

# **MG Chemicals UK Limited**

### Version No: A-1.00

Safety data sheet according to REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758

Issue Date: 18/04/2022 Revision Date: 18/04/2022 L.REACH.GB.EN

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

### 1.1. Product Identifier

Product name	4226A
Synonyms	SDS Code: 4226A-Aerosol; 4226A-340G   UFI:5FS0-40C9-J004-XEHT
Other means of identification	Clear Insulating Varnish (Aerosol)

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

Relevant identified uses	High voltage protective coating for electronic and electrical devices
Uses advised against	Not Applicable

### 1.3. Details of the supplier of the safety data sheet

Registered company name	MG Chemicals UK Limited	MG Chemicals (Head office)
Address	Hearne House, 23 Bilston Street, Sedgely Dudley DY3 1JA United Kingdom	1210 Corporate Drive Ontario L7L 5R6 Canada
Telephone	+(44) 1663 362888	+(1) 800-340-0772
Fax	Not Available	+(1) 800-340-0773
Website	Not Available	www.mgchemicals.com
Email	sales@mgchemicals.com	Info@mgchemicals.com

### 1.4. Emergency telephone number

Association / Organisation	Verisk 3E (Access code: 335388)
Emergency telephone numbers	+(44) 20 35147487
Other emergency telephone numbers	+(0) 800 680 0425

# **SECTION 2 Hazards identification**

### 2.1. Classification of the substance or mixture

Classified according to GB-CLP Regulation, UK SI 2019/720 and UK SI 2020/1567 [1]	H336 - Specific Target Organ Toxicity - Single Exposure (Narcotic Effects) Category 3, H223+H229 - Aerosols Category 2
Legend:	1. Classified by Chernwatch; 2. Classification drawn from GB-CLP Regulation, UK SI 2019/720 and UK SI 2020/1567

# 2.2. Label elements

Hazard pictogram(s)	
Signal word	Warning

# Hazard statement(s)

H336	May cause drowsiness or dizziness.
H223+H229	Flammable aerosol; Pressurized container: may burst if heated.

# Supplementary statement(s)

Repeated exposure may cause skin dryness or cracking.

EUH066

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P211	Do not spray on an open flame or other ignition source.
P251	Do not pierce or burn, even after use.
P271	Use only outdoors or in a well-ventilated area.
P261	Avoid breathing gas

# Precautionary statement(s) Response

P312	Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.	
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.	

# Precautionary statement(s) Storage

• • • •	-
P405	Store locked up.
P410+P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

### Precautionary statement(s) Disposal

P501

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

# 2.3. Other hazards

Inhalation and/or ingestion may produce health damage\*.

Cumulative effects may result following exposure\*.

May produce discomfort of the respiratory system and skin\*.

# **SECTION 3 Composition / information on ingredients**

### 3.1.Substances

See 'Composition on ingredients' in Section 3.2

### 3.2.Mixtures

1.CAS No 2.EC No 3.Index No 4.REACH No	%[weight]	Name	Classified according to GB-CLP Regulation, UK SI 2019/720 and UK SI 2020/1567	SCL / M-Factor	Nanoform Particle Characteristics
1.123-86-4 2.204-658-1 3.607-025-00-1 4.Not Available	43	n-butyl acetate * -	Flammable Liquids Category 3, Specific Target Organ Toxicity - Single Exposure (Narcotic Effects) Category 3; H226, H336 <sup>[2]</sup>	Not Available	Not Available
1.74-98-6 2.200-827-9 3.601-003-00-5 4.Not Available	20	propane	Flammable Gases Category 1, Gases Under Pressure; H220, H280 <sup>[2]</sup>	Not Available	Not Available
1.75-28-5. 2.200-857-2 3.601-004-00-0 601-004-01-8 4.Not Available	11	iso-butane	Flammable Gases Category 1A, Gases Under Pressure (Liquefied Gas); H220, H280 <sup>[1]</sup>	Not Available	Not Available
1.110-43-0 2.203-767-1 3.606-024-00-3 4.Not Available	4	amyl methyl ketone *	Flammable Liquids Category 3, Acute Toxicity (Oral) Category 4, Acute Toxicity (Inhalation) Category 4; H226, H302, H332 <sup>[2]</sup>	Not Available	Not Available
1.13586-82-8 2.237-015-9 3.Not Available 4.Not Available	<0.1	<u>cobalt</u> 2-ethylhexanoate	Acute Toxicity (Oral, Dermal and Inhalation) Category 4, Skin Corrosion/Irritation Category 2, Sensitisation (Skin) Category 1, Hazardous to the Aquatic Environment Long-Term Hazard Category 2; H302+H312+H332, H315, H317, H411 <sup>[1]</sup>	Not Available	Not Available
Legend:	1. Classified from C&L *	by Chemwatch; 2. Clas EU IOELVs available; [	sification drawn from GB-CLP Regulation, UK SI 2019/720 and UK SI 2 e] Substance identified as having endocrine disrupting properties	2020/1567; 3. C	lassification drawn

# SECTION 4 First aid measures

### 4.1. Description of first aid measures

Eye Contact	<ul> <li>If aerosols come in contact with the eyes:</li> <li>Immediately hold the eyelids apart and flush the eye continuously for at least 15 minutes with fresh running water.</li> <li>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.</li> <li>Transport to hospital or doctor without delay.</li> <li>Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
Skin Contact	<ul> <li>In case of cold burns (frost-bite):</li> <li>Move casualty into warmth before thawing the affected part; if feet are affected carry if possible</li> <li>Bathe the affected area immediately in luke-warm water (not more than 35 deg C) for 10 to 15 minutes, immersing if possible and without rubbing</li> <li>DO NOT apply hot water or radiant heat.</li> </ul>

	<ul> <li>Apply a clean, dry, light dressing of 'fluffed-up' dry gauze bandage</li> <li>If a limb is involved, raise and support this to reduce swelling</li> <li>If an adult is involved and where intense pain occurs provide pain killers such as paracetomol</li> <li>Transport to hospital, or doctor</li> <li>Subsequent blackening of the exposed tissue indicates potential of necrosis, which may require amputation.</li> <li>If solids or aerosol mists are deposited upon the skin:</li> <li>Flush skin and hair with running water (and soap if available).</li> <li>Remove any adhering solids with industrial skin cleansing cream.</li> <li>DO NOT use solvents.</li> <li>Seek medical attention in the event of irritation.</li> </ul>
Inhalation	<ul> <li>If aerosols, fumes or combustion products are inhaled:</li> <li>Remove to fresh air.</li> <li>Lay patient down. Keep warm and rested.</li> <li>Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>If breathing is shallow or has stopped, ensure clear airway and apply resuscitation, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>Transport to hospital, or doctor.</li> </ul>
Ingestion	<ul> <li>Not considered a normal route of entry.</li> <li>If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.</li> </ul>

### 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

### For petroleum distillates

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption - decontamination (induced emesis or lavage) is controversial and should be considered on the merits of each individual case; of course the usual precautions of an endotracheal tube should be considered prior to lavage, to prevent aspiration.

- Individuals intoxicated by petroleum distillates should be hospitalized immediately, with acute and continuing attention to neurologic and cardiopulmonary function.
- Positive pressure ventilation may be necessary.
- Acute central nervous system signs and symptoms may result from large ingestions of aspiration-induced hypoxia.

After the initial episode individuals should be followed for changes in blood variables and the delayed appearance of pulmonary oedema and chemical pneumonitis. Such patients should be followed for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated.

- Gastrointestinal symptoms are usually minor and pathological changes of the liver and kidneys are reported to be uncommon in acute intoxications.
- Chlorinated and non-chlorinated hydrocarbons may sensitize the heart to epinephrine and other circulating catecholamines so that arrhythmias may occur. Careful consideration
  of this potential adverse effect should precede administration of epinephrine or other cardiac stimulants and the selection of bronchodilators.

### BP America Product Safety & Toxicology Department

### Treat symptomatically.

for simple esters:

### 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 pulmonary oedema.
- Monitor and treat, where necessary, for shock.
- 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.
- Drug therapy should be considered for pulmonary oedema.
- + Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- 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.

Consult a toxicologist as necessary

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

### **SECTION 5 Firefighting measures**

#### 5.1. Extinguishing media

- Alcohol stable foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog Large fires only.

### SMALL FIRE: • Water spray, dry chemical or CO2 LARGE FIRE: • Water spray or fog.

# 5.2. Special hazards arising from the substrate or mixture

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

### 5.3. Advice for firefighters

	GENERAL
	<ul> <li>Alert Fire Brigade and tell them location and nature of hazard.</li> <li>Wear full body protective clothing with breathing apparatus.</li> <li>Fight fire from a safe distance, with adequate cover.</li> <li>If safe, switch off electrical equipment until vapour fire hazard removed.</li> <li>Use water delivered as a fine spray to control fire and cool adjacent area.</li> <li>DO NOT approach cylinders suspected to be hot.</li> <li>Cool fire exposed cylinders with water spray from a protected location.</li> <li>If safe to do so, remove cylinders from path of fire.</li> <li>Equipment should be thoroughly decontaminated after use.</li> </ul>
Fire Fighting	FIRE FIGHTING PROCEDURES:
	<ul> <li>Excessive pressures may develop in a gas cylinder exposed in a fire; this may result in explosion.</li> <li>Cylinders with pressure relief devices may release their contents as a result of fire and the released gas may constitute a further source of hazard for the fire-fighter.</li> <li>Cylinders without pressure-relief valves have no provision for controlled release and are therefore more likely to explode if exposed to fire.</li> </ul>
	FIRE FIGHTING REQUIREMENTS:
	<ul> <li>Positive pressure, self-contained breathing apparatus is required for fire-fighting of hazardous materials.</li> <li>Full structural fire-fighting (bunker) gear is the minimum acceptable attire.</li> <li>The need for proximity, entry and special protective clothing should be determined for each incident, by a competent fire-fighting safety professional.</li> </ul>
Fire/Explosion Hazard	<ul> <li>Containers may explode when heated - Ruptured cylinders may rocket</li> <li>May burn but does not ignite easily.</li> <li>Fire exposed cylinders may vent contents through pressure relief devices thereby increasing vapour concentration</li> <li>Fire may produce irritating, poisonous or corrosive gases.</li> <li>Runoff may create fire or explosion hazard.</li> <li>May decompose explosively when heated or involved in fire.</li> <li>Contact with gas may cause burns, severe injury and/ or frostbite.</li> <li>POISONOUS: MAY BE FATAL IF INHALED, SWALLOWED OR ABSORBED THROUGH SKIN</li> <li>Decomposition may produce toxic furnes of: carbon monoxide (CO)</li> <li>carbon dioxide (CO2)</li> <li>other pyrolysis products typical of burning organic material.</li> <li>Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.</li> <li>Vented gas is more dense than air and may collect in pits, basements.</li> <li>WARNING: Aerosol containers may present pressure related hazards.</li> </ul>

# **SECTION 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 material for containment and cleaning up

<u> </u>			
Minor Spills	<ul> <li>Clean up all spills immediately.</li> <li>Avoid breathing vapours and contact with skin and eyes.</li> <li>Wear protective clothing, impervious gloves and safety glasses.</li> <li>Shut off all possible sources of ignition and increase ventilation.</li> <li>Wipe up.</li> <li>If safe, damaged cans should be placed in a container outdoors, away from all ignition sources, until pressure has dissipated.</li> <li>Undamaged cans should be gathered and stowed safely.</li> </ul>		
Major Spills	<ul> <li>Clear area of all unprotected personnel and move upwind.</li> <li>Alert Emergency Authority and advise them of the location and nature of hazard.</li> <li>Wear full body clothing with breathing apparatus.</li> <li>Prevent by any means available, spillage from entering drains and water-courses.</li> <li>Consider evacuation.</li> <li>Increase ventilation.</li> <li>No smoking or naked lights within area.</li> <li>Stop leak only if safe to so do.</li> <li>Water spray or fog may be used to disperse vapour.</li> <li>DO NOT enter confined space where gas may have collected.</li> <li>Keep area clear until gas has dispersed.</li> </ul>		

Remove leaking cylinders to a safe place.
Fit vent pipes. Release pressure under safe, controlled conditions
<ul> <li>Burn issuing gas at vent pipes.</li> </ul>
DO NOT exert excessive pressure on valve; DO NOT attempt to operate damaged valve.
<ul> <li>Clear area of personnel and move upwind.</li> </ul>
Alert Fire Brigade and tell them location and nature of hazard.
May be violently or explosively reactive.
<ul> <li>Wear breathing apparatus plus protective gloves.</li> </ul>
Prevent, by any means available, spillage from entering drains or water courses
No smoking, naked lights or ignition sources.
<ul> <li>Increase ventilation.</li> </ul>
<ul> <li>Stop leak if safe to do so.</li> </ul>
<ul> <li>Water spray or fog may be used to disperse / absorb vapour.</li> </ul>
Absorb or cover spill with sand, earth, inert materials or vermiculite.
If safe, damaged cans should be placed in a container outdoors, away from ignition sources, until pressure has dissipated.
<ul> <li>Undamaged cans should be gathered and stowed safely.</li> </ul>
<ul> <li>Collect residues and seal in labelled drums for disposal.</li> </ul>

# 6.4. Reference to other sections

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

# **SECTION 7 Handling and storage**

7.1. Precautions for safe handl	ing
Safe handling	<ul> <li>Natural gases contain a contaminant, radon-222, a naturally occurring radioactive gas. During subsequent processing, radon tends to concentrate in liquefied petroleum streams and in product streams having similar boiling points. Industry experience indicates that the commercial product may contain small amounts of radon-222 and its radioactive decay products (radon daughters). The actual concentration of radon-222 and radioactive daughters in process equipment (IE lines, filters, pumps and reactor units) may reach significant levels and produce potentially damaging levels of gamma radiation. A potential external radiation hazard exists at or near any pipe, valve or vessel containing a radon enriched stream or containing internal deposits of radioactive material. Field studies, however, have not shown that conditions exist that expose the worker to cumulative exposures in excess of general population limits. Equipment containing gamma-emitting decay products should be presumed to be internally contaminated with alpha-emitting decay products which may be hazardous if inhaled or ingested. During maintenance operations that require the opening of contaminated process equipment (Including pipe) efficiency particulate respirators (PS) suitable for radionucleotides or supplied air) should be worn by personnel entering a vessel or working on contaminated materials in a wet state. [<i>TEXACO</i>]</li> <li>Avoid all personal contact, including inhalation.</li> <li>Wear protective clothing when risk of exposure occurs.</li> <li>Use in a well-ventilated area.</li> <li>Prevent concentration in hollows and sumps.</li> <li>DO NOT enter confined spaces until atmosphere has been checked.</li> <li>Avoid annohing, DO NOT eat, drink or smoke.</li> <li>DO NOT enter confined spaces until atmosphere has been checked.</li> <li>Avoid contact with incompatible materials.</li> <li>When handling, DO NOT eat, drink or smoke.</li> <li>DO NOT enter confined spaces until atmosphere has been checked.</li> <li>Avoid physical damage to conta</li></ul>
Fire and explosion protection	See section 5
Other information <ul> <li>Cylinders should be stored in a purpose-built compound with good ventilation, preferably in the open.</li> <li>Such compounds should be sited and built in accordance with statutory requirements.</li> <li>The storage compound should be kept clear and access restricted to authorised personnel only.</li> <li>Cylinders stored in the open should be protected against rust and extremes of weather.</li> <li>Cylinders in storage should be properly secured to prevent toppling or rolling.</li> <li>Cylinders are fitted with valve protection this should be in place and properly secured.</li> <li>Gas cylinders should be segregated according to the requirements of the Dangerous Goods Act.</li> <li>Preferably store full and empty cylinders separately.</li> <li>Check storage areas for hazardous concentrations of gases prior to entry.</li> <li>Full cylinders should be arranged so that the oldest stock is used first.</li> <li>Cylinders in storage should be checked periodically for general condition and leakage.</li> <li>Protect cylinders against physical damage. Move and store cylinders correctly as instructed for their manual handling.</li> </ul>	

# 7.2. Conditions for safe storage, including any incompatibilities

Suitable container       Aerosol dispenser.         Check that containers are clearly labelled.		
Storage incompatibility	<ul> <li>n-Butyl acetate:</li> <li>reacts with water on standing to form acetic acid and n-butyl alcohol</li> <li>reacts violently with strong oxidisers and potassium tert-butoxide</li> <li>is incompatible with caustics, strong acids and nitrates</li> <li>dissolves rubber, many plastics, resins and some coatings</li> </ul>	

Butane/ isobutane
reacts violently with strong oxidisers
reacts with acetylene, halogens and nitrous oxides
is incompatible with chlorine dioxide, conc. nitric acid and some plastics
may generate electrostatic charges, due to low conductivity, in flow or when agitated - these may ignite the vapour.
Segregate from nickel carbonyl in the presence of oxygen, heat (20-40 C)
Esters react with acids to liberate heat along with alcohols and acids.
Strong oxidising acids may cause a vigorous reaction with esters that is sufficiently exothermic to ignite the reaction products.
Heat is also generated by the interaction of esters with caustic solutions.
Flammable hydrogen is generated by mixing esters with alkali metals and hydrides.
Esters may be incompatible with aliphatic amines and nitrates.
Propane:
reacts violently with strong oxidisers, barium peroxide, chlorine dioxide, dichlorine oxide, fluorine etc.
liquid attacks some plastics, rubber and coatings
may accumulate static charges which may ignite its vapours
Avoid strong acids, bases.
Compressed gases may contain a large amount of kinetic energy over and above that potentially available from the energy of reaction
produced by the gas in chemical reaction with other substances

### 7.3. Specific end use(s)

See section 1.2

# **SECTION 8 Exposure controls / personal protection**

### 8.1. Control parameters

Ingredient	DNELs Exposure Pattern Worker	PNECs Compartment
n-butyl acetate	Dermal 7 mg/kg bw/day (Systemic, Chronic) Inhalation 48 mg/m <sup>3</sup> (Local, Chronic) Inhalation 300 mg/m <sup>3</sup> (Local, Chronic) Dermal 11 mg/kg bw/day (Systemic, Acute) Inhalation 600 mg/m <sup>3</sup> (Local, Acute) Inhalation 600 mg/m <sup>3</sup> (Local, Acute) Dermal 3.4 mg/kg bw/day (Systemic, Chronic) * Inhalation 12 mg/m <sup>3</sup> (Systemic, Chronic) * Oral 2 mg/kg bw/day (Systemic, Chronic) * Inhalation 35.7 mg/m <sup>3</sup> (Local, Chronic) * Dermal 6 mg/kg bw/day (Systemic, Acute) * Inhalation 300 mg/m <sup>3</sup> (Systemic, Acute) * Inhalation 300 mg/m <sup>3</sup> (Local, Acute) *	0.18 mg/L (Water (Fresh)) 0.018 mg/L (Water - Intermittent release) 0.36 mg/L (Water (Marine)) 0.981 mg/kg sediment dw (Sediment (Fresh Water)) 0.098 mg/kg sediment dw (Sediment (Marine)) 0.09 mg/kg soil dw (Soil) 35.6 mg/L (STP)
amyl methyl ketone	Dermal 54.27 mg/kg bw/day (Systemic, Chronic) Inhalation 394.25 mg/m <sup>3</sup> (Systemic, Chronic) Inhalation 1 516 mg/m <sup>3</sup> (Systemic, Acute) Dermal 23.32 mg/kg bw/day (Systemic, Chronic) * Inhalation 84.31 mg/m <sup>3</sup> (Systemic, Chronic) * Oral 23.32 mg/kg bw/day (Systemic, Chronic) *	0.098 mg/L (Water (Fresh)) 0.01 mg/L (Water - Intermittent release) 0.982 mg/L (Water (Marine)) 1.89 mg/kg sediment dw (Sediment (Fresh Water)) 0.189 mg/kg sediment dw (Sediment (Marine)) 0.321 mg/kg soil dw (Soil) 12.5 mg/L (STP)
cobalt 2-ethylhexanoate	Inhalation 235.1 μg/m³ (Local, Chronic) Oral 175 μg/kg bw/day (Systemic, Chronic) * Inhalation 37 μg/m³ (Local, Chronic) *	0.62 µg/L (Water (Fresh)) 2.36 µg/L (Water - Intermittent release) 53.8 mg/kg sediment dw (Sediment (Fresh Water)) 69.8 mg/kg sediment dw (Sediment (Marine)) 10.9 mg/kg soil dw (Soil) 0.37 mg/L (STP)

\* Values for General Population

# Occupational Exposure Limits (OEL)

#### INGREDIENT DATA Source Ingredient Material name TWA STEL Peak Notes EU Consolidated List of 50 ppm / 241 723 mg/m3 / Not Indicative Occupational n-Butyl acetate Not Available n-butyl acetate 150 ppm Available mg/m3 Exposure Limit Values (IOELVs) UK Workplace Exposure Limits 150 ppm / 724 966 mg/m3 / Not Not Available n-butyl acetate Butyl acetate (WELs) mg/m3 200 ppm Available EU Consolidated List of 50 ppm / 238 475 mg/m3 / Not Indicative Occupational amyl methyl ketone Heptan-2-one Skin 100 ppm Available mg/m3 Exposure Limit Values (IOELVs) UK Workplace Exposure Limits 50 ppm / 237 475 mg/m3 / Not amyl methyl ketone Heptan-2-one Sk (WELs) mg/m3 100 ppm Available UK Workplace Exposure Limits Cobalt and Cobalt Carc (cobalt dichloride and cobalt Not 0.1 mg/m3 Not Available compounds (as Co) Available (WELs) 2-ethylhexanoate sulphate), Sen Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
n-butyl acetate	Not Available	Not Available	Not Available
propane	Not Available	Not Available	Not Available
iso-butane	5500* ppm	17000** ppm	53000*** ppm

Ingredient	TEEL-1	TEEL-2		TEEL-3
amyl methyl ketone	150 ppm	670 ppm		4000* ppm
Ingredient	Original IDLH		Revised IDLH	
n-butyl acetate	1,700 ppm		Not Available	
propane	2,100 ppm		Not Available	
iso-butane	Not Available		Not Available	
amyl methyl ketone	800 ppm		Not Available	
cobalt 2-ethylhexanoate	Not Available		Not Available	

# MATERIAL DATA

Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

ClassOSF Description

A 550 Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities

- B 26-550 As 'A' for 50-90% of persons being distracted
- C 1-26 As 'A' for less than 50% of persons being distracted
- D 0.18-1 10-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
- E <0.18 As 'D' for less than 10% of persons aware of being tested

#### For n-butyl acetate

Odour Threshold Value: 0.0063 ppm (detection), 0.038-12 ppm (recognition)

Exposure at or below the recommended TLV-TWA is thought to prevent significant irritation of the eyes and respiratory passages as well as narcotic effects. In light of the lack of substantive evidence regarding teratogenicity and a review of acute oral data a STEL is considered inappropriate.

Odour Safety Factor(OSF) OSF=3.8E2 (n-BUTYL ACETATE)

For butane:

Odour Threshold Value: 2591 ppm (recognition)

Butane in common with other homologues in the straight chain saturated aliphatic hydrocarbon series is not characterised by its toxicity but by its narcosis-inducing effects at high concentrations. The TLV is based on analogy with pentane by comparing their lower explosive limits in air. It is concluded that this limit will protect workers against the significant risk of drowsiness and other narcotic effects. Odour Safety Factor(OSF)

OSF=0.22 (n-BUTANE)

For propane Odour Safety Factor(OSF) OSF=0.16 (PROPANE) For amyl methyl ketone: Odour Threshold Value: 0.18 ppm (detection) The TLV-TWA is well below the highest level of vapour (1025 ppm) reported to be associated with adverse effects in animals including dermal irritation. Odour Safety Factor (OSF) OSF=1.4E2 (2-HEPTANONE)

#### 8.2. Exposure controls

	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard 'physically' away from the worker and ventilation that strategically 'adds' and 'removes' air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use. Employers may need to use multiple types of controls to prevent employee overexposure. General exhaust is adequate under normal conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying 'escape' velocities which, in turn, determine the 'capture velocities' of fresh circulating air required to effectively remove the contaminant.					
8.2.1. Appropriate engineering controls	Type of Contaminant:	Speed:				
	aerosols, (released at low velocity into zone of active generation) 0.5-1 m/s					
	direct spray, spray painting in shallow booths, gas discharge (active generation into zone of rapid air motion) 1-2.5 m/s (200					
	Within each range the appropriate value depends on:					
4: Large hood or large air mass in motion 4: Small hood-local control only						

Page 8 of 19

	Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.
8.2.2. Personal protection	
Eye and face protection	<ul> <li>Chemical goggles.</li> <li>Full face shield may be required for supplementary but never for primary protection of eyes.</li> <li>Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]</li> </ul>
Skin protection	See Hand protection below
Hands/feet protection	<ul> <li>For esters:</li> <li>Do NOT use natural rubber, butyl rubber, EPDM or polystyrene-containing materials.</li> <li>No special equipment needed when handling small quantities.</li> <li>OTHERWISE:</li> <li>For potentially moderate exposures:</li> <li>Wear general protective gloves, eg. light weight rubber gloves.</li> <li>For potentially heavy exposures:</li> <li>Wear chemical protective gloves, eg. PVC. and safety footwear.</li> <li>Insulated gloves:</li> <li>NOTE: Insulated gloves should be loose fitting so that may be removed quickly if liquid is spilled upon them. Insulated gloves are not made to permit hands to be placed in the liquid; they provide only short-term protection from accidental contact with the liquid.</li> </ul>
Body protection	See Other protection below
Other protection	No special equipment needed when handling small quantities. OTHERWISE: Voveralls. Skin cleansing cream. Eyewash unit. Do not spray on hot surfaces.

Recommended material(s)
GLOVE SELECTION INDEX

### **Respiratory protection**

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

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the 'Exposure Standard' (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	A-AUS	-	A-PAPR-AUS / Class 1
up to 50 x ES	-	A-AUS / Class 1	-
up to 100 x ES	-	A-2	A-PAPR-2 ^

#### ^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- The 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

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: 4226A Clear Insulating Varnish (Aerosol)

Material	CPI
PE/EVAL/PE	А
PVA	A
TEFLON	А
BUTYL	С
BUTYL/NEOPRENE	С
HYPALON	С
NATURAL RUBBER	С
NEOPRENE	С
NEOPRENE/NATURAL	С
NITRILE	С
NITRILE+PVC	С
PE	С
PVC	С
VITON/BUTYL	С

\* 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.

### 8.2.3. Environmental exposure controls

See section 12

# **SECTION 9** Physical and chemical properties

# 9.1. Information on basic physical and chemical properties

Appearance	Colourless		
Physical state	Liquified Gas	Relative density (Water = 1)	0.93
Odour	Sweet	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	>415
pH (as supplied)	Not Available	Decomposition temperature	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	>20.5
Initial boiling point and boiling range (°C)	>126	Molecular weight (g/mol)	Not Available
Flash point (°C)	27	Taste	Not Available
Evaporation rate	~8	Explosive properties	Not Available
Flammability	Flammable.	Oxidising properties	Not Available
Upper Explosive Limit (%)	9	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	2	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	407	Gas group	Not Available
Solubility in water	Partly miscible	pH as a solution (Not Available%)	Not Available
Vapour density (Air = 1)	>3.9	VOC g/L	Not Available
Nanoform Solubility	Not Available	Nanoform Particle Characteristics	Not Available
Particle Size	Not Available		

# 9.2. Other information

Not Available

# **SECTION 10 Stability and reactivity**

10.1.Reactivity	See section 7.2
10.2. Chemical stability	<ul> <li>Elevated temperatures.</li> <li>Presence of open flame.</li> <li>Product is considered stable.</li> <li>Hazardous polymerisation will not occur.</li> </ul>
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 5.3

# **SECTION 11 Toxicological information**

# 11.1. Information on toxicological effects

Inhaled	Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhaltation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further fung damage resulting in the imgainment of gas exchange, the primary function of the lungs. Respiratory tract irritation of an organic strutum of the organs strutum of the strutum of th
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual. Not normally a hazard due to physical form of product. Considered an unlikely route of entry in commercial/industrial environments Many aliphatic hydrocarbons create a burning sensation because they are irritating to the GI mucosa. Vomiting has been reported in up to one third of all hydrocarbon exposures. While most aliphatic hydrocarbons have little GI absorption, aspiration frequently occurs, either initially or in a semi-delayed fashion as the patient coughs or vomits, thereby resulting in pulmonary effects. Once aspirated, the hydrocarbons can create a severe pneumonitis.

# Page 11 of 19

# 4226A Clear Insulating Varnish (Aerosol)

	Rats given isoparaffinic hydrocarbons - isoalkanes- (after 18-24 hours fasting) showed lethargy and/or general weakness, ataxia and diarrhoea. Symptoms disappeared within 24-28 hours. Swallowing of the liquid may cause aspiration of vomit into the lungs with the risk of haemorrhaging, pulmonary oedema, progressing to chemical pneumonitis; serious consequences may result. Signs and symptoms of chemical (aspiration) pneumonitis may include coughing, gasping, choking, burning of the mouth, difficult breathing, and bluish coloured skin (cyanosis).		
Skin Contact	Repeated exposure may cause skin cracking, flaking or drying following normal handling and use. Spray mist may produce discomfort Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds 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. Vapourising liquid causes rapid cooling and contact may cause cold burns, frostbite, even through normal gloves. Frozen skin tissues are painless and appear waxy and yellow. Signs and symptoms of frost-bite may include 'pins and needles', paleness followed by numbness, a hardening an stiffening of the skin, a progression of colour changes in the affected area, (first white, then mottled and blue and eventually black; on recovery, red, hot, painful and blistered). The material may produce moderate skin in ritation; limited evidence or practical experience suggests, that the material either: • produces significant, but moderate, inflammation when applied to the healthy intact skin of animals (for up to four hours), such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.		
Eye	Direct contact with the eye may not cause irritation because of the extreme volatility of the gas; however concentrated atmospheres may produce irritation after brief exposures Limited evidence or practical experience suggests, that the material may cause severe eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Eye contact may cause significant inflammation with pain. Corneal injury may occur; permanent impairment of vision may result unless treatment is prompt and adequate. Repeated or prolonged exposure may cause severe inflammation (similar to windburn) characterised by a temporary redness of the conjunctiva (conjunctivitis): temporary impairment of vision and/or other transient eye damage/ulceration may occur.		
Chronic	Repeated or prolonged exposure may cause severe inflammation (similar to windburn) characterised by a temporary redness of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur. Long-term exposure to respiratory irritants may result in disease of the ainways involving difficult breathing and related systemic problems. Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatits following. Limited evidence suggests that repeated or long-term occupational exposure may produce numulative health effects involving organs or biochemical systems. Repeated or prolonged exposure to mixed hydrocarbons may produce narcosis with dizziness, weakness, irritability, concentration and/or memory loss, tremor in the fingers and tongue, vertigo, ollactory disorders, constriction of visual field, paraesthesias of the extremities, weight loss and anaemia and degenerative changes in the liver and kidney. Chronic exposure by petroleum workers, to the lighter hydrocarbons, has been associated with visual disturbances, damage to the central nervous system, peripheral neuropathics (including numbness and paraesthesias), psychological and neurophysiological deficits, bone marrow toxicities (including hydropase) localised dermatoses. Surface cracking and erosion may also increase susceptibility to infection by microorganisms. One epidemiological study of petroleum refinery workers has reported elevations in standard mortality ratios for skin cancer along with a dose-response relationship indicating an association between outline workplace exposure to petroleum or one of its constituents and skin cancer, particularly melanoma. Other studies have been unable to confirm this finding. Hydrocarbon solvents are liquid hydrocarbon fractions derived from petroleum processing streams, containing only carbon and hydrogen atoms, with carbon numbers ranging from approximately CS-C20 and boling between outprivide, most hydrocarbon solvents can cau		
4226A Clear Insulating	ΤΟΧΙΟΙΤΥ	IRRITATION	
Varnish (Aerosol)	Not Available	Not Available	
n-butyl acetate	TOXICITY         Dermal (rabbit) LD50: 3200 mg/kg <sup>[2]</sup> Inhalation(Rat) LC50; 0.74 mg/l4h <sup>[2]</sup> Oral (Rabbit) LD50; 3200 mg/kg <sup>[2]</sup>	IRRITATION         Eye ( human): 300 mg         Eye (rabbit): 20 mg (open)-SEVERE         Eye (rabbit): 20 mg/24h - moderate	
	Eye: no adverse effect observed (not irritating) <sup>[1]</sup> Skin (rabbit): 500 mg/24h-moderate		

		Skin: no adverse effect of	oserved (not irritating) <sup>[1]</sup>
propane	TOXICITY		IRRITATION
	Inhalation(Rat) LC50; >13023 ppm4h <sup>[1]</sup> Not Available		Not Available
	TOYICITY		IDDITATION
iso-butane	Intralation/Bat)   CE0: + 12022 ppm/th[1]		
	Innalation(Rat) LC50; >13023 ppm4n <sup>213</sup>		NUL AVAIIADIE
	τοχιριτχ		
	dermal (rat)   D50: >2000 mg/kg <sup>[1]</sup>	Eve: adverse effect obse	erved (irritation) <sup>[1]</sup>
	Inhalation(Rat) LC50: >16.7 mg/l4h <sup>[1]</sup>	Skin (rabbit): 14 mg/24b Mild	
amyl methyl ketone	Oral (Rat) LD50; 1670 mg/kg <sup>[2]</sup>	Skin (rabbit): Primary Irri	tant
		Skin: adverse effect obse	erved (irritating) <sup>[1]</sup>
		Skin: no adverse effect o	bserved (not irritating) <sup>[1]</sup>
	ΤΟΧΙΟΙΤΥ	IRRITATION	
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Eye: adverse effect obser	rved (irritating) <sup>[1]</sup>
cobalt 2-ethylhexanoate	Inhalation(Rat) LC50; >2.5 mg/L4h <sup>[2]</sup>	Skin: no adverse effect of	bserved (not irritating) <sup>[1]</sup>
	Oral (Rat) LD50; 3129 mg/kg <sup>[1]</sup>		
Legend:	1. Value obtained from Europe ECHA Registered Su	ibstances - Acute toxicity 2.* Value of	btained from manufacturer's SDS. Unless otherwise
	specified data extracted from RTECS - Register of To	oxic Effect of chemical Substances	
	Asthma-like symptoms may continue for months or e known as reactive airways dysfunction syndrome (R	even years after exposure to the mate ADS) which can occur after exposure	rial ends. This may be due to a non-allergic condition to high levels of highly irritating compound. Main
4226A Clear Insulating Varnish (Aerosol)	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. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.		
N-BUTYL ACETATE	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.		
AMYL METHYL KETONE	The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.		
COBALT 2-ETHYLHEXANOATE	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely		
	distributed can be a more important allergen than on clinical point of view, substances are noteworthy if th	e with stronger sensitising potential w ey produce an allergic test reaction ir	with which few individuals come into contact. From a nore than 1% of the persons tested.
4226A Clear Insulating	Generally,linear and branched-chain alkyl esters are hydrolysed to their component alcohols and carboxylic acids in the intestinal tract, blood and most tissues throughout the body. Following hydrolysis the component alcohols and carboxylic acids are metabolized Oral acute toxicity studies have been reported for 51 of the 67 esters of aliphatic acyclic primary alcohols and aliphatic linear saturated carboxylic acids. The very low oral acute toxicity of this group of esters is demonstrated by oral LD50 values greater than 1850 mg/kg bw Genotoxicity studies have been performed in vitro using the following esters of aliphatic acyclic primary alcohols and aliphatic linear saturated carboxylic acids: methyl acetate, butyl acetate, butyl stearate and the structurally related isoamyl formate and demonstrates that these substances are not genotoxic.		
ACETATE	The JEFCA Committee concluded that the substances in this group would not present safety concerns at the current levels of intake the esters of aliphatic acyclic primary alcohols and aliphatic linear saturated carboxylic acids are generally used as flavouring substances up to average maximum levels of 200 mg/kg. Higher levels of use (up to 3000 mg/kg) are permitted in food categories such as chewing gum and hard candy. In Europe the upper use levels for these flavouring substances are generally 1 to 30 mg/kg foods and in special food categories like candy and alcoholic beverages up to 300 mg/kg foods InternationI Program on Chemical Safety: the Joint FAO/WHO Expert Committee on Food Additives (JECFA) Esters of Aliphatic acyclic primary alcohols with aliphatic linear saturated carboxylic acids.: 1998		
PROPANE & COBALT 2-ETHYLHEXANOATE	No significant acute toxicological data identified in lite	erature search.	
Acute Toxicity	×	Carcinogenicity	×
Skin Irritation/Corrosion	×	Reproductivity	×
Serious Eye Damage/Irritation	×	STOT - Single Exposure	✓

Continued...

Respiratory or Skin sensitisation	×	STOT - Rep	eated Exposure	×
Mutagenicity	×	As	piration Hazard	×
		Legend: X − Data either not available or does not fill the criteria for classification ✓ − Data available to make classification		

#### 11.2.1. Endocrine Disruption Properties

Not Available

# **SECTION 12 Ecological information**

#### 12.1. Toxicity 4226A Clear Insulating Endpoint Test Duration (hr) Species Value Source Varnish (Aerosol) Not Available Not Available Not Available Not Available Not Available Test Duration (hr) Endpoint Species Value Source EC50(ECx) 96h Fish 18mg/l 2 18mg/l 2 LC50 96h Fish n-butyl acetate Algae or other aquatic plants EC50 72h 246mg/l 2 48h 1 EC50 Crustacea 32ma/l Endpoint Test Duration (hr) Value Source Species EC50(ECx) 7.71ma/l 2 96h Algae or other aquatic plants propane LC50 96h Fish 24.11mg/l 2 2 EC50 96h 7.71ma/l Algae or other aquatic plants Endpoint Test Duration (hr) Value Source Species EC50(ECx) 96h 7.71ma/l 2 Algae or other aquatic plants iso-butane I C50 96h Fish 24.11mg/l 2 2 EC50 96h Algae or other aquatic plants 7.71ma/l Endpoint Test Duration (hr) Species Value Source NOEC(ECx) 72h Algae or other aquatic plants 42.68mg/l 2 amyl methyl ketone LC50 96h Fish 131mg/l 2 EC50 72h Algae or other aquatic plants 2 75.5mg/l 2 EC50 48h Crustacea >90.1mg/l Endpoint Test Duration (hr) Species Value Source NOEC(ECx) 24h Algae or other aquatic plants 0.025mg/l 2 LC50 96h Fish 1.512mg/l 2 cobalt 2-ethvlhexanoate 44.39mg/l 2 EC50 72h Algae or other aquatic plants 2 EC50 48h Crustacea 5.89mg/l EC50 96h Algae or other aquatic plants 10.8ma/l 2

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Harmful to aquatic organisms.

For petroleum distillates:

Environmental fate:

When petroleum substances are released into the environment, four major fate processes will take place: dissolution in water, volatilization, biodegradation and adsorption. These processes will cause changes in the composition of these UVCB substances. In the case of spills on land or water surfaces, photodegradation-another fate process-can also be significant.

As noted previously, the solubility and vapour pressure of components within a mixture will differ from those of the component alone. These interactions are complex for complex UVCBs such as petroleum hydrocarbons.

Each of the fate processes affects hydrocarbon families differently. Aromatics tend to be more water-soluble than aliphatics of the same carbon number, whereas aliphatics tend to be more volatile. Thus, when a petroleum mixture is released into the environment, the principal water contaminants are likely to be aromatics, whereas aliphatics will be the principal air contaminants. The trend in volatility by component class is as follows: alkenes = alkanes > aromatics = cycloalkanes.

The most soluble and volatile components have the lowest molecular weight; thus there is a general shift to higher molecular weight components in residual materials. Biodegradation:

Biodegradation is almost always operative when petroleum mixtures are released into the environment. It has been widely demonstrated that nearly all soils and sediments have populations of bacteria and other organisms capable of degrading petroleum hydrocarbons Degradation occurs both in the presence and absence of oxygen. Two key factors that determine degradation rates are oxygen supply and molecular structure. In general, degradation is more rapid under aerobic conditions. Decreasing trends in degradation rates according to structure are as follows:

(1) n-alkanes, especially in the C10-C25 range, which are degraded readily;

### (2) isoalkanes;

(3) alkenes

(4) benzene, toluene, ethylbenzene, xylenes (BTEX) (when present in concentrations that are not toxic to microorganisms);

(5) monoaromatics

(6) polynuclear (polycyclic) aromatic hydrocarbons (PAHs); and

(7) higher molecular weight cycloalkanes (which may degrade very slowly.

Three weathering processes-dissolution in water, volatilization and biodegradation-typically result in the depletion of the more readily soluble, volatile and degradable compounds and the accumulation of those most resistant to these processes in residues.

When large quantities of a hydrocarbon mixture enter the soil compartment, soil organic matter and other sorption sites in soil are fully saturated and the hydrocarbons will begin to form a separate phase (a non-aqueous phase liquid, or NAPL) in the soil. At concentrations below the retention capacity for the hydrocarbon in the soil, the NAPL will be immobile this is referred to as residual NAPL . Above the retention capacity, the NAPL becomes mobile and will move within the soil Bioaccumulation:

Bioaccumulation potential was characterized based on empirical and/or modelled data for a suite of petroleum hydrocarbons expected to occur in petroleum substances Bioaccumulation factors (BAFs) are the preferred metric for assessing the bioaccumulation potential of substances, as the bioconcentration factor (BCF) may not adequately account for the bioaccumulation potential of substances via the diet, which predominates for substances with log Kow > ~4.5

In addition to fish BCF and BAF data, bioaccumulation data for aquatic invertebrate species were also considered. Biota-sediment/soil accumulation factors (BSAFs), trophic magnification factors and biomagnification factors were also considered in characterizing bioaccumulation potential.

Overall, there is consistent empirical and predicted evidence to suggest that the following components have the potential for high bioaccumulation, with BAF/BCF values greater than 5000: C13–C15 isoalkanes, C12 alkenes, C12–C15 one-ring cycloalkanes, C12 and C15 two-ring cycloalkanes, C14 polycycloalkanes, C15 one-ring aromatics, C15 and C20 cycloalkane monoaromatics, C12-C13 diaromatics, C20 cycloalkane diaromatics, and C14 and C20 three-ring PAHs

These components are associated with a slow rate of metabolism and are highly lipophilic. Exposures from water and diet, when combined, suggest that the rate of uptake would exceed that of the total elimination rate. Most of these components are not expected to biomagnify in aguatic or terrestrial foodwebs, largely because a combination of metabolism, low dietary assimilation efficiency and growth dilution allows the elimination rate to exceed the uptake rate from the diet; however,

one study suggests that some alkyl-PAHs may biomagnify. While only BSAFs were found for some PAHs, it is possible that BSAFs will be > 1 for invertebrates, given that they do not have the same metabolic competency as fish.

In general, fish can efficiently metabolize aromatic compounds. There is some evidence that alkylation increases bioaccumulation of naphthalene but it is not known if this can be generalized to larger PAHs or if any potential increase in bioaccumulation due to alkylation will be sufficient to exceed a BAF/BCF of 5000.

Some lower trophic level organisms (i.e., invertebrates) appear to lack the capacity to efficiently metabolize aromatic compounds, resulting in high bioaccumulation potential for some aromatic components as compared to fish.

This is the case for the C14 three-ring PAH, which was bioconcentrated to a high level (BCF > 5000) by invertebrates but not by fish. There is potential for such bioaccumulative components to reach toxic levels in organisms if exposure is continuous and of sufficient magnitude, though this is unlikely in the water column following a spill scenario due to relatively rapid dispersal

Bioaccumulation of aromatic compounds might be lower in natural environments than what is observed in the laboratory. PAHs may sorb to organic material suspended in the water column (dissolved humic material), which decreases their overall bioavailability primarily due to an increase in size. This has been observed with fish Ecotoxicity

Diesel fuel studies in salt water are available. The values varied greatly for aquatic species such as rainbow trout and Daphnia magna, demonstrating the inherent variability of diesel fuel compositions and its effects on toxicity. Most experimental acute toxicity values are above 1 mg/L. The lowest 48-hour LC50 for salmonids was 2.4 mg/L. Daphnia magna had a 24-hour LC50 of 1.8 mg/. The values varied greatly for aquatic species such as rainbow trout and Daphnia magna, demonstrating the inherent variability of diesel fuel compositions and its effects on toxicity. Most experimental acute toxicity values are above 1 mg/L. The lowest 48-hour LC50 for salmonids was 2.4 mg/L. Daphnia magna had a 24-hour LC50 of 1.8 ma/L

The tropical mysid Metamysidopsis insularis was shown to be very sensitive to diesel fuel, with a 96-hour LC50 value of 0.22 mg/L this species has been shown to be as sensitive as temperate mysids to toxicants. However, However this study used nominal concentrations, and therefore was not considered acceptable. In another study involving diesel fuel, the effect on brown or common shrimp (Crangon crangon) a 96-hour LC50 of 22 mg/L was determined. A "gas oil" was also tested and a 96-hour LC50 of 12 mg/L was determined The steady state cell density of marine phytoplankton decreased with increasing concentrations of diesel fuel, with different sensitivities between species. The diatom Phaeodactylum tricornutum showed a 20% decrease in cell density in 24 hours following a 3 mg/L exposure with a 24-hour no-observed effect concentration (NOEC) of 2.5 mg/L. The microalga Isochrysis galbana was more tolerant to diesel fuel, with a 24-hour lowest-observed-effect concentration (LOEC) of 26 mg/L (14% decrease in cell density), and a NOEC of 25 mg/L. Finally, the green algae Chlorella salina was relatively insensitive to diesel fuel contamination, with a 24-hour LOEC of 170 mg/L (27% decrease in cell density), and a NOEC of 160 mg/L . All populations of phytoplankton returned to a steady state within 5 days of exposure

In sandy soils, earthworm (Eisenia fetida) mortality only occurred at diesel fuel concentrations greater than 10 000 mg/kg, which was also the concentration at which sub-lethal weight loss was recorded

Nephrotoxic effects of diesel fuel have been documented in several animal and human studies. Some species of birds (mallard ducks in particular) are generally resistant to the toxic effects of petrochemical ingestion, and large amounts of petrochemicals are needed in order to cause direct mortality

### For isobutane:

Refrigerant Gas: Saturated Hydrocarbons have zero ozone depletion potential (ODP) and will photodegrade under atmospheric conditions. [Calor Gas]

### **Environmental Fate**

Terrestrial fate: An estimated Koc value of 35 suggests that isobutane will have very high mobility in soil. Its very high Henry's Law constant, 4.08 atm-cu m/mole, (calculated from its vapor pressure and water solubility, high vapor pressure, 2611 mm Hg at 25 deg C, and low adsorptivity to soil indicate that volatilisation will be an important fate process from both moist and dry soil surfaces. Isobutane is biodegradable, especially under acclimated conditions, and may biodegrade in soil.

Aquatic fate: The estimated Koc value suggests that isobutane would not adsorb to sediment and particulate matter in the water column. Additional evidence that isobutane is not removed to sediment has been obtained from microcosm experiments. Isobutane will readily volatilise from water based on its estimated Henry's Law constant of 4.08 atm-cu m/mole. Estimated half-lives for a model river and model lake are 2.2 hr and 3.0 days, respectively. An estimated BCF value of 74 based on the log Kow suggests that isobutane will not bioconcentrate in aquatic organisms

Results indicate that gas exchange is the dominant removal mechanism for isobutane gases from the water column following a hypothetical input. The volatilisation half-lives for isobutane from the water columns in natural estuaries are estimated to be 4.4 and 6.8 days at 20 and 10 deg C, respectively.

Isobutane also biodegrades in the microcosm at a rate that is slower than for n-butane and falls between propane and ethane in susceptibility. Biodegradation of isobutane initially occurs with a half-lives of 16-26 days at 20 deg C and 33-139 days at 10 deg C, significantly slower than the loss predicted by gas exchange from typical natural estuaries. Howe after a lag of 2-4 weeks, the biodegradation rate increases markedly so that in the case of chronic inputs, biodegradation can become the dominant removal mechanism.

Atmospheric fate:: Isobutane is a gas at ordinary temperatures. It is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is 6.9 days, assuming a hydroxyl radical concn of 5x105 radicals per cubic cm. When isobutane was exposed to sunlight for 6 hr in a tedlar bag filled with Los Angeles air, 6% of the isobutane degraded The air contained 4529 ppb-C hydrocarbons and 870 ppb of NOX. The tropospheric loss of volatile hydrocarbons such as isobutane by wet and dry deposition are believed to be of minor importance. Indeed, isobutane assimilated into precipitation may evaporate during transport as well as being reemitted into the atmosphere after deposition. Isobutane is a contributor to the production of PAN (peroxyacyl nitrates) under photochemical smog conditions For Propane: Koc 460. log

# Kow 2.36

Henry's Law constant of 7.07x10-1 atm-cu m/mole, derived from its vapour pressure, 7150 mm Hg, and water solubility, 62.4 mg/L. Estimated BCF: 13.1. Terrestrial Fate: Propane is expected to have moderate mobility in soil. Volatilization from moist soil surfaces is expected to be an important fate process. Volatilization from dry soil surfaces is based vapor pressure. Biodegradation may be an important fate process in soil and sediment.

Aquatic Fate: Propane is expected to adsorb to suspended solids and sediment. Volatilization from water surfaces is expected and half-lives for a model river and model lake are estimated to be 41 minutes and 2.6 days, respectively. Biodegradation may not be an important fate process in water.

Ecotoxicity: The potential for bioconcentration in aquatic organisms is low.

Atmospheric Fate: Propane is expected to exist solely as a gas in the ambient atmosphere. Gas-phase propane is degraded in the atmosphere by reaction with photochemicallyproduced hydroxyl radicals; the half-life for this reaction in air is estimated to be 14 days and is not expected to be susceptible to direct photolysis by sunlight. DO NOT discharge into sewer or waterways.

For n-Butyl Acetate: Koc: ~200; log Kow: 1.78; Half-life (hr) air: 144; Half-life (hr) H2O surface water: 178 - 27156;

Henry's atm: m3 /mol: 3.20E-04 BOD 5 if unstated: 0.15-1.02,7%; COD: 78%; ThOD: 2.207; BCF: 4-14. Environmental Fate: Terrestrial Fa

Environmental Fate: Terrestrial Fate - Butyl acetate is expected to have moderate mobility in soil. Volatilization of n-butyl acetate is expected from moist and dry soil surfaces. n-Butyl acetate may biodegrade in soil. Aquatic Fate: n-Butyl acetate is not expected to adsorb to suspended solids and sediment in water. Butyl acetate is expected to volatilize from water surfaces. Estimated half-lives for a model river and model lake are 7 and 127 hours respectively. Hydrolysis may be an important environmental fate for this compound. Atmospheric Fate: n-Butyl acetate is expected to exist solely as a vapour in the ambient atmosphere. Vapour-phase n-butyl acetate is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be about 4 days.

Ecotoxicity: It is expected that bioconcentration in aquatic organisms is low. n-Butyl acetate is not acutely toxic to fish specifically, island silverside, bluegill sunfish, fathead minnow, and water fleas and has low toxicity to algae.

### 12.2. Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
n-butyl acetate	LOW	LOW
propane	LOW	LOW
iso-butane	HIGH	HIGH
amyl methyl ketone	LOW	LOW

#### 12.3. Bioaccumulative potential

Ingredient	Bioaccumulation
n-butyl acetate	LOW (BCF = 14)
propane	LOW (LogKOW = 2.36)
iso-butane	LOW (BCF = 1.97)
amyl methyl ketone	LOW (LogKOW = 1.98)

# 12.4. Mobility in soil

Ingredient	Mobility
n-butyl acetate	LOW (KOC = 20.86)
propane	LOW (KOC = 23.74)
iso-butane	LOW (KOC = 35.04)
amyl methyl ketone	LOW (KOC = 24.01)

### 12.5. Results of PBT and vPvB assessment

	Р	В	т
Relevant available data	Not Available	Not Available	Not Available
PBT	×	×	×
vPvB	×	×	×
PBT Criteria fulfilled? No			
vPvB No			No

### **12.6. Endocrine Disruption Properties**

Not Available

### 12.7. Other adverse effects

Not Available

### **SECTION 13 Disposal considerations**

13.1. Waste treatment methods	
Product / Packaging disposal	<ul> <li>DO NOT allow wash water from cleaning or process equipment to enter drains.</li> <li>It may be necessary to collect all wash water for treatment before disposal.</li> <li>In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</li> <li>Where in doubt contact the responsible authority.</li> <li>Consult State Land Waste Management Authority for disposal.</li> <li>Discharge contents of damaged aerosol cans at an approved site.</li> <li>Allow small quantities to evaporate.</li> <li>DO NOT incinerate or puncture aerosol cans.</li> <li>Bury residues and emptied aerosol cans at an approved site.</li> </ul>
Waste treatment options	Not Available
Sewage disposal options	Not Available

# **SECTION 14 Transport information**



# Land transport (ADR-RID)

14.1 LIN number	1950		
14.2. UN proper shipping name	AEROSOLS		
14.3. Transport hazard class(es)	Class 2.1 Subrisk Not Applicable		
14.4. Packing group	Not Applicable		
14.5. Environmental hazard	Not Applicable		
14.6. Special precautions for user	Hazard identification (Kemler) Classification code Hazard Label Special provisions Limited quantity Tunnel Restriction Code	Not Applicable           5F           2.1           190 327 344 625           1 L           2 (D)	

# Air transport (ICAO-IATA / DGR)

14.1. UN number	1950	1950		
14.2. UN proper shipping name	Aerosols, flammable	Aerosols, flammable		
14.3. Transport hazard class(es)	ICAO/IATA Class ICAO / IATA Subrisk	2.1 Not Applicable		
	ERG Code	10L		
14.4. Packing group	Not Applicable			
14.5. Environmental hazard	Not Applicable			
14.6. Special precautions for user	Special provisions		A145 A167 A802	
	Cargo Only Packing Instructions		203	
	Cargo Only Maximum Qty / Pack		150 kg	
	Passenger and Cargo Packing Instructions		203	
	Passenger and Cargo Maximum Qty / Pack		75 kg	
	Passenger and Cargo Limited Quantity Packing Instructions		Y203	
	Passenger and Cargo Limited Maximum Qty / Pack		30 kg G	

# Sea transport (IMDG-Code / GGVSee)

14.1. UN number	1950		
14.2. UN proper shipping name	AEROSOLS	AEROSOLS	
14.3. Transport hazard class(es)	IMDG Class 2 IMDG Subrisk 1	2.1 Not Applicable	
14.4. Packing group	Not Applicable		
14.5. Environmental hazard	Not Applicable		
14.6. Special precautions for user	EMS Number Special provisions Limited Quantities	F-D, S-U 63 190 277 327 344 381 959 1000 ml	

# Inland waterways transport (ADN)

14.1. UN number	1950
14.2. UN proper shipping name	AEROSOLS
14.3. Transport hazard class(es)	2.1 Not Applicable
14.4. Packing group	Not Applicable
14.5. Environmental hazard	Not Applicable

	Classification code	5F
	Special provisions	190; 327; 344; 625
14.6. Special precautions for	Limited quantity	1 L
	Equipment required	PP, EX, A
	Fire cones number	1

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

Not Applicable

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

Product name	Group
n-butyl acetate	Not Available
propane	Not Available
iso-butane	Not Available
amyl methyl ketone	Not Available
cobalt 2-ethylhexanoate	Not Available

#### 14.9. Transport in bulk in accordance with the ICG Code

Product name	Ship Type
n-butyl acetate	Not Available
propane	Not Available
iso-butane	Not Available
amyl methyl ketone	Not Available
cobalt 2-ethylhexanoate	Not Available

### **SECTION 15 Regulatory information**

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

#### n-butyl acetate is found on the following regulatory lists

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 Europe EC Inventory

# propane 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

### iso-butane is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List 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 1) Carcinogens: Category 1 A

EU REACH Regulation (EC) No 1907/2006 - Annex XVII (Appendix 4) Germ cell mutagens: Category 1 B

#### amyl methyl ketone is found on the following regulatory lists

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

Europe EC Inventory

### cobalt 2-ethylhexanoate is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List

Europe EC Inventory

European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)

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

# 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

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

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

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

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-butyl acetate; propane; iso-butane; amyl methyl ketone; cobalt 2-ethylhexanoate)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

### **SECTION 16 Other information**

Revision Date	18/04/2022
Initial Date	18/04/2022

### Full text Risk and Hazard codes

H220	Extremely flammable gas.
H226	Flammable liquid and vapour.
H280	Contains gas under pressure; may explode if heated.
H302	Harmful if swallowed.
H302+H312+H332	Harmful if swallowed, in contact with skin or if inhaled.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H332	Harmful if inhaled.
H411	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 Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered. 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
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL :No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index
- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances

NLP: No-Longer Polymers ENCS: Existing and New Chemical Substances Inventory KECI: Korea Existing Chemicals Inventory NZIOC: New Zealand Inventory of Chemicals PICCS: Philippine Inventory of Chemicals and Chemical Substances TSCA: Toxic Substances Control Act TCSI: Taiwan Chemical Substance Inventory INSQ: Inventario Nacional de Sustancias Químicas NCI: National Chemical Inventory FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

# **Reason for Change**

A-1.00 - First release