



SAFETY DATA SHEET N-METHYL-2-PYRROLIDONE

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

1.1. Product identifier

Product name	N-METHYL-2-PYRROLIDONE
Product number	606
Synonyms; trade names	N-METHYL PYRROLIDONE, N-METHYLPYRROLIDONE DIST, METHYL PYRROLIDONE NMP, M-PYROL, 1-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EU index number	606-021-00-7
EC number	212-828-1

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

Identified uses	Chemicals used in the synthesis and / or formulation of industrial products For further information, see attached Exposure Scenario.
Uses advised against	Cosmetics

1.3. Details of the supplier of the safety data sheet

Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com
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1.4. Emergency telephone number

Emergency telephone	SGS - +32 (0)3 575 55 55 (24h)
Sds No.	606

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards	Not Classified
Health hazards	Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Repr. 1B - H360D STOT SE 3 - H335
Environmental hazards	Not Classified

2.2. Label elements

EC number	212-828-1
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N-METHYL-2-PYRROLIDONE

Hazard pictograms



Signal word

Danger

Hazard statements

H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H360D May damage the unborn child.

Precautionary statements

P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing vapour/ spray.
P302+P352 IF ON SKIN: Wash with plenty of water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P501 Dispose of contents/ container in accordance with national regulations.

Supplemental label information

RCH002a Restricted to professional users.

2.3. Other hazards

This substance is not classified as PBT or vPvB according to current EU criteria.

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
EU index number	606-021-00-7
CAS number	872-50-4
EC number	212-828-1
Composition comments	The data shown are in accordance with the latest EC Directives.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Move affected person to fresh air at once. Place unconscious person on their side in the recovery position and ensure breathing can take place. Get medical attention if any discomfort continues.
Ingestion	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Never give anything by mouth to an unconscious person. Rinse mouth thoroughly with water. Give plenty of water to drink. Get medical attention if any discomfort continues.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if any discomfort continues.
Eye contact	Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention immediately. Continue to rinse.

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

N-METHYL-2-PYRROLIDONE

Inhalation	May cause respiratory irritation.
Ingestion	Gastrointestinal symptoms, including upset stomach. Nausea, vomiting. Diarrhoea.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye irritation.

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

Notes for the doctor	No recommendation given, but first aid may still be required in case of accidental exposure, inhalation or ingestion of this chemical. If in doubt, GET MEDICAL ATTENTION PROMPTLY!
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards	Oxides of the following substances: Nitrogen. Hydrocarbons.
Hazardous combustion products	Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

5.3. Advice for firefighters

Special protective equipment for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.
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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Follow precautions for safe handling described in this safety data sheet. Eliminate all sources of ignition. Provide adequate ventilation. Avoid inhalation of spray mist and contact with skin and eyes.
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6.2. Environmental precautions

Environmental precautions	Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.
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6.3. Methods and material for containment and cleaning up

Methods for cleaning up	Absorb spillage with inert, damp, non-combustible material. Flush contaminated area with plenty of water. Collect and place in suitable waste disposal containers and seal securely. For waste disposal, see Section 13.
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6.4. Reference to other sections

Reference to other sections	For personal protection, see Section 8.
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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions	Provide adequate ventilation. Avoid inhalation of vapours and spray/mists. Do not smoke in work area. Avoid contact with skin and eyes. Avoid spilling. When using do not eat, drink or smoke. Use only non-sparking tools. Keep away from heat, sparks and open flame.
Advice on general occupational hygiene	Wash at the end of each work shift and before eating, smoking and using the toilet. When using do not eat, drink or smoke.

N-METHYL-2-PYRROLIDONE

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Do not smoke in work area.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Occupational exposure limits

Long-term exposure limit (8-hour TWA): WEL 10 ppm 40 mg/m³

Short-term exposure limit (15-minute): WEL 20 ppm 80 mg/m³

Sk

WEL = Workplace Exposure Limit.

Sk = Can be absorbed through the skin.

DNEL

Workers - Dermal; Long term systemic effects: 4.8 mg/kg/day

Workers - Inhalation; Long term systemic effects: 14.4 mg/m³

Workers - Inhalation; Long term local effects: 40 mg/m³

General population - Inhalation; Long term local effects: 4.5 mg/m³

General population - Dermal; Long term systemic effects: 2.4 mg/kg/day

General population - Inhalation; Long term systemic effects: 3.6 mg/m³

General population - Oral; Long term systemic effects: 0.8 mg/kg/day

PNEC

- Fresh water; 0.25 mg/l

- marine water; 0.025 mg/l

- Intermittent release; 5 mg/l

- Sediment (Freshwater); 0.805 mg/kg

- Sediment (Marinewater); 0.0805 mg/kg

- Soil; 0.138 mg/kg

- STP; 10 mg/l

8.2. Exposure controls

Protective equipment



Appropriate engineering controls

Provide adequate general and local exhaust ventilation.

Eye/face protection

Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Wear chemical splash goggles. Personal protective equipment for eye and face protection should comply with European Standard EN166.

Hand protection

The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. The selected gloves should have a breakthrough time of at least 8 hours. Butyl rubber. glove thickness 0.64mm To protect hands from chemicals, gloves should comply with European Standard EN374.

Other skin and body protection

Wear suitable protective clothing as protection against splashing or contamination.

Hygiene measures

Wash at the end of each work shift and before eating, smoking and using the toilet. Provide eyewash station and safety shower.

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Respiratory protection If ventilation is inadequate, suitable respiratory protection must be worn. Particulate filter, type P2. EN 136/140/141/145/143/149

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Colourless.
Odour	Slight. Amine.
Odour threshold	No specific test data are available.
pH	pH (diluted solution): 8.5 - 10.0 @ 0.1%
Melting point	-23.6°C
Initial boiling point and range	204.3°C
Flash point	91°C
Evaporation rate	No information available.
Evaporation factor	No information available.
Flammability (solid, gas)	No information available.
Upper/lower flammability or explosive limits	Upper flammable/explosive limit: 9.5
Other flammability	No information available.
Vapour pressure	0.32 hPa @ 20°C
Vapour density	No information available.
Relative density	1.028 @ 25°C
Bulk density	No information available.
Solubility(ies)	Soluble in water.
Partition coefficient	log Pow: -0.46
Auto-ignition temperature	245°C
Decomposition Temperature	365°C
Viscosity	1.661 mPa s @ 25°C
Explosive properties	No information available.
Explosive under the influence of a flame	Not considered to be explosive.
Oxidising properties	Does not meet the criteria for classification as oxidising.

9.2. Other information

Refractive index	No information available.
Particle size	No information available.
Molecular weight	99
Volatility	No information available.
Saturation concentration	No information available.

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Critical temperature No information available.

Volatile organic compound No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity Does not decompose when used and stored as recommended.

10.2. Chemical stability

Stability Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Vapours may form explosive mixtures with air. Exothermic reaction with acids Alkalis.

10.4. Conditions to avoid

Conditions to avoid Avoid excessive heat for prolonged periods of time. Avoid heat, flames and other sources of ignition. Moisture. Light.

10.5. Incompatible materials

Materials to avoid Strong alkalis. Strong acids.

10.6. Hazardous decomposition products

Hazardous decomposition products Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Oxides of the following substances: Nitrogen. Hydrocarbons.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 4,150.0

Species Rat

Notes (oral LD₅₀) OECD 401

ATE oral (mg/kg) 4,150.0

Acute toxicity - dermal

Acute toxicity dermal (LD₅₀ mg/kg) 5,000.0

Species Rabbit

Notes (dermal LD₅₀) OECD 402

Acute toxicity - inhalation

Acute toxicity inhalation (LC₅₀ dust/mist mg/l) 5.1

Species Rat

Notes (inhalation LC₅₀) OECD 403

ATE inhalation (dusts/mists mg/l) 5.1

Skin corrosion/irritation

N-METHYL-2-PYRROLIDONE

Skin corrosion/irritation	Causes skin irritation.
<u>Serious eye damage/irritation</u>	
Serious eye damage/irritation	Causes serious eye irritation.
<u>Respiratory sensitisation</u>	
Respiratory sensitisation	Based on available data the classification criteria are not met.
<u>Skin sensitisation</u>	
Skin sensitisation	Based on available data the classification criteria are not met.
<u>Germ cell mutagenicity</u>	
Genotoxicity - in vitro	Negative.
Genotoxicity - in vivo	Negative.
<u>Carcinogenicity</u>	
Carcinogenicity	Based on available data the classification criteria are not met.
<u>Reproductive toxicity</u>	
Reproductive toxicity - fertility	May damage the unborn child.
<u>Specific target organ toxicity - single exposure</u>	
STOT - single exposure	May cause respiratory irritation.
<u>Specific target organ toxicity - repeated exposure</u>	
STOT - repeated exposure	NOAEL 0.5 mg/l, Inhalation, Rat OCED 413
<u>Aspiration hazard</u>	
Aspiration hazard	No information available.
<u>Inhalation</u>	
Inhalation	Irritating to respiratory system.
<u>Ingestion</u>	
Ingestion	Gastrointestinal symptoms, including upset stomach.
<u>Skin contact</u>	
Skin contact	Irritating to skin.
<u>Eye contact</u>	
Eye contact	Irritating to eyes.

SECTION 12: Ecological information

Ecotoxicity	The product components are not classified as environmentally hazardous. However, large or frequent spills may have hazardous effects on the environment.
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12.1. Toxicity

Toxicity	Not considered toxic to fish.
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Acute aquatic toxicity

Acute toxicity - fish	LC ₅₀ , 96 hours: 832 mg/l, <i>Lepomis macrochirus</i> (Bluegill) LC ₅₀ , 96 hours: >500 mg/l, <i>Oncorhynchus mykiss</i> (Rainbow trout)
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Acute toxicity - aquatic invertebrates	EC ₅₀ , 48 hours: >4000 mg/l, <i>Daphnia magna</i>
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Acute toxicity - aquatic plants	EC ₅₀ , 72 hours: 600 mg/l, <i>Desmodesmus subspicatus</i>
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Acute toxicity - microorganisms	EC10, : 100 mg/l, Activated sludge
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12.2. Persistence and degradability

N-METHYL-2-PYRROLIDONE

Persistence and degradability The product is readily biodegradable.

Biodegradation - Degradation 73%: 28 days

Biological oxygen demand < 2 mg O₂/l

12.3. Bioaccumulative potential

Bioaccumulative potential The product does not contain any substances expected to be bioaccumulating.

Partition coefficient log Pow: -0.46

12.4. Mobility in soil

Mobility The product is soluble in water.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This substance is not classified as PBT or vPvB according to current EU criteria.

12.6. Other adverse effects

Cod 1600

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Waste should be treated as controlled waste. Do not puncture or incinerate, even when empty.

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

SECTION 14: Transport information

General The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
No.

14.6. Special precautions for user

Not applicable.

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

N-METHYL-2-PYRROLIDONE

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

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

EU legislation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended). Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended). Commission Regulation (EU) No 2015/830 of 28 May 2015.
Restrictions (Annex XVII Regulation 1907/2006)	This product is/contains a substance that is included in REGULATION (EC) No 1907/2006 (REACH) ANNEX XVII - RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES. Entry number: 71 Entry number: 30

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

Inventories

EU - EINECS/ELINCS

All the ingredients are listed or exempt.

Canada - DSL/NDSL

All the ingredients are listed or exempt.
DSL

US - TSCA

All the ingredients are listed or exempt.

Australia - AICS

All the ingredients are listed or exempt.

Korea - KECI

All the ingredients are listed or exempt.

China - IECSC

All the ingredients are listed or exempt.

Philippines – PICCS

All the ingredients are listed or exempt.

SECTION 16: Other information

N-METHYL-2-PYRROLIDONE

Abbreviations and acronyms used in the safety data sheet

ATE: Acute Toxicity Estimate.
 ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
 ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
 CAS: Chemical Abstracts Service.
 DNEL: Derived No Effect Level.
 IATA: International Air Transport Association.
 IMDG: International Maritime Dangerous Goods.
 Kow: Octanol-water partition coefficient.
 LC₅₀: Lethal Concentration to 50 % of a test population.
 LD₅₀: Lethal Dose to 50% of a test population (Median Lethal Dose).
 PBT: Persistent, Bioaccumulative and Toxic substance.
 PNEC: Predicted No Effect Concentration.
 REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.
 RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
 vPvB: Very Persistent and Very Bioaccumulative.
 IARC: International Agency for Research on Cancer.
 MARPOL 73/78: International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978.
 cATpE: Converted Acute Toxicity Point Estimate.
 BCF: Bioconcentration Factor.
 BOD: Biochemical Oxygen Demand.
 EC₅₀: 50% of maximal Effective Concentration.
 LOAEC: Lowest Observed Adverse Effect Concentration.
 LOAEL: Lowest Observed Adverse Effect Level.
 NOAEC: No Observed Adverse Effect Concentration.
 NOAEL: No Observed Adverse Effect Level.
 NOEC: No Observed Effect Concentration.
 LOEC: Lowest Observed Effect Concentration.
 DMEL: Derived Minimal Effect Level.
 EL50: Exposure Limit 50
 hPa: Hectopascal
 LL50: Lethal Loading fifty
 OECD: Organisation for Economic Co-operation and Development
 POW: Octanol-water partition coefficient
 SCBA: self-contained breathing apparatus
 STP: Sewage Treatment Plant
 VOC: Volatile Organic Compounds

Classification abbreviations and acronyms

Acute Tox. = Acute toxicity
 Aquatic Acute = Hazardous to the aquatic environment (acute)
 Aquatic Chronic = Hazardous to the aquatic environment (chronic)

Key literature references and sources for data

Supplier's information.

Revision comments

NOTE: Lines within the margin indicate significant changes from the previous revision.

Revision date

27/07/2021

Version number

2.003

Supersedes date

08/11/2018

SDS number

606

N-METHYL-2-PYRROLIDONE

SDS status	Approved.
Hazard statements in full	H315 Causes skin irritation. H319 Causes serious eye irritation. H335 May cause respiratory irritation. H360D May damage the unborn child.
Signature	Jitendra Panchal



Exposure scenario

Use as a Process chemical

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use as a Process chemical
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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Worker

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C 2000 Pa @ 140°C
Concentration details	Covers concentrations up to 100 %.

Use as a Process chemical

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Indoor.

Temperature Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Elevated temperature Local exhaust ventilation - efficiency of at least [%]: 90

Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

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

Use as a Process chemical

Exposure

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Worker - dermal, long-term - systemic: Exposure 0.0343 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.001732

Worker - inhalation, long-term - systemic: Exposure 0.0413 mg/m³, DNEL 40 mg/m³, RCR 0.001033

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Covers use at ambient temperatures.

Worker - dermal, long-term - systemic: Exposure 1.3714 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.069264

Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.013853

Worker - inhalation, long-term - systemic: Exposure 10.3262 mg/m³, DNEL 40 mg/m³, RCR 0.258154

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Covers use at ambient temperatures.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632

Worker - inhalation, long-term - systemic: Exposure 12.3914 mg/m³, DNEL 40 mg/m³, RCR 0.309785

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632

Worker - inhalation, long-term - systemic: Exposure 20.6523 mg/m³, DNEL 40 mg/m³, RCR 0.516308

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Charging and discharging of substances and mixtures - Industrial

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Charging and discharging of substances and mixtures - Industrial
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC1 Manufacture of the substance ERC2 Formulation into mixture ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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Worker

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C 10000 Pa @ 100°C
Concentration details	Covers concentrations up to 100 %.

Charging and discharging of substances and mixtures - Industrial

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Elevated temperature Local exhaust ventilation - efficiency of at least [%]: 90 PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Provide extract ventilation to points where emissions occur. , or: Avoid carrying out operation for more than 4 hours.
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Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
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Charging and discharging of substances and mixtures - Industrial

Exposure

PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Covers use at ambient temperatures.

Worker - dermal, long-term - systemic: Exposure 1.3714 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.069264

Worker - inhalation, long-term - systemic: Exposure 17.3479 mg/m³, DNEL 40 mg/m³, RCR 0.433699

PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.013853

Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Covers use at ambient temperatures.

Worker - dermal, long-term - systemic: Exposure 1.3714 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.069264

Worker - inhalation, long-term - systemic: Exposure 14.4566 mg/m³, DNEL 40 mg/m³, RCR 0.361415

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 0.8229 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.041558

Worker - inhalation, long-term - systemic: Exposure 3.0978 mg/m³, DNEL 40 mg/m³, RCR 0.077446

PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Covers use at ambient temperatures.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632

Worker - inhalation, long-term - systemic: Exposure 14.4566 mg/m³, DNEL 40 mg/m³, RCR 0.361415

PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 0.4114 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.020779

Worker - inhalation, long-term - systemic: Exposure 12.3914 mg/m³, DNEL 40 mg/m³, RCR 0.309785

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Charging and discharging of substances and mixtures - Professional

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Charging and discharging of substances and mixtures - Professional
Main sector	SU22 Professional uses

Environment

Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8c Widespread use leading to inclusion into/onto article (indoor) ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
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Worker

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Charging and discharging of substances and mixtures - Professional

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C
Concentration details	Covers concentrations up to 100 %.
<u>Frequency and duration of use</u>	
	Covers daily exposures up to 8 hours (unless stated differently).
<u>Other given operational conditions affecting workers exposure</u>	
Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.
<u>Organisational measures to prevent/limit releases, dispersion and exposure</u>	
Organisational measures	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Avoid carrying out operation for more than 1 hour. PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) Avoid carrying out operation for more than 4 hours.
<u>Risk management measures</u>	
	Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528 Worker - inhalation, long-term - systemic: Exposure 14.4566 mg/m³, DNEL 40 mg/m³, RCR 0.361415 PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528 Worker - inhalation, long-term - systemic: Exposure 17.3479 mg/m³, DNEL 40 mg/m³, RCR 0.433699 PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) Worker - dermal, long-term - systemic: Exposure 1.3714 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.069264 Worker - inhalation, long-term - systemic: Exposure 17.3479 mg/m³, DNEL 40 mg/m³, RCR 0.433699

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Formulation - Industrial

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Formulation - Industrial
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC2 Formulation into mixture
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Worker

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC5 Mixing or blending in batch processes PROC14 Tableting, compression, extrusion, pelletisation, granulation
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
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Formulation - Industrial

Vapour pressure 32 Pa @ 20°C 10000 Pa @ 100°C

Concentration details Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Indoor.

Temperature Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC5 Mixing or blending in batch processes PROC14 Tableting, compression, extrusion, pelletisation, granulation Elevated temperature Provide extract ventilation to points where emissions occur. Local exhaust ventilation - efficiency of at least [%]: 90

Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

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

Formulation - Industrial

Exposure

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Worker - dermal, long-term - systemic: Exposure 0.0343 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.001732

Worker - inhalation, long-term - systemic: Exposure 0.0413 mg/m³, DNEL 40 mg/m³, RCR 0.001033

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Worker - dermal, long-term - systemic: Exposure 1.3714 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.069264

Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.013853

Worker - inhalation, long-term - systemic: Exposure 20.6523 mg/m³, DNEL 40 mg/m³, RCR 0.516308

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632

Worker - inhalation, long-term - systemic: Exposure 12.3914 mg/m³, DNEL 40 mg/m³, RCR 0.309785

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632

Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262

PROC5 Mixing or blending in batch processes

Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528

Worker - inhalation, long-term - systemic: Exposure 20.6523 mg/m³, DNEL 40 mg/m³, RCR 0.516308

PROC5 Mixing or blending in batch processes

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528

Worker - inhalation, long-term - systemic: Exposure 20.6523 mg/m³, DNEL 40 mg/m³, RCR 0.516308

PROC14 Tableting, compression, extrusion, pelletisation, granulation

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632

Worker - inhalation, long-term - systemic: Exposure 14.4566 mg/m³, DNEL 40 mg/m³, RCR 0.361415

PROC14 Tableting, compression, extrusion, pelletisation, granulation

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632

Worker - inhalation, long-term - systemic: Exposure 20.6523 mg/m³, DNEL 40 mg/m³, RCR 0.516308

Formulation - Industrial

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Formulation - Professional

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Formulation - Professional
Main sector	SU22 Professional uses

Environment

Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8c Widespread use leading to inclusion into/onto article (indoor) ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
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Worker

Process category	PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC5 Mixing or blending in batch processes
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
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Formulation - Professional

Vapour pressure 32 Pa @ 20°C

Concentration details Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Indoor.

Temperature Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or:
Ensure operation is undertaken outdoors.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures PROC5 Mixing or blending in batch processes Avoid carrying out operation for more than 2 hours.

Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

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

Exposure

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.006926
Worker - inhalation, long-term - systemic: Exposure 12.3914 mg/m³, DNEL 40 mg/m³, RCR 0.309785

PROC5 Mixing or blending in batch processes
Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528
Worker - inhalation, long-term - systemic: Exposure 17.3479 mg/m³, DNEL 40 mg/m³, RCR 0.433699

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use in laboratories - Industrial

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use in laboratories - Industrial
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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Worker

Process category	PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Use in laboratories - Industrial

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Ventilation rate	Local exhaust ventilation - efficiency of at least [%]: 90

Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure	PROC15 Use as laboratory reagent. Worker - dermal, long-term - systemic: Exposure 0.3429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.017316 Worker - inhalation, long-term - systemic: Exposure 2.0652 mg/m ³ , DNEL 40 mg/m ³ , RCR 0.051631

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use in laboratories - Professional

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use in laboratories - Professional
Main sector	SU22 Professional uses

Environment

Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
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Worker

Process category	PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Use in laboratories - Professional

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Ventilation rate	Local exhaust ventilation - efficiency of at least [%]: 80

Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure	PROC15 Use as laboratory reagent. Worker - dermal, long-term - systemic: Exposure 0.3429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.017316 Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m ³ , DNEL 40 mg/m ³ , RCR 0.103262

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use in construction chemicals

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use in construction chemicals
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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Worker

Process category	PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring. PROC14 Tableting, compression, extrusion, pelletisation, granulation
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Use in construction chemicals

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Ventilation rate	PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring. Local exhaust ventilation - efficiency of at least [%]: 90 PROC14 Tableting, compression, extrusion, pelletisation, granulation Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Efficiency of at least 30%

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Provide extract ventilation to points where emissions occur. PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring.
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Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure	PROC10 Roller application or brushing Worker - dermal, long-term - systemic: Exposure 5.4857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.277056 Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262 PROC13 Treatment of articles by dipping and pouring. Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528 Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262 PROC14 Tableting, compression, extrusion, pelletisation, granulation Worker - inhalation, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632 Worker - inhalation, long-term - systemic: Exposure 14.4566 mg/m³, DNEL 40 mg/m³, RCR 0.361415

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in Coatings - Industrial

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use in Coatings - Industrial
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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Worker

Process category	PROC7 Industrial spraying PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C 10000 Pa @ 100°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Use in Coatings - Industrial

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Room size	PROC7 Industrial spraying Covers use in room size of 1000 m³.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	PROC7 Industrial spraying Provide extract ventilation to points where emissions occur. Local exhaust ventilation - efficiency of at least [%]: 95 Ensure doors and windows are opened. Ensure that spray direction is only horizontal or downward. Ensure that the direction of airflow is clearly away from the worker. PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring. Provide extract ventilation to points where emissions occur. Local exhaust ventilation - efficiency of at least [%]: 90
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	PROC7 Industrial spraying Avoid carrying out operation for more than 4 hours. Limit the substance content in the mixture to 50%. , or: Ensure that the worker is situated in an open or closed cabin. PROC13 Treatment of articles by dipping and pouring. Elevated temperature Avoid carrying out operation for more than 4 hours.
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Risk management measures

Use suitable eye protection and gloves.
 PROC7 Industrial spraying
 Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated PROC7 Industrial spraying RISKOFDERM v2.1 Stoffenmanager v4.0
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Use in Coatings - Industrial

Exposure

PROC7 Industrial spraying

Worker - dermal, long-term - systemic: Exposure 1.73 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.087374

Worker - inhalation, long-term - systemic: Exposure 18.7 mg/m³, DNEL 40 mg/m³, RCR 0.4675

PROC7 Industrial spraying

Ensure that the worker is situated in an open or closed cabin.

Worker - dermal, long-term - systemic: Exposure 3.46 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.174747

Worker - inhalation, long-term - systemic: Exposure 7.96 mg/m³, DNEL 40 mg/m³, RCR 0.199

PROC10 Roller application or brushing

Worker - dermal, long-term - systemic: Exposure 5.4857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.277056

Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262

PROC13 Treatment of articles by dipping and pouring.

Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528

Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262

PROC13 Treatment of articles by dipping and pouring.

Elevated temperature

Worker - dermal, long-term - systemic: Exposure 1.6457 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.083117

Worker - inhalation, long-term - systemic: Exposure 12.3914 mg/m³, DNEL 40 mg/m³, RCR 0.309785

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use in Coatings - Professional

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use in Coatings - Professional
Main sector	SU22 Professional uses

Environment

Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8c Widespread use leading to inclusion into/onto article (indoor) ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) ERC8f Widespread use leading to inclusion into/onto article (outdoor)
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Worker

Process category	PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C
Concentration details	Covers concentrations up to 50 %.

Use in Coatings - Professional

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Limit the substance content in the mixture to 50%.

Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure	PROC13 Treatment of articles by dipping and pouring. Worker - dermal, long-term - systemic: Exposure 1.3714 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.069264 Worker - inhalation, long-term - systemic: Exposure 14.4566 mg/m ³ , DNEL 40 mg/m ³ , RCR 0.361415

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in Cleaning Agents

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use in Cleaning Agents
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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Worker

Process category	PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C 20000 Pa @ 140°C 10000 Pa @ 100°C
Concentration details	Covers concentrations up to 100 %.

Use in Cleaning Agents

Frequency and duration of use

Covers daily exposure up to 240minutes
 PROC4 Chemical production where opportunity for exposure arises
 Assumes activities and processes are carried out at a temperature of 140°C.
 Covers daily exposure up to 15minutes

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated. PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Assumes activities and processes are carried out at a temperature of 140°C. PROC4 Chemical production where opportunity for exposure arises Assumes activities and processes are carried out at a temperature of 100°C.
Room size	PROC7 Industrial spraying Covers use in room size of 1000 m³.
Ventilation rate	PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC5 Mixing or blending in batch processes Provide extract ventilation to points where emissions occur. PROC7 Industrial spraying Ensure doors and windows are opened. Ensure that spray direction is only horizontal or downward. Ensure that the direction of airflow is clearly away from the worker. Ensure that the worker is situated in an open or closed cabin. , or: Limit the substance content in the mixture to 50%.
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Risk management measures

Use suitable eye protection and gloves.
 PROC4 Chemical production where opportunity for exposure arises
 PROC5 Mixing or blending in batch processes
 PROC10 Roller application or brushing
 PROC13 Treatment of articles by dipping and pouring.
 Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.
 PROC7 Industrial spraying
 Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.
 PROC13 Treatment of articles by dipping and pouring.
 Elevated temperature
 Assumes activities and processes are carried out at a temperature of 140°C.
 Wear a respirator providing a minimum efficiency of (%): 90
 Avoid carrying out operation for more than 15 minutes.

3. Exposure estimation (Health 1)

Use in Cleaning Agents

Assessment method

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

PROC7 Industrial spraying RISKOFDERM v2.1 Stoffenmanager v4.0

Exposure

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Worker - dermal, long-term - systemic: Exposure 0.0001 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.000001

Worker - inhalation, long-term - systemic: Exposure 0.0001 mg/m³, DNEL 40 mg/m³, RCR 0.000001

PROC4 Chemical production where opportunity for exposure arises

Assumes activities and processes are carried out at a temperature of 100°C.

Worker - dermal, long-term - systemic: Exposure 0.4114 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.020779

Worker - inhalation, long-term - systemic: Exposure 4.9566 mg/m³, DNEL 40 mg/m³, RCR 0.123914

PROC4 Chemical production where opportunity for exposure arises

Assumes activities and processes are carried out at a temperature of 140°C.

Worker - dermal, long-term - systemic: Exposure 0.0686 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.003463

Worker - inhalation, long-term - systemic: Exposure 12.3914 mg/m³, DNEL 40 mg/m³, RCR 0.309785

PROC5 Mixing or blending in batch processes

Worker - dermal, long-term - systemic: Exposure 0.8229 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.041558

Worker - inhalation, long-term - systemic: Exposure 12.3914 mg/m³, DNEL 40 mg/m³, RCR 0.309785

PROC7 Industrial spraying

Worker - dermal, long-term - systemic: Exposure 1.73 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.087374

Worker - inhalation, long-term - systemic: Exposure 18.7 mg/m³, DNEL 40 mg/m³, RCR 0.4675

PROC7 Industrial spraying

Ensure that the worker is situated in an open or closed cabin.

Worker - dermal, long-term - systemic: Exposure 3.46 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.174747

Worker - inhalation, long-term - systemic: Exposure 7.96 mg/m³, DNEL 40 mg/m³, RCR 0.199

PROC10 Roller application or brushing

Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528

Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262

PROC13 Treatment of articles by dipping and pouring.

Worker - dermal, long-term - systemic: Exposure 1.3714 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.069264

Worker - inhalation, long-term - systemic: Exposure 4.1305 mg/m³, DNEL 40 mg/m³, RCR 0.103262

PROC13 Treatment of articles by dipping and pouring.

Elevated temperature

Assumes activities and processes are carried out at a temperature of 140°C.

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.006926

Worker - inhalation, long-term - systemic: Exposure 3.0978 mg/m³, DNEL 40 mg/m³, RCR 0.077446

Use in Cleaning Agents

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use in Functional Fluids - Industrial

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use in Functional Fluids - Industrial
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC7 Use of functional fluid at industrial site
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Worker

Process category	PROC17 Lubrication at high energy conditions in metal working operations PROC18 General greasing/lubrication at high kinetic energy conditions
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Use in Functional Fluids - Industrial

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Provide extract ventilation to points where emissions occur. Local exhaust ventilation - efficiency of at least [%]: 90
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Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure	PROC17 Lubrication at high energy conditions in metal working operations Worker - dermal, long-term - systemic: Exposure 5.4857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.277056 Worker - inhalation, long-term - systemic: Exposure 8.2609 mg/m³, DNEL 40 mg/m³, RCR 0.206523 PROC18 General greasing/lubrication at high kinetic energy conditions Worker - dermal, long-term - systemic: Exposure 2.7429 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.138528 Worker - inhalation, long-term - systemic: Exposure 8.2609 mg/m³, DNEL 40 mg/m³, RCR 0.206523

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use as co-formulant in Plant protection products

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use as co-formulant in Plant protection products
Main sector	SU22 Professional uses

Environment

Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
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Worker

Process category	PROC11 Non industrial spraying
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C
Concentration details	Covers concentrations up to 5 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Use as co-formulant in Plant protection products

Other given operational conditions affecting workers exposure

Setting	Indoor/outdoor use.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Room size	Covers use in room size of 1000 m³.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Ensure that spray direction is only horizontal or downward. Ensure that the direction of airflow is clearly away from the worker. Ensure that the worker is situated in an open or closed cabin.
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Risk management measures

Wear suitable working clothes.

3. Exposure estimation (Health 1)

Assessment method	RISKOFDERM v2.1 Stoffenmanager v4.0
Exposure	PROC11 Non industrial spraying Indoor. Worker - dermal, long-term - systemic: Exposure 5.38 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.271717 Worker - inhalation, long-term - systemic: Exposure 5.27 mg/m³, DNEL 40 mg/m³, RCR 0.13175 PROC11 Non industrial spraying Outdoor. Worker - dermal, long-term - systemic: Exposure 2.21 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.11616 Worker - inhalation, long-term - systemic: Exposure 2.97 mg/m³, DNEL 40 mg/m³, RCR 0.07425

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use in Functional Fluids - Professional

Identification

Product name	N-METHYL-2-PYRROLIDONE
REACH registration number	01-2119472430-46-XXXX
CAS number	872-50-4
EC number	212-828-1
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use in Functional Fluids - Professional
Main sector	SU22 Professional uses

Environment

Environmental release category	ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
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Worker

Process category	PROC17 Lubrication at high energy conditions in metal working operations PROC18 General greasing/lubrication at high kinetic energy conditions PROC20 Use of functional fluids in small devices
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	32 Pa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Use in Functional Fluids - Professional

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 20°C. Unless otherwise stated.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	PROC17 Lubrication at high energy conditions in metal working operations PROC18 General greasing/lubrication at high kinetic energy conditions Limit the substance content in the product to 25%. PROC18 General greasing/lubrication at high kinetic energy conditions Provide extract ventilation to points where emissions occur.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	PROC18 General greasing/lubrication at high kinetic energy conditions Avoid carrying out operation for more than 4 hours.
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Risk management measures

Use suitable eye protection and gloves.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure	PROC17 Lubrication at high energy conditions in metal working operations Worker - dermal, long-term - systemic: Exposure 1.3714 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.069264 Worker - inhalation, long-term - systemic: Exposure 8.2609 mg/m³, DNEL 40 mg/m³, RCR 0.387231 PROC18 General greasing/lubrication at high kinetic energy conditions Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.034632 Worker - inhalation, long-term - systemic: Exposure 6.1957 mg/m³, DNEL 40 mg/m³, RCR 0.154892 PROC20 Use of functional fluids in small devices Worker - dermal, long-term - systemic: Exposure 1.7143 mg/kg/day, DNEL 19.8 mg/kg/day, RCR 0.08658 Worker - inhalation, long-term - systemic: Exposure 20.6523 mg/m³, DNEL 40 mg/m³, RCR 0.516308

4. Guidance to check compliance with the exposure scenario (Health 1)

For scaling see <http://www.ecetoc.org/tra>