinations of n-hexane with methyl ethyl ketone, and also methyl n-butyl ketone with methyl ethyl ketone may result in an increased in peripheral neuropathy, a progressive disorder of the nerves of the extremities. Combinations with chloroform also show an increase in toxicity.
N-Butanol & Phenol & Methyl Ethyl Ketone & Propylene Glycol Monomethyl Ether - mixture of Isomers & Isobutanol	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant.
N-Butanol & Phenol & Isobutanol	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

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.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Caltech Steel Primer – Part A:

End point	Test duration (hr)	Species	Value	Source
Not available	Not available	Not available	Not available	Not available

N-Butanol:

End point	Test duration (hr)	Species	Value	Source
EC50	96	Algae or other aquatic	225mg/l	2
NOEC (ECx)	504	Crustacea	4.1mg/l	2
EC50	48	Crustacea	>500mg/l	1
LC50	96	Fish	100500mg/l	4
EC50	72	Algae or other aquatic	>500mg/l	1

Zinc Phosphate:

End point	Test duration (hr)	Species	Value	Source
EC50	48	Crustacea	>1.08mg/l	2
EC50 (ECx)	24	Crustacea	0.22mg/l	2

Phenol:

End point	Test duration (hr)	Species	Value	Source
NOEC (ECx)	72	Fish	0.012mg/L	4
EC50	72	Algae or other aquatic	48.93757.407mg/L	4
EC50	96	Algae or other aquatic	0.038mg/L	4
LC50	96	Fish	0.010.02mg/L	4
EC50	48	Crustacea	3.1mg/l	1

Zinc Oxide:

End point	Test duration (hr)	Species	Value	Source
EC50	48	Crustacea	0.3010.667mg/l	4
BCF	1344	Fish	19110	7
LC50	96	Fish	0.0020.008mg/L	4
EC50	72	Algae or other aquatic	0.0360.049mg/l	4
NOEC (ECx)	72	Algae or other aquatic	0.005mg/l	2
EC50	96	Algae or other aquatic	0.3mg/l	2

Methyl Ethyl Ketone:

End point	Test duration (hr)	Species	Value	Source
NOEC (ECx)	96	Fish	1.18mg/L	4
LC50	96	Fish	>1.18mg/L	4
EC50	48	Crustacea	308mg/l	2
EC50	72	Algae or other aquatic	1972mg/l	2
EC50	96	Algae or other aquatic	>500mg/l	4

Propylene Glycol Monomethyl Ether – mixture of isomers:

End point	Test duration (hr)	Species	Value	Source
LC50	96	Fish	>100mg/l	2
EC50	48	Crustacea	373mg/l	2
NOEC (ECx)	336	Fish	47.5mg/l	2
EC50	72	Algae or other aquatic	>1000mg/l	2
EC50	96	Algae or other aquatic	>1000mg/l	2

Isobutanol:

End point	Test duration (hr)	Species	Value	Source
NOEC (ECx)	504	Crustacea	4mg/L	5
LC50	96	Fish	1328.18mg/L	4
EC50	48	Crustacea	ca.600mg/l	1
EC50	72	Algae or other aquatic	593mg/l	2

Legend:

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 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.

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.

For Propylene Glycol Ethers: log Kow's range from 0.309 for TPM to 1.523 for DPnB. Calculated BCFs range from 1.47 for DPnB to 3.16 for DPMA and TPM, indicating low bioaccumulation. Henry's Law Constants are low for all category members, ranging from 5.7 x 10⁻⁹ atm-m³/mole for TPM to 2.7 x10⁻⁹ atm-m³/mole for PnB.

For Methyl Ethyl Ketone: log Kow: 0.26-0.69;

log Koc: 0.69;

Koc: 34;

Half-life (hr) air: 2.3;

Half-life (hr) H₂O surface water: 72-288; Henry's atm m³ /mol: 1.05E-05;

BOD 5: 1.5-2.24, 46%;

COD: 2.2-2.31, 100%;

ThOD: 2.44;

BCF: 1.

Environmental Fate: Terrestrial Fate - Measured Koc values of 29 and 34 were obtained for methyl ethyl ketone in silt loams. Methyl ethyl ketone is expected to have very high mobility in soil.

For Ketones: Ketones, unless they are alpha, beta--unsaturated ketones, can be considered as narcosis or baseline toxicity compounds.

Aquatic Fate: Hydrolysis of ketones in water is thermodynamically favourable only for low molecular weight ketones. Reactions with water are reversible with no permanent change in the structure of the ketone substrate.

For Zinc and its Compounds: BCF: 4 to 24,000.

Environmental Fate: Zinc is capable of forming complexes with a variety of organic and inorganic groups and is an essential nutrient present in all organisms. Atmospheric Fate: Zinc concentrations in the air are relatively low, except near industrial sources, such as smelters.

DO NOT discharge into sewer or waterways

12.2 Persistence & degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
N-Butanol	LOW (Half-life = 54 days)	LOW (Half-life = 3.65 days)
Phenol	LOW (Half-life = 10 days)	LOW (Half-life = 0.95 days)
Methyl Ethyl Ketone	LOW (Half-life = 14 days)	LOW (Half-life = 26.75 days)
Propylene Glycol Monomethyl Ether - mixture of Isomers	LOW (Half-life = 56 days)	LOW (Half-life = 1.7 days)
Isobutanol	LOW (Half-life = 14.42 days)	LOW (Half-life = 4.15 days)

12.3 Bioaccumulative potential

Ingredient	Bioaccumulation
N-Butanol	LOW (BCF = 0.64)
Phenol	LOW (BCF = 17.5)
Zinc Oxide	LOW (BCF = 217)
Methyl Ethyl Ketone	LOW (LogKOW = 0.29)
Propylene Glycol Monomethyl Ether - mixture of Isomers	LOW (BCF = 2)
Isobutanol	LOW (LogKOW = 0.76)

12.4 Mobility in soil

Ingredient	Mobility
N-Butanol	MEDIUM (KOC = 2.443)
Phenol	LOW (KOC = 268)
Methyl Ethyl Ketone	MEDIUM (KOC = 3.827)

Propylene Glycol Monomethyl Ether - mixture of Isomers	HIGH (KOC = 1)
Isobutanol	MEDIUM (KOC = 2.048)

12.5 Results of PBT and vPvB assessment

Not applicable.

12.6 Other adverse effects

No data available.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product/packaging disposal: Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

- 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. Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material).

Waste treatment option: Not available.

Sewage disposal options: Not available.

14. TRANSPORT INFORMATION

Labels required:



Danger



Marine pollutant

HAZCHEM:

•3YE

Land transport (ADR-RID):

14.1. UN number

1263

14.2. UN proper shipping name

Paint or paint related material

14.3. Transport hazard class(es)

Class: 3
Subrisk: Not applicable

14.4. Packing group

II.

14.5. Environmental hazard

Environmentally hazardous.

14.6. Special precautions for user

Hazard identification (Kemler): 33
Classification code: F1
Hazard label: 3
Special provision: 1 63 367 640C 640D 650
Limited quantity: 5 L
Tunnel restriction code: 2 (D/E)

Land transport (ICAO-IATA /DGR):

14.1. UN number	1263	
14.2. UN proper shipping name	Paint (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base).	
14.3. Transport hazard class(es)	ICAO/IATA Class:	3
	ICAO/IATA Subrisk:	Not applicable
	ERG Code:	3L
14.4. Packing group	II	
14.5. Environmental hazard	Environmentally hazardous	
14.6. Special precautions for user	Special provisions:	A3 A72 A192
	Cargo only packing instructions:	364
	Cargo only maximum qty / pack:	60 L
	Passenger and cargo packing instructions:	353
	Passenger and cargo maximum qty / pack:	5 L
	Passenger and cargo limited quantity packing instructions:	Y341
	Passenger and Cargo Limited Maximum qty / pack	1 L

Sea transport (IMDG-Code / GGV See)

14.1. UN number	1263	
14.2. UN proper shipping name	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning or reducing compound).	
14.3. Transport hazard class(es)	IMDG Class:	3
	IMDG Subrisk:	Not applicable
14.4. Packing group	II.	
14.5. Environmental hazard	Marine pollutant.	
14.6. Special precautions for user	EMS Number	F-F, S-E
	Special provision:	163 367
	Limited quantities:	5 L

Inland waterways transport (AND):

14.1. UN number	1263	
14.2. UN proper shipping name	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound).	
14.3. Transport hazard class(es)	Class:	3
	Subrisk:	Not applicable
14.4. Packing group	II	
14.5. Environmental hazard	Environmentally hazardous	
14.6. Special precautions for user	Classification code:	F1
	Special provision:	163; 367; 640C; 640D; 650
	Limited quantity:	5 L
	Equipment required:	PP, EX, A
	Fire cones number:	1

14.7 Special precautions for user

Not applicable.

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

Product name	Group
N-Butanol	Not available
Zinc Phosphate	Not available
Phenol	Not available
Zinc Oxide	Not available
Methyl Ethyl Ketone	Not available
Propylene Glycol Monomethyl Ether - mixture of Isomers	Not available
Isobutanol	Not available

14.9 Transport in bulk in accordance with the ICG Code

Product name	Ship type
N-Butanol	Not available
Zinc Phosphate	Not available
Phenol	Not available
Zinc Oxide	Not available
Methyl Ethyl Ketone	Not available
Propylene Glycol Monomethyl Ether - mixture of Isomers	Not available
Isobutanol	Not available

15. REGULATORY INFORMATION

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

N-Butanol is found on the following regulatory lists:

EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances.
EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.
UK Workplace Exposure Limits (WELs).

Zinc Phosphate is found on the following regulatory:

EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances.
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.

Phenol is found on the following regulatory lists:

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs).
EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances.
EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs.
UK Workplace Exposure Limits (WELs).

Zinc Oxide is found on the following regulatory:

EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances.
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.

Methyl Ethyl Ketone is found on the following regulatory lists:

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs).
EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances.
EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.
UK Workplace Exposure Limits (WELs).

Propylene Glycol Monomethyl Ether – mixture of Isomers is found on the following regulatory lists:

Chemical Footprint Project - Chemicals of High Concern List.
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs).
EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.
EU REACH Regulation (EC) No 1907/2006 - Annex XVII (Appendix 6) Toxic to reproduction: category 1B (Table 3.1)/category 2 (Table 3.2).
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.
UK Workplace Exposure Limits (WELs).

Isobutanol is found on the following regulatory lists:

EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.
UK Workplace Exposure Limits (WELs).

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable:
Directives 98/24/EC, - 92/85/EEC, - 94/33/EC, - 2008/98/EC, - 2010/75/EU;
Commission Regulation (EU) 2020/878;
Regulation (EC) No 1272/2008 as updated through ATPs.

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

National inventory status:

National Inventory	Status
Australia - AIIIC / Australia Non-Industrial Use:	Yes
Canada – DSL:	Yes
Canada – NDSL:	No (N-Butanol; Phenol; Methyl Ethyl Ketone; Isobutanol)
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:	No (Zinc Phosphate)
Vietnam – NCI:	Yes
Russia – ARIPS:	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 and are not exempt from listing (see specific ingredients in brackets).

16. OTHER INFORMATION

Full text risk and hazard code:

H226: Flammable liquid and vapour.
H301: Toxic if swallowed.
H302: Harmful if swallowed.
H311: Toxic in contact with skin.
H314: Causes severe skin burns and eye damage.
H319: Causes serious eye irritation.
H331: Toxic if inhaled.

H335:	May cause respiratory irritation.
H341:	Suspected of causing genetic defects.
H373:	May cause damage to organs through prolonged or repeated exposure.
H400:	Very toxic to aquatic life.
H410:	Very toxic to aquatic life with long lasting effects.

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 Exposure Scenarios.

For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:

EN 166:	Personal eye-protection.
EN 340:	Protective clothing.
EN 374:	Protective gloves against chemicals and micro-organisms
EN 13832:	Footwear protecting against chemicals.
EN 133:	Respiratory protective devices.

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
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.

DISCLAIMER OF LIABILITY The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

1. IDENTIFICATION OF THE SUBSTRATE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Trade name/designation: Caltech Steel Primer - Part B.

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

Main use category: Primer.
Uses advised against: Not applicable.

1.3 Manufacturer/Supplier

Supplier:
Alumasc Building Products Ltd
White House Works, Bold Road, Sutton, St Helens, Merseyside, United Kingdom, WA9 4JG
Tel: +44 (0)1744 648400
e-mail: technical@alumascroofing.com

1.4 Manufacturer/Supplier

Emergency telephone: 01744 648 400 - (Mon-Thurs – 08.30-17.00 Fri – 08.30-16.00)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP] and amendments¹⁾:

H226 - Flammable Liquid Category 3, H314 - Skin Corrosion/Irritation Category 1C, H336 - Specific target organ toxicity - single exposure Category 3 (narcotic effects).

Legend:

1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 – Annex VI.

2.2 Labelling according to Regulation (EU) 1272/2008

Hazard pictures:



Signal word: Danger.

Hazard statements:
H226: Flammable liquid and vapour.
H314: Causes severe skin burns and eye damage.
H336: May cause drowsiness or dizziness.

Supplementary statements: Not applicable.

Precautionary statements - prevention:
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260: do not breathe mist/vapours/spray.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves, protective clothing, eye protection, face protection & hearing protection.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting] equipment.
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.

<p>Precautionary statements - response:</p>	<p>P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER/doctor. P370+P378: In case of fire: Use alcohol resistant foam or normal protein foam to extinguish. P363: Wash contaminated clothing before reuse. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.</p>
<p>Precautionary statements - storage:</p>	<p>P403+P235: Store in a well-ventilated place. Keep cool. P405: Store locked up.</p>
<p>Precautionary statements - disposal:</p>	<p>P501: Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.</p>

2.3 Other hazards

N-Butanol:	Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply).
Isopropanol:	Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply).

3. COMPOSITION AND INFORMATION ABOUT THE COMPONENTS

3.1 Substances

Anti-corrosive steel primer.

3.1 Mixture

1.CAS No 2.EC No 3.Index No 4.REACH No	%[weight]	Name	Classification according to regulation (EC) No 1272/2008 [CLP] and amendments
1.71-36-3 2.200-751-6 3.603-004-00-6 4.01-2119484630-38-XXXX 01-2120076484-50-XXXX	30-60	N-Butanol	Flammable Liquid Category 3, Acute Toxicity (Oral) Category 4, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 1, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation); H226, H302, H336, H315, H318, H335 ^[2]
1.67-63-0 2.200-661-7 3.603-117-00-0 4.01-2119457558-25-XXXX	5-10	Isopropanol	Flammable Liquid Category 2, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Eye Irritation Category 2; H225, H336, H319 ^[2]
1.7664-38-2 2.231-633-2 3.015-011-00-6 4.01-2119485924-24-XXXX 01-2120103793-61-XXXX	5.10	Phosphoric Acid *	Skin Corrosion/Irritation Category 1B; H314 ^[2]

Legend:

1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 3. Classification drawn from C&L; *EU IOELVs available.

4. FIRST AID MEASURES

4.1 Description of first aid measures

<p>Eye contact:</p>	<p>If this product comes in contact with the eyes: - Immediately hold eyelids apart and flush the eye continuously with running water. - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</p>
---------------------	--

- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin contact:

If skin or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

Inhalation:

If fumes or combustion products are inhaled remove from contaminated area.

Lay patient down. Keep warm and rested.

Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

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.

Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.

Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).

As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.

Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.

This must definitely be left to a doctor or person authorised by him/her.

(ICSC13719)

Ingestion:

For advice, contact a Poisons Information Centre or a doctor at once. Urgent hospital treatment is likely to be needed.

If swallowed do NOT induce vomiting.

If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. Observe the patient carefully.

Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.

Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.

Transport to hospital or doctor without delay.

If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11.

4.3 Indication of any immediate medical attention and special treatment needed

Any material aspirated during vomiting may produce lung injury. Therefore, emesis should not be induced mechanically or pharmacologically. Mechanical means should be used if it is considered necessary to evacuate the stomach contents; these include gastric lavage after endotracheal intubation. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

for phosphate salts intoxication:

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Ingestion of large quantities of phosphate salts (over 1.0 grams for an adult) may cause an osmotic catharsis resulting in diarrhoea and probable abdominal cramps. Larger doses such as 4-8 grams will almost certainly cause these effects in everyone. In healthy individuals most of the ingested salt will be excreted in the faeces with the diarrhoea and, thus not cause any systemic toxicity. Doses greater than 10 grams hypothetically may cause systemic toxicity.
- Treatment should take into consideration both anionic and cation portion of the molecule.
- All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcaemia, so calcium levels should be monitored.

To treat poisoning by the higher aliphatic alcohols (up to C7):

- Gastric lavage with copious amounts of water.
- It may be beneficial to instil 60 ml of mineral oil into the stomach.
- Oxygen and artificial respiration as needed.
- Electrolyte balance: it may be useful to start 500 ml. M/6 sodium bicarbonate intravenously but maintain a cautious and conservative attitude toward electrolyte replacement unless shock or severe acidosis threatens.
- To protect the liver, maintain carbohydrate intake by intravenous infusions of glucose.
- Haemodialysis if coma is deep and persistent. [GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products, Ed 5).

Basic treatment:

Establish a patent airway with suction where necessary.

Watch for signs of respiratory insufficiency and assist ventilation as necessary.

Administer oxygen by non-rebreather mask at 10 to 15 l/min.

Monitor and treat, where necessary, for shock.

Monitor and treat, where necessary, for pulmonary oedema

Anticipate and treat, where necessary, for seizures.

DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

Give activated charcoal.

Advanced treatment:

Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred. Positive-pressure ventilation using a bag-valve mask might be of use.

Monitor and treat, where necessary, for arrhythmias.

Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.

If the patient is hypoglycaemic (decreased or loss of consciousness, tachycardia, pallor, dilated pupils, diaphoresis and/or dextrose strip or glucometer readings below 50 mg), give 50% dextrose.

Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications. Drug therapy should be considered for pulmonary oedema.

Treat seizures with diazepam.

Proparacaine hydrochloride should be used to assist eye irrigation.

Emergency department:

Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.

Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.

Acidosis may respond to hyperventilation and bicarbonate therapy.

Haemodialysis might be considered in patients with severe intoxication.

Consult a toxicologist as necessary. BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994.

For C8 alcohols and above:

Symptomatic and supportive therapy is advised in managing patients.

Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung oedema often do not manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation is therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorised by him/her should be considered.

(ICSC24419/24421).

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Alcohol stable foam.

Dry chemical powder.

BCF (where regulations permit).

5.2 Special hazards arising from the substance or mixture

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

5.3 Advice for fire-fighters

Fire-fighters:

Alert Fire Brigade and tell them location and nature of hazard.
May be violently or explosively reactive.
Wear breathing apparatus plus protective gloves in the event of a fire.

Fire/explosion hazard:

Liquid and vapour are highly flammable.
Moderate fire and explosion hazard when exposed to heat or flame.
Vapour may travel a considerable distance to source of ignition.

Combustion products include:

- carbon monoxide (CO).
- carbon dioxide (CO₂).
- other pyrolysis products typical of burning organic material.

Warning:

Long standing in contact with air and light may result in the formation of potentially explosive peroxides.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

See Section 8.

6.2 Environmental precautions

See Section 12.

6.3 Methods and materials for containment and cleaning up

Minor spills:

Slippery when spilt.

Environmental hazard - contain spillage.

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.

Major spills:

Slippery when spilt.

Environmental hazard - contain spillage.

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.

6.4 Reference to other sections

See Section 8 for information on appropriate personal protective equipment.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Safe handling:

Containers, even those that have been emptied, may contain explosive vapours.
Do NOT cut, drill, grind, weld or perform similar operations on or near containers.
Avoid all personal contact, including inhalation.
Wear protective clothing when risk of overexposure occurs.
Use in a well-ventilated area.

Fire & explosion protection:

See Section 5.

Other information: Store in original containers in approved flame-proof area.
Store away from incompatible materials in a cool, dry, well ventilated area.
DO NOT store in pits, depressions, basements or areas where vapours may be trapped.

7.2 Conditions for safe storage, including any incompatibilities

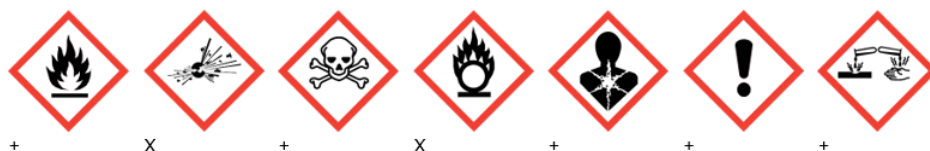
Suitable container: Packing as supplied by manufacturer.
Plastic containers may only be used if approved for flammable liquid.
Check that containers are clearly labelled and free from leaks.
For low viscosity materials (i): Drums and jerry cans must be of the non-removable head type. (ii): Where a can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

Storage incompatibility: Phosphoric acid:
- is a medium-strong acid which produces violent reaction with bases.
- may produce violent react when water is added to the concentrated form.
- reacts violently with solutions containing ammonia or bleach, azo compounds, epoxides and other polymerisable compounds.
- reacts, possibly violently with amines, aldehydes, alkanolamines, alcohols, alkylene oxides, amides, ammonia, ammonia hydroxide, calcium oxide, cyanides, epichlorohydrin, esters, halogenated organics, isocyanates, ketones, oleum, organic anhydrides, sodium tetraborate, sulfides, sulfuric acid, strong oxidisers, vinyl acetate.
- forms explosive mixtures with nitromethane.
- at elevated temperatures attacks many metals producing hydrogen gas.
- at room temperature does not attack stainless steel, copper or its alloys.
- attacks glass, ceramics, and some plastics, rubber and coatings.

Isopropanol (syn: isopropyl alcohol, IPA):
- forms ketones and unstable peroxides on contact with air or oxygen; the presence of ketones especially methyl ethyl ketone (MEK, 2-butanone) will accelerate the rate of peroxidation.
- reacts violently with strong oxidisers, powdered aluminium (exothermic), crotonaldehyde, diethyl aluminium bromide (ignition), dioxygenyl tetra-fluoroborate (ignition/ ambient temperature), chromium trioxide (ignition), potassium-tert-butoxide (ignition), nitroform (possible explosion), oleum (pressure increased in closed container), cobalt chloride, aluminium triisopropoxide, hydrogen plus palladium dust (ignition), oxygen gas, phosgene, phosgene plus iron salts (possible explosion), sodium dichromate plus sulfuric acid (exothermic/ incandescence), triisobutyl aluminium.
- reacts with phosphorus trichloride forming hydrogen chloride gas.
- reacts, possibly violently, with alkaline earth and alkali metals, strong acids, strong caustics, acid anhydrides, halogens, aliphatic amines, aluminium isopropoxide, isocyanates, acetaldehyde, barium perchlorate (forms highly explosive perchloric ester compound), benzoyl peroxide, chromic acid, dialkylzincs, dichlorine oxide, ethylene oxide (possible explosion), hexamethylene diisocyanate (possible explosion), hydrogen peroxide (forms explosive compound), hypochlorous acid, isopropyl chlorocarbonate, lithium aluminium hydride, lithium tetrahydroaluminate, nitric acid, nitrogen dioxide, nitrogen tetraoxide (possible explosion), pentafluoroguanidine, perchloric acid (especially hot), permonosulfuric acid, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutylaluminium, trinitromethane.
- attacks some plastics, rubber and coatings.
- reacts with metallic aluminium at high temperature may generate electrostatic charges.
- Reacts vigorously with alkalis.
- Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.

Alcohols:
- are incompatible with strong acids, acid chlorides, acid anhydrides, oxidising and reducing agents. reacts, possibly violently, with alkaline metals and alkaline earth metals to produce hydrogen.

- react with strong acids, strong caustics, aliphatic amines, isocyanates, acetaldehyde, benzoyl peroxide, chromic acid, chromium oxide, dialkylzincs, dichlorine oxide, ethylene oxide, hypochlorous acid, isopropyl chlorocarbonate, lithium tetrahydroaluminate, nitrogen dioxide, pentafluoroguanidine, phosphorus halides, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutyl-aluminium.
- should not be heated above 49 deg. C. when in contact with aluminium equipment.



- X: Must not be stored together.
0: May be stored together with specific preventions.
+: May be stored together.

7.3 Specific end use(s)

See Section 12.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Ingredient	DNELs Exposure pattern worker	PNECs Compartment
N-Butanol	Inhalation 310 mg/m ³ (Local, Chronic) Dermal 3.125 mg/kg bw/day (Systemic, Chronic) * Inhalation 55.357 mg/m ³ (Systemic, Chronic) * Oral 1.562 mg/kg bw/day (Systemic, Chronic) * Inhalation 155 mg/m ³ (Local, Chronic) *	0.082 mg/L (Water (Fresh)) 0.008 mg/L (Water - Intermittent release) 2.25 mg/L (Water (Marine)) 0.324 mg/kg sediment dw (Sediment (Fresh Water)) 0.032 mg/kg sediment dw (Sediment (Marine)) 0.017 mg/kg soil dw (Soil) 2476 mg/L (STP)
Isopropanol	Dermal 888 mg/kg bw/day (Systemic, Chronic) Inhalation 500 mg/m ³ (Systemic, Chronic) Dermal 319 mg/kg bw/day (Systemic, Chronic) * Inhalation 89 mg/m ³ (Systemic, Chronic) * Oral 26 mg/kg bw/day (Systemic, Chronic) *	140.9 mg/L (Water (Fresh)) 140.9 mg/L (Water - Intermittent release) 140.9 mg/L (Water (Marine)) 552 mg/kg sediment dw (Sediment (Fresh Water)) 552 mg/kg sediment dw (Sediment (Marine)) 28 mg/kg soil dw (Soil) 2251 mg/L (STP) 160 mg/kg food (Oral)
Phosphoric Acid	Inhalation 10.7 mg/m ³ (Systemic, Chronic) Inhalation 1 mg/m ³ (Local, Chronic) Inhalation 2 mg/m ³ (Local, Acute) Inhalation 4.57 mg/m ³ (Systemic, Chronic) * Oral 0.1 mg/kg bw/day (Systemic, Chronic) * Inhalation 0.36 mg/m ³ (Local, Chronic) *	Not available

* Values for general population.

Occupational Exposure Limits (OEL):

INGREDIENT DATA						
Source	Ingredient	Material name	TWA	STEL	Peak	Notes
UK Workplace Exposure Limits (WELs)	N-Butanol	Butan-1-Ol	Not available	154 mg/m ³ / 50 ppm	Not available	Sk
UK Workplace Exposure Limits (WELs)	Isopropanol	Propan-2-Ol	400 ppm / 999 mg/m ³	1250 mg/m ³ / 500 ppm	Not available	Not available
UK Workplace Exposure Limits (WELs)	Phosphoric Acid	Orthophosphoric Acid	1 mg/m ³	2 mg/m ³	Not available	Not available
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	Phosphoric Acid	Orthophosphoric Acid	1 mg/m ³	2 mg/m ³	Not available	Not available

EMERGENCY LIMITS			
Ingredient	TEEL-1	TEEL-2	TEEL-3
N-Butanol	60 ppm	800 ppm	8000** ppm
Isopropanol	400 ppm	2000* ppm	12000** ppm
Phosphoric Acid	Not available	Not available	Not available

Ingredient	Original IDLH	Revised IDLH
N-Butanol	1400 ppm	Not available
Isopropanol	2000 ppm	Not available
Phosphoric Acid	1000 mg/m3	Not available

8.2 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.

Personal protection:



Eye and face protection:

Chemical goggles.

Full face shield may be required for supplementary but never for primary protection of eyes.

Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.

Skin protection:

See hand protection below.

Hands/feet protection:

Wear chemical protective gloves, e.g. PVC.

Wear safety footwear or safety gumboots, e.g. rubber.

When handling corrosive liquids, wear trousers or overalls outside of boots to avoid spills entering boots.

Body protection:

See other protection below.

Other protection overalls:

Overalls.

PVC apron.

PVC protective suit may be required if exposure severe.

Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.

For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).

Non sparking safety or conductive footwear should be considered.

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: Caltech Steel Primer - Part B.

Material	CPI
NEOPRENE	A
NITRILE	A
NITRILE+PVC	A
PVC	B

HYPALON	C
NAT+NEOPR+NITRILE	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE/NATURAL	C
PE	C
PE/EVAL/PE	C
PVA	C
SARANEX-23	C
TEFLON	C

*CPI - Chemwatch Performance Index

A: Best selection.

B: Satisfactory; may degrade after 4 hours continuous immersion.

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

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

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

Environmental exposure controls:

See Section 12.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Colourless		
Physical state	Liquid	Relative density (Water = 1)	Not available
Odour	Characteristic	Partition coefficient n-octanol / water	Not available
Odour threshold	Not available	Auto-ignition temperature (°C)	Not available
pH (as supplied)	Not available	Decomposition temperature	Not available
Melting point / freezing point (°C)	Not available	Viscosity (cSt)	Not available
Initial boiling point and boiling range (°C)	Not available	Molecular weight (g/mol)	Not available
Flash point (°C)	32-55	Taste	Not available
Evaporation rate	Not available	Explosive properties	Not available
Flammability	Flammable	Oxidising properties	Not available
Upper explosive limit (%)	Not available	Surface Tension (dyn/cm or mN/m)	Not available
Lower explosive limit (%)	Not available	Volatile component (%vol)	Not available
Vapour pressure (kPa)	Not available	Gas group	Not available
Solubility in water	Immiscible	pH as a solution (1%)	Not available
Vapour density (Air = 1)	Not available	VOC g/L	Not available

9.2 Other information

Not available.

10. STABILITY AND REACTIVITY

10.1 Reactivity

See Section 7.2.

10.2 Chemical stability

Unstable in the presence of incompatible materials.
Product is considered stable.
Hazardous polymerisation will not occur.

10.3 Possibility of hazardous reactions

See Section 7.2.

10.4 Conditions to avoid

See Section 7.2.

10.5 Incompatible materials

See Section 7.2.

10.6 Hazardous decomposition products

See Section 7.2.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Inhaled:

There is strong evidence to suggest that this material can cause, if inhaled once, very serious, irreversible damage of organs.
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.
Exposure to n-butanol causes dose dependent irritation and headaches in humans, but CNS depression and prostration in mice. Though the offensive odour may forewarn, the smell sense may become fatigued.
Aliphatic alcohols with more than 3-carbons cause headache, dizziness, drowsiness, muscle weakness and delirium, central depression, coma, seizures and behavioural changes. Secondary respiratory depression and failure, as well as low blood pressure and irregular heart rhythms, may follow.
The material has NOT been classified by EC Directives or other classification systems as "harmful by inhalation". This is because of the lack of corroborating animal or human evidence.
Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination.
Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary oedema.
The odour of isopropanol may give some warning of exposure, but odour fatigue may occur. Inhalation of isopropanol may produce irritation of the nose and throat with sneezing, sore throat and runny nose.
Inhalation of the vapour may cause choking, coughing, headache, weakness and dizziness, and with long term exposure, fluid accumulation in the lungs and blueness, initially in the fingertips.
Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce severely toxic effects.
Relatively small amounts absorbed from the lungs may prove fatal.

Ingestion:

The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
There is strong evidence to suggest that this material can cause, if swallowed once, very serious, irreversible damage of organs. Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and inco-ordination, giddiness, confusion, delirium and coma.
Swallowing of n-butanol may cause breathing difficulties, headache, nausea, vomiting, irritation of the airway and mucous membranes as well as depression of the central nervous system.

The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.

Swallowing 10 millilitres of isopropanol may cause serious injury; 100 millilitres may be fatal if not properly treated. The adult single lethal dose is approximately 250 millilitres. Isopropanol is twice as poisonous as ethanol, and the effects caused are similar, except that isopropanol does not cause an initial feeling of well-being.

Ingesting large amounts of phosphoric acid may cause severe abdominal pain, thirst, acidaemia (excessive acid in the blood), breathing difficulties, convulsions, collapse, shock and death. It also has a corrosive effect if swallowed.

Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. (ICSC13733).

Skin contact:

The material can produce chemical burns following direct contact with the skin.

There is strong evidence to suggest that this material, on a single contact with skin, can cause very serious, irreversible damage of organs. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.

Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.

Open cuts, abraded or irritated skin should not be exposed to this material.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

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Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

Eye:

The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.

N-butanol can cause eye damage, burning sensation, blurring of vision, excessive tear formation and discomfort to bright light.

Isopropanol vapour may cause mild eye irritation at 400 parts per million. Splashes may cause severe eye irritation, possible burns to the cornea and eye damage. Eye contact may cause tearing and blurring of vision

Chronic:

Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Hearing and balance loss have been reported with exposure to n-butanol, especially with concomitant long term unprotected exposure to high noise.

Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.

Long term, or repeated exposure of isopropanol may cause inco-ordination and tiredness.

Repeated inhalation exposure to isopropanol may produce sleepiness, inco-ordination and liver degeneration. Animal data show developmental effects only at exposure levels that produce toxic effects in adult animals.

Caltech Steel Primer – Part B:

Toxicity	Irritation
Not available	Not available

N-Butanol:

Toxicity	Irritation
Dermal (rabbit) LD50: 5.235 mg/kg ^[1]	Eye (human): 50 ppm - irritant
Inhalation (rat) LC50; >17.76 mg/l4 ^[2]	Eye (rabbit): 1.6 mg - SEVERE
Oral (rat) LD50; 3.494 mg/kg ^[1]	Eye (rabbit): 24 mg/24h - SEVERE
	Eye: adverse effect observed (irreversible damage) ^[1]
	Skin (rabbit): 405 mg/24h - moderate
	Skin: adverse effect observed (irritating) ^[1]

Isopropanol:

Toxicity	Irritation
Dermal (rabbit) LD50: 21.026 mg/kg ^[1]	Eye (rabbit): 10 mg – moderate
Inhalation (mouse) LC50; 27.2 mg/l4 ^[2]	Eye (rabbit): 100 mg - SEVERE
Oral (rabbit) LD50; 667 mg/kg ^[2]	Eye (rabbit): 100 mg/24h - moderate
	Skin (rabbit): 500 mg - mild

Phosphoric Acid:

Toxicity	Irritation
Dermal (rabbit) LD50: >1260 mg/kg ^[2]	Eye (rabbit): 119 mg – SEVERE
Inhalation (rat) LC50; 0.026 mg/l4 ^[2]	Eye: adverse effect observed (irritating) ^[1]
Oral (rabbit) LD50; >300<2000 mg/kg ^[1]	Skin (rabbit): 595 mg/24h – SEVERE
	Skin: adverse effect observed (corrosive) ^[1]

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.

N-Butanol:	Acute toxicity: In animal testing, n-butanol (BA) was only slightly toxic, following exposure by swallowing, skin contact or irritation. Animal testing and human experience suggest that n-butanol is moderately irritating to the skin but severely irritating to the eye. Human studies show that BA is not likely to cause skin sensitization.
Isopropanol:	Isopropanol is irritating to the eyes, nose and throat but generally not to the skin. Prolonged high dose exposure may also produce depression of the central nervous system and drowsiness. Few have reported skin irritation. The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
Phosphoric Acid:	Phosphoric acid (85%) No significant acute toxicological data identified in literature search. For acid mists, aerosols, vapours. Test results suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5. Cells from the respiratory tract have not been examined in this respect. Mucous secretion may protect the cells of the airway from direct exposure to inhaled acidic mists (which also protects the stomach lining from the hydrochloric acid secreted there). The material may cause severe 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. Repeated exposures may produce severe ulceration.
Caltech Met-Primer – Part B & N-Butanol & Isopropanol & Phosphoric Acid	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant.
N-Butanol & Phosphoric ACID	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
N-Butanol & Isopropanol	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.

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.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Caltech Steel Primer – Part B:

End point	Test duration (hr)	Species	Value	Source
Not available	Not available	Not available	Not available	Not available

N-Butanol:

End point	Test duration (hr)	Species	Value	Source
EC50	96	Algae or other aquatic plants	225mg/l	2
NOEC (ECx)	504	Crustacea	4.1mg/l	2
EC50	48	Crustacea	>500mg/l	1
LC50	96	Fish	100500mg/l	4
EC50	72	Algae or other aquatic plants	>500mg/l	1

Isopropanol:

End point	Test duration (hr)	Species	Value	Source
LC50	96	Fish	4200mg/l	4
EC50(ECx)	24	Algae or other aquatic plants	0.011mg/L	4
EC50	48	Crustacea	7550mg/l	4
EC50	72	Algae or other aquatic plants	>1000mg/l	1
EC50	96	Algae or other aquatic plants	>1000mg/l	1

Phosphoric acid:

End point	Test duration (hr)	Species	Value	Source
EC50(ECx)	48	Crustacea	0.2890.485mg/L	4
LC50	96	Fish	0.1720.289mg/L	4
EC50	48	Crustacea	0.2890.485mg/L	4
EC50	72	Algae or other aquatic plants	77.9mg/l	2

Legend:

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 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.

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

for n-butanol (syn: BA) log Kow : 0.88

Koc : 71.6.

Half-life (hr) air : 5-52.

Half-life (hr) H2O surface water : 2.4-3022 Henry's atm m3 /mol: 5.57E-06.

BOD 5: 1.1-2.04,33%.

COD : 1.9,92%.

ThOD : 2.594.

Environmental fate:

BA's vapor pressure is 0.56 kPa at 200 C, water solubility is 77 g/L at 200 C and a Log Kow is 0.88. Based on level III fugacity modeling, BA will partition 83.5% in air, 5.9% in soil, 10.6% in water, <0.1% in suspended solids, and <0.1% in biota and in sediment. BA degrades in air by reaction with hydroxyl radicals, having a half-life in air of 1.2 to 2.3 days. For Isopropanol (IPA):

log Kow: -0.16- 0.28;

Half-life (hr) air: 33-84;

Half-life (hr) H2O surface water: 130; Henry's atm m3 /mol: 8.07E-06; BOD 5: 1.19,60%;

COD: 1.61-2.30, 97%;

ThOD: 2.4;

BOD 20: >70%.

Environmental Fate: IPA is expected to partition primarily to the aquatic compartment (77.7%) with the remainder to the air (22.3%). Overall, IPA presents a low potential hazard to aquatic or terrestrial biota.

DO NOT discharge into sewer or waterways.

12.2 Persistence & degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
N-Butanol	LOW (Half-life = 54 days)	LOW (Half-life = 3.65 days)
Isporpanol	LOW (Half-life = 14 days)	LOW (Half-life = 3 days)
Phosphoric Acid	HIGH	HIGH

12.3 Bioaccumulative potential

Ingredient	Bioaccumulation
N-Butanol	LOW (BCF = 0.64)
Isporpanol	LOW (LogKOW = 0.05)
Phosphoric Acid	LOW (LogKOW = -0.7699)

12.4 Mobility in soil

Ingredient	Mobility
N-Butanol	MEDIUM (KOC = 2.443)
Isporpanol	LOW (KOC = 1.06)
Phosphoric Acid	HIGH (KOC = 1)

12.5 Results of PBT and vPvB assessment

Not applicable.

12.6 Other adverse effects

No data available.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product/packaging disposal:	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. Recycle wherever possible. Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified. Treat and neutralise at an approved treatment plant.
Waste treatment option:	Not available.
Sewage disposal options:	Not available.

14. TRANSPORT INFORMATION

Labels required:



HAZCHEM:

•3W

Land transport (ADR-RID):

14.1. UN number	2924	
14.2. UN proper shipping name	Flammable liquid, corrosive, N.O.S.	
14.3. Transport hazard class(es)	Class:	3
	Subrisk:	8
14.4. Packing group	III	
14.5. Environmental hazard	Not applicable	
14.6. Special precautions for user	Hazard identification (Kemler):	38
	Classification code:	FC
	Hazard label:	3 +8
	Special provision:	274
	Limited quantity:	5 L
	Tunnel restriction code:	3 (D/E)

Land transport (ICAO-IATA /DGR):

14.1. UN number	2924	
14.2. UN proper shipping name	Flammable liquid, corrosive, N.O.S.*	
14.3. Transport hazard class(es)	ICAO/IATA Class:	3
	ICAO/IATA Subrisk:	8
	ERG Code:	3C
14.4. Packing group	III	
14.5. Environmental hazard	Not applicable	
14.6. Special precautions for user	Special provisions:	A3 A803
	Cargo only packing instructions:	365
	Cargo only maximum qty / pack:	60 L
	Passenger and cargo packing instructions:	354
	Passenger and cargo maximum qty / pack:	5 L
	Passenger and cargo limited quantity packing instructions:	Y342
	Passenger and Cargo Limited Maximum qty / pack	1 L

Sea transport (IMDG-Code / GGV See)

14.1. UN number	2924	
14.2. UN proper shipping name	Flammable liquid, corrosive, N.O.S.	
14.3. Transport hazard class(es)	IMDG Class:	3
	IMDG Subrisk:	8
14.4. Packing group	III	
14.5. Environmental hazard	Not applicable	
14.6. Special precautions for user	EMS Number	F-F, S-C
	Special provision:	223 274
	Limited quantities:	5 L

Inland waterways transport (AND):

14.1. UN number	2924	
14.2. UN proper shipping name	Flammable liquid, corrosive, N.O.S.	
14.3. Transport hazard class(es)	Class:	3
	Subrisk:	8
14.4. Packing group	III	
14.5. Environmental hazard	Not applicable	
14.6. Special precautions for user	Classification code:	FC
	Special provision:	274
	Limited quantity:	5 L
	Equipment required:	PP, EP, EX, A
	Fire cones number:	0

14.7 Special precautions for user

Not applicable.

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

Product name	Group
N-Butanol	Not available
Isopropanol	Not available
Phosphoric Acid	Not available

14.9 Transport in bulk in accordance with the ICG Code

Product name	Ship type
N-Butanol	Not available
Isopropanol	Not available
Phosphoric Acid	Not available

15. REGULATORY INFORMATION

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

N-Butanol is found on the following regulatory lists:

EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances.
EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.
UK Workplace Exposure Limits (WELs).

Isopropanol is found on the following regulatory:

EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs.
UK Workplace Exposure Limits (WELs).

Phosphoric is found on the following regulatory lists:

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs).
Europe EC Inventory.
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS).
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.
UK Workplace Exposure Limits (WELs).

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable:
Directives 98/24/EC, - 92/85/EEC, - 94/33/EC, - 2008/98/EC, - 2010/75/EU;
Commission Regulation (EU) 2020/878;
Regulation (EC) No 1272/2008 as updated through ATPs.

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

National inventory status:

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use:	Yes
Canada - DSL:	Yes
Canada - NDSL:	No (N-Butanol; Isopropanol, Phosphoric Acid)
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 – ARIPS:	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 and are not exempt from listing (see specific ingredients in brackets).

16. OTHER INFORMATION

Full text risk and hazard code:

H225:	Highly flammable liquid and vapour.
H302:	Harmful if swallowed.
H315:	Causes skin irritation.
H318:	Causes serious eye damage.
H319:	Causes serious eye irritation.
H335:	May cause respiratory irritation.

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 Exposure Scenarios.

For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:

EN 166:	Personal eye-protection.
EN 340:	Protective clothing.
EN 374:	Protective gloves against chemicals and micro-organisms
EN 13832:	Footwear protecting against chemicals.
EN 133:	Respiratory protective devices.

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
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.

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