SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
UK REACH Regulations (SI 2019/758 as amended)

Supercedes date 30-Mar-2023 **Revision date** 02-Apr-2025 **Revision Number** 5

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

1.1. Product identifier

Product Code(s)	00589
Safety data sheet number	00589
Product Name	4-METHYLPENTAN-2-ONE
Index No	606-004-00-4
EC Number	203-550-1
CAS No	108-10-1
Synonyms	MIBK, METHYL ISOBUTYL KETONE CLN, 4-METHYLPENTAN-2-ONE, METHYL ISOBUTYL KETONE SHL, METHYL ISOBUTYL KETONE, ethanolamine, 2-diethylaminoethanol, METHYL ISOBUTYL KETONE (MIBK) CLE
Pure substance/mixture	Substance

Contains 4-METHYLPENTAN-2-ONE

Molecular weight	100.16

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

Recommended use	Surface coating Solvent Additive for Agrochemicals Laboratory chemicals Chemical intermediate For further information, see attached Exposure Scenario

1.3. Details of the supplier of the safety data sheet

Supplier
Univar Solutions UK Ltd
Aquarius House
6 Mid Point Business Park
Bradford
GBR

For further information, please contact

E-mail address	SDS.EMEA@univarsolutions.com
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306

1.4. Emergency telephone number

Emergency Telephone	SGS - +32 (0)3 575 55 55 (24h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Flammable liquids	Category 2 - (H225)
Acute toxicity - Inhalation (Vapours)	Category 4 - (H332)
Serious eye damage/eye irritation	Category 2 - (H319)
Carcinogenicity	Category 2 - (H351)
Specific target organ toxicity — single exposure	Category 3 - (H336)
Category 3 Narcotic effects	

2.2. Label elements

Contains 4-METHYLPENTAN-2-ONE

Signal word
Danger

Hazard statements
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H336 - May cause drowsiness or dizziness
H351 - Suspected of causing cancer
H225 - Highly flammable liquid and vapour
EUH066 - Repeated exposure may cause skin dryness or cracking

Precautionary statements
P201 - Obtain special instructions before use
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P312 - Call a POISON CENTER or doctor if you feel unwell
P370 + P378 - In case of fire: Use dry chemical, CO2, water spray or alcohol-resistant foam to extinguish

Additional information
This product requires tactile warnings if supplied to the general public.

2.3. Other hazards

No information available.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Weight-%	EC No (EU Index No)	UK REACH registration number	Classification according to GB CLP (SI 2020/1567 as amended)	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
4-METHYLPENTAN	>= 90 -	-	-	Acute Tox. 4 (H332)	-	-	-

-2-ONE 108-10-1	<= 100 %			Eye Irrit. 2 (H319) Carc. 2 (H351) STOT SE 3 (H336) Flam. Liq. 2 (H225) (EUH066)			

Full text of H- and EUH-phrases: see section 16

This product does not contain candidate substances of very high concern at a concentration >= 0.1% (UK REACH Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice IF exposed or concerned: Get medical advice/attention. Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. IF exposed or concerned: Get medical advice/attention.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.

Ingestion Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. Call a doctor.

Self-protection of the first aider Remove all sources of ignition. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms May cause redness and tearing of the eyes. Burning sensation.

Inhalation Inhalation of high vapour concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

Eyes Burning sensation. May cause redness and tearing of the eyes.

Dermal Repeated exposure may cause skin dryness or cracking.

4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media Dry chemical. Carbon dioxide (CO2). Water spray. Alcohol resistant foam.

Large Fire CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the Risk of ignition. Keep product and empty container away from heat and sources of ignition.

chemical	In the event of fire, cool tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Vapours can form explosive mixtures with air.
Hazardous combustion products	Carbon oxides.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Evacuate personnel to safe areas. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material.
Other information	Ventilate the area. Refer to protective measures listed in Sections 7 and 8.
For emergency responders	Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions	Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

6.3. Methods and material for containment and cleaning up

Methods for containment	Stop leak if you can do it without risk. Do not touch or walk through spilled material. A vapour suppressing foam may be used to reduce vapours. Dyke far ahead of spill to collect run-off water. Keep out of drains, sewers, ditches and waterways. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
Methods for cleaning up	Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labelled containers.
Prevention of secondary hazards	Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections	See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling	Use personal protection equipment. Avoid breathing vapours or mists. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use grounding and bonding connection when transferring this material to prevent static discharge, fire or explosion. Use with local exhaust ventilation. Use spark-proof tools and explosion-proof equipment. Keep in an area equipped with sprinklers. Avoid contact with skin, eyes or clothing.
General hygiene considerations	Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection.

Ensure that eyewash stations and safety showers are close to the workstation location.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Keep in properly labelled containers. Do not store near combustible materials. Keep in an area equipped with sprinklers.

7.3. Specific end use(s)

Specific use(s)
See section 1 for more information.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	United Kingdom
4-METHYLPENTAN-2-ONE 108-10-1	TWA: 50 ppm TWA: 208 mg/m³ STEL: 100 ppm STEL: 416 mg/m³ Sk*

Biological occupational exposure limits

Chemical name	United Kingdom
4-METHYLPENTAN-2-ONE 108-10-1	20 µmol/L - urine (4-Methylpentan-2-one) - post shift

Derived No Effect Level (DNEL) - Workers No information available

Chemical name	Oral	Dermal	Inhalation
4-METHYLPENTAN-2-ONE 108-10-1		11.8 mg/kg [4] [6]	208 mg/m³ [4] [7] 208 mg/m³ [5] [7] 83 mg/m³ [4] [5] 83 mg/m³ [5] [6]

[4] Systemic health effects.
[5] Local health effects.
[6] Long term.
[7] Short term.

Derived No Effect Level (DNEL) - General Public No information available.

Chemical name	Oral	Dermal	Inhalation
4-METHYLPENTAN-2-ONE 108-10-1	4.2 mg/kg [4] [6]	4.2 mg/kg [4] [6]	155.2 mg/m³ [4] [7] 155.2 mg/m³ [5] [7] 14.7 mg/m³ [4] [6] 14.7 mg/m³ [5] [6]

[4] Systemic health effects.
[5] Local health effects.

[6] Long term.
[7] Short term.

Predicted No Effect Concentration (PNEC) No information available.

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
4-METHYLPENTAN-2-ONE 108-10-1	0.6 mg/l		0.06 mg/l		

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
4-METHYLPENTAN-2-ONE 108-10-1	8.27 mg/kg	0.83 mg/kg	27.5 mg/l	1.3 mg/kg	

8.2. Exposure controls

Engineering controls Apply technical measures to comply with the occupational exposure limits. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment

Eye/face protection Tight sealing safety goggles. Use eye protection according to EN 166.

Hand protection Wear suitable gloves. Impervious gloves. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves. Gloves must conform to standard EN 374.

Gloves			
Duration of contact	PPE - Glove material	Glove thickness	Break through time
	Polyethylene/Ethylene Vinyl Alcohol (PE/EVAL).		>480 minutes

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron. Antistatic boots.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Gas filter, type A.

General hygiene considerations Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Ensure that eyewash stations and safety showers are close to the workstation location.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Liquid
Appearance Liquid
Colour Colourless
Odour Acetone.
Odour threshold 0.68 ppm

Property	Values	Remarks • Method
Melting point / freezing point	-84 °C	No information available.
Initial boiling point and boiling range	116 - 118 °C	No information available.
Flammability		No information available.
Flammability Limit in Air		No information available.
Upper flammability or explosive limits	8.0 %(V)	
Lower flammability or explosive limits	1.2 %(V)	
Flash point	14 °C	Closed cup.
Autoignition temperature	448 °C	No information available.
Decomposition temperature		No information available.
pH		No information available.
pH (as aqueous solution)		No information available.
Kinematic viscosity		No information available.
Dynamic viscosity	0.585 mPa s @ 20°C	No information available.
Water solubility	14.1 g/l water @ 20°C	No information available.
Solubility(ies)		No information available.
Partition coefficient	log Pow: 1.9	No information available.
Vapour pressure	26.4 hPa @ 25°C	No information available.
Relative density	0.7978 @ 20°C	No information available.
Bulk density		No information available
Liquid Density	No information available	No information available
Relative vapour density	3.45	No information available.
Particle characteristics		No information available.
Particle Size	No information available	
Particle Size Distribution	No information available	
Explosive properties	Not considered to be explosive.	
Oxidising properties	Does not meet the criteria for classification as oxidising	

9.2. Other information

Molecular weight 100.16

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity Stable under recommended storage conditions.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge Yes.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Highly flammable liquid and vapour. Vapours can form explosive mixtures with air. May form explosive peroxides.

10.4. Conditions to avoid

Conditions to avoid Heat, flames and sparks. static discharge (electrostatic discharge). Protect from direct sunlight.

10.5. Incompatible materials

Incompatible materials Oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Carbon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information

Inhalation May cause irritation of respiratory tract. May cause drowsiness or dizziness.

Eye contact Causes serious eye irritation. (based on components). May cause redness, itching, and pain.

Skin contact May cause irritation. Prolonged contact may cause redness and irritation.

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms May cause redness and tearing of the eyes.

Acute toxicity

Numerical measures of toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
4-METHYLPENTAN-2-ONE	LD50 : > 2000 - 5000 mg/kg (Rat)	LD50 : > 2000 mg/kg (Rat)	11 mg/l (Vapour)

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation May cause skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious eye damage/eye irritation Classification based on data available for ingredients. Causes serious eye irritation.

Respiratory or skin sensitisation Based on available data the classification criteria are not met.

4-METHYLPENTAN-2-ONE (108-10-1)

Method	Species	Exposure route	Results
OECD 406	Guinea pig	Dermal	Not a skin sensitiser

Germ cell mutagenicity Based on available data the classification criteria are not met.

Carcinogenicity Contains a known or suspected carcinogen. Classification based on data available for ingredients. Suspected of causing cancer.

Reproductive toxicity Based on available data the classification criteria are not met.

STOT - single exposure May cause drowsiness or dizziness.

STOT - repeated exposure Based on available data the classification criteria are not met.

Aspiration hazard Based on available data the classification criteria are not met.

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
4-METHYLPENTAN-2-ONE	-	LC50 : > 100 mg/l (96 h) Danio rerio	-	EC50 : > 100 mg/l (48 h) Daphnia magna

12.2. Persistence and degradability

Persistence and degradability Readily biodegradable.

4-METHYLPENTAN-2-ONE (108-10-1)

Method	Exposure time	Value	Results
OECD Test No. 301F: Ready Biodegradability: Manometric Respirometry Test (TG 301 F)	28 days	>60%	Readily biodegradable

12.3. Bioaccumulative potential

Bioaccumulation Not likely to bioaccumulate.

Component Information

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The product does not contain any substance(s) classified as PBT or vPvB.

Chemical name	PBT and vPvB assessment
4-METHYLPENTAN-2-ONE	The substance is not PBT / vPvB

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority.

Contaminated packaging Empty containers pose a potential fire and explosion hazard. Do not cut, puncture or weld containers.

SECTION 14: Transport information

IATA

14.1 UN number or ID number	UN1245
14.2 UN proper shipping name	METHYL ISOBUTYL KETONE
14.3 Transport hazard class(es)	3
14.4 Packing group	II
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
ERG Code	3L

IMDG

14.1 UN number or ID number	UN1245
UN proper shipping name	METHYL ISOBUTYL KETONE
14.3 Transport hazard class(es)	3
14.4 Packing group	II
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
EmS-No	F-E, S-D
14.7 Maritime transport in bulk according to IMO instruments	No information available

RID

14.1 UN number or ID number	UN1245
14.2 UN proper shipping name	METHYL ISOBUTYL KETONE
14.3 Transport hazard class(es)	3
14.4 Packing group	II
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
Classification code	F1

ADR

14.1 UN number or ID number	UN1245
14.2 UN proper shipping name	METHYL ISOBUTYL KETONE
14.3 Transport hazard class(es)	3
14.4 Packing group	II
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
Classification code	F1
Tunnel restriction code	(D/E)

SECTION 15: Regulatory information

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

National regulations

Authorisations and/or restrictions on use:
This product does not contain substances subject to authorisation (UK REACH - Annex XIV).
This product does not contain substances subject to restriction (UK REACH - Annex XVII).

Persistent Organic Pollutants
Not applicable

Export Notification requirements
Not applicable

Dangerous substance category per COMAH Regulations 2015 (as amended)
P5c - FLAMMABLE LIQUIDS

Named dangerous substances per COMAH Regulations 2015 (as amended)
Not applicable

The Ozone-Depleting Substances Regulations 2015
Not applicable

The Biocidal Products Regulations 2001 (as amended)
Not applicable

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)
Not applicable

Poisons Act 1972 (Explosive Precursors) Regulations (as Amended)
Not applicable

International Inventories

TSCA	Contact supplier for inventory compliance status
DSL/NDSL	Contact supplier for inventory compliance status
EINECS/ELINCS	Contact supplier for inventory compliance status
ENCS	Contact supplier for inventory compliance status
IECSC	Contact supplier for inventory compliance status
KECI	Contact supplier for inventory compliance status
PICCS	Contact supplier for inventory compliance status
AIIC	Contact supplier for inventory compliance status
NZIoC	Contact supplier for inventory compliance status

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AIIC - Australian Inventory of Industrial Chemicals
NZIoC - New Zealand Inventory of Chemicals

15.2. Chemical safety assessment

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

SECTION 16: Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of H-Statements referred to under section 3
EUH066 - Repeated exposure may cause skin dryness or cracking
H225 - Highly flammable liquid and vapour
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H336 - May cause drowsiness or dizziness
H351 - Suspected of causing cancer

Legend
SVHC: Substances of Very High Concern for Authorisation:

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation
+	Sensitisers		

Revision Note SDS sections updated 1 2 3 9 16

Classification procedure	
Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method
Reproductive toxicity	Calculation method
STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS
Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGL(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
National Institute of Technology and Evaluation (NITE)
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine’s PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Prepared By K Winter

Supercedes date 30-Mar-2023

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This material safety data sheet complies with the requirements of UK REACH Regulations (SI 2019/758 as amended) Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

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

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Manufacture of substance
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC1 - Manufacture of substances
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15 - Use as laboratory reagent
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC1 - Manufacture of substances

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor

Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC1 - Manufacture of substances

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous	Worker - inhalative, long-term	20.87 mg/m³	0.251

process with occasional controlled exposure	- systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251

from/to vessels/large containers at non dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.832
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg bw/d	0.029
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term	41.73 mg/m³	0.503

	- local		
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.532

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Formulation & (re)packing of substances and mixtures
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC2 - Formulation of preparations (mixtures)
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising PROC15 - Use as laboratory reagent
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent	Regular inspection and maintenance of equipment and machines

/limit releases, dispersion and exposure	Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day

exposure	Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process	Worker - inhalative, long-term	41.73 mg/m³	0.503

(synthesis or formulation)	- systemic		
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.483
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401

from/to vessels/large containers at non dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.832

PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	3.43 mg/kg bw/d	0.291
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.542
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg bw/d	0.029
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.532

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Coatings
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC7 - Industrial spraying PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising PROC15 - Use as laboratory reagent
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable respiratory protection. Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on

	appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor

Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802

PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.483
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/d	0.363
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.426
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232

from/to vessels/large containers at non dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC9 - Transfer of substance or	Worker - inhalative, long-term	20.87 mg/m³	0.251

preparation into small containers (dedicated filling line, including weighing)	- local		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.832
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.716
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.483
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	3.43 mg/kg bw/d	0.291
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.542
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg bw/d	0.029
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.532

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in cleaning agents
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC7 - Industrial spraying PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable respiratory protection. Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment

Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures

	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	8.572 mg/kg bw/d	0.726
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.789
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232

PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.716
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC13 - Treatment of articles by	Worker - inhalative, short-term	83.47 mg/m³	0.401

dipping and pouring	- local		
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.483

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in oil and gas field drilling and production operations
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other	Worker - inhalative, long-term	8.347 mg/m³	0.101

process (synthesis) where opportunity for exposure arises	- systemic		
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Lubricants
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles ERC7 - Industrial use of substances in closed systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC7 - Industrial spraying PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC17 - Lubrication at high energy conditions and in partly open process PROC18 - Greasing at high energy conditions
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC7 - Industrial use of substances in closed systems

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment	>= 2000 m3/d

plant flow	

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation

the worker	
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable respiratory protection. Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent	Regular inspection and maintenance of equipment and machines

/limit releases, dispersion and exposure	Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process

Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC18 - Greasing at high energy conditions
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC7 - Industrial use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	8.572 mg/kg bw/d	0.726
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.789
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at	Worker - inhalative, short-term - local	20.87 mg/m³	0.1

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.832
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.716
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.483
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC17 - Lubrication at high energy	Worker - inhalative, short-term	83.47 mg/m³	0.401

conditions and in partly open process	- systemic		
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.716
PROC18 - Greasing at high energy conditions	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC18 - Greasing at high energy conditions	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC18 - Greasing at high energy conditions	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC18 - Greasing at high energy conditions	Worker - combined, long-term - systemic		0.483

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Metal working fluids
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC7 - Industrial spraying PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC17 - Lubrication at high energy conditions and in partly open process
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment	>= 2000 m3/d

plant flow	

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation

the worker	
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable respiratory protection. Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent	Regular inspection and maintenance of equipment and machines

/limit releases, dispersion and exposure	Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.483
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	8.572 mg/kg bw/d	0.726
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.789
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - inhalative, short-term - local	83.47 mg/m³	0.401

dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.832
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401

PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.716
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.483
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.716

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Functional fluids
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC7 - Industrial use of substances in closed systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs

	followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC8a - Transfer of substance or	Worker - dermal, long-term -	2.742 mg/kg bw/d	0.232

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	systemic		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401

PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.832

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in laboratories
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	PROC10 - Roller application or brushing PROC15 - Use as laboratory reagent
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m^3
Worker - inhalative, long-term - systemic	83 mg/m^3
Worker - inhalative, short-term - local	208 mg/m^3
Worker - inhalative, short-term - systemic	208 mg/m^3
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m^3

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.716
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg bw/d	0.029
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.532

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in rubber production and processing.
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC6 - Calendaring operations PROC7 - Industrial spraying PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13 - Treatment of articles by dipping and pouring PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising PROC15 - Use as laboratory reagent PROC21 - Low energy manipulation of substances bound in materials and/or articles
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises

Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC6 - Calendaring operations
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and	Wear suitable respiratory protection. Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious

health evaluation	suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures

	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Provide a basic standard of general ventilation (1 to 3 air changes per hour)

the worker	
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous	Worker - inhalative, long-term	20.87 mg/m³	0.251

process with occasional controlled exposure	- systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of	Worker - inhalative, long-term - local	20.87 mg/m³	0.251

preparations and articles (multi-stage and/or significant contact)			
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.483
PROC6 - Calendaring operations	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC6 - Calendaring operations	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC6 - Calendaring operations	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC6 - Calendaring operations	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC6 - Calendaring operations	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC6 - Calendaring operations	Worker - combined, long-term - systemic		0.716
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	8.572 mg/kg bw/d	0.726
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.789
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.832
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.483
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	3.43 mg/kg bw/d	0.291
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC14 - Production of preparations	Worker - inhalative, short-term	83.47 mg/m³	0.401

or articles by tableting, compression, extrusion, pelettising	- local		
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.542
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg bw/d	0.029
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.532
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	2.829 mg/kg bw/d	0.24
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	1 mg/m³	0.012
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, short-term - systemic	4 mg/m³	0.019
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, short-term - local	4 mg/m³	0.019
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - local	1 mg/m³	0.012
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.252

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in polymer processing.
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles ERC5 - Industrial use resulting in inclusion into or onto a matrix ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC6 - Calendaring operations PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13 - Treatment of articles by dipping and pouring PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising PROC21 - Low energy manipulation of substances bound in materials and/or articles
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC5 - Industrial use resulting in inclusion into or onto a matrix
- ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises

Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC6 - Calendaring operations
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious

personal protection, hygiene and health evaluation	suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs

	followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC5 - Industrial use resulting in inclusion into or onto a matrix
- ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m^3

Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161

for exposure arises			
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.483
PROC6 - Calendaring operations	Worker - dermal, long-term - systemic	5.486 mg/kg bw/d	0.465
PROC6 - Calendaring operations	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC6 - Calendaring operations	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC6 - Calendaring operations	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC6 - Calendaring operations	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC6 - Calendaring operations	Worker - combined, long-term - systemic		0.716
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401

PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.832
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC13 - Treatment of articles by	Worker - inhalative, short-term	83.47 mg/m³	0.401

dipping and pouring	- local		
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.483
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	3.43 mg/kg bw/d	0.291
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.542
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	2.829 mg/kg bw/d	0.24
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	1 mg/m³	0.012
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, short-term - systemic	4 mg/m³	0.019
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, short-term - local	4 mg/m³	0.019
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - local	1 mg/m³	0.012
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.252

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	MIBK
Chemical name	4-METHYLPENTAN-2-ONE
Pure substance/mixture	Substance
REACH registration number	01-2119473980-30-XXXX
CAS No	108-10-1
EC No (EU Index No)	203-550-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Water treatment chemicals
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC13 - Treatment of articles by dipping and pouring
Product Name	MIBK
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Physical form of product	Liquid

Operational conditions

Remarks	Receiving surface water flow >= 18000 m3/d

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/d

Control measures to prevent releases

Water	Assumed domestic sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Organisational measures to prevent /limit releases, dispersion and	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day

exposure	Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines Clean equipment and the work area every day Ensure operatives are trained to minimise exposures Supervision in place to check that the RMMs in place are being used correctly and OCs followed

Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.6 mg/l
Freshwater sediment	8.27 mg/kg dwt
Marine water	0.06 mg/l
Marine sediment	0.83 mg/kg dwt
Soil	1.3 mg/kg dwt
Impact on Sewage Treatment	27.5 mg/l
Intermittent release	1.5 mg/l

Remarks Qualitative approach used to conclude safe use As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	11.8 mg/kg bw/d
Worker - inhalative, long-term - local	83 mg/m³
Worker - inhalative, long-term - systemic	83 mg/m³
Worker - inhalative, short-term - local	208 mg/m³
Worker - inhalative, short-term - systemic	208 mg/m³
Consumer - oral, long-term - systemic	4.2 mg/kg bw/d
Consumer - dermal, long-term - systemic	4.2 mg/kg bw/d
Consumer - inhalative, long-term - systemic	14.7 mg/m³

Calculation method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/d	0.003
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - systemic	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.167 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.042 mg/m³	0.001
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.004
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/d	0.116
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC2 - Use in closed, continuous process with occasional controlled	Worker - inhalative, short-term - local	83.47 mg/m³	0.401

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/d	0.058
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - systemic	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	166.9 mg/m³	0.802
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	41.73 mg/m³	0.503
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.561
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	6.86 mg/kg bw/d	0.581
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - systemic	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	33.39 mg/m³	0.161
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.347 mg/m³	0.101
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.682
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or	Worker - dermal, long-term -	2.742 mg/kg bw/d	0.232

preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	systemic		
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - systemic	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	20.87 mg/m³	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	5.217 mg/m³	0.063
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.295
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/d	0.232
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - systemic	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	83.47 mg/m³	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	20.87 mg/m³	0.251
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.483

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.