

according to Regulation UK SI 2019/758 and UK SI 2020/1577 as amended

Creation Date 12-Nov-2009

Revision Date 04-Oct-2023

**Revision Number** 14

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

## 1.1. Product identifier

Product Description:	1-Methyl-2-pyrrolidinone
Cat No. :	390680000; 390680010; 390680025; 390682500
Synonyms	1-Methyl-2-pyrrolidone; N-Methylpyrrolidone; NMP
Index No	606-021-00-7
CAS No	872-50-4
EC No	212-828-1
Molecular Formula	C5 H9 N O
REACH registration number	01-2119472430-46

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

Recommended Use Sector of use	Laboratory chemicals. SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
Product category	PC21 - Laboratory chemicals
Process categories	PROC15 - Use as a laboratory reagent
Environmental release category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Uses advised against	No Information available

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

Company
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UK entity/business name Fisher Scientific UK Bishop Meadow Road, Loughborough, Leicestershire LE11 5RG, United Kingdom

#### EU entity/business name Thermo Fisher Scientific

Janssen Pharmaceuticalaan 3a, 2440 Geel, Belgium

E-mail address

begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11 Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99 **CHEMTREC** Tel. No. **US**:001-800-424-9300 / **Europe**:001-703-527-3887

## **SECTION 2: HAZARDS IDENTIFICATION**

## 2.1. Classification of the substance or mixture

CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

Physical hazards

#### 1-Methyl-2-pyrrolidinone

Based on available data, the classification criteria are not met

## Health hazards

Skin Corrosion/Irritation Serious Eye Damage/Eye Irritation Reproductive Toxicity Specific target organ toxicity - (single exposure)

#### Environmental hazards Based on available data the classification criteria are

Based on available data, the classification criteria are not met

Category 2 (H315) Category 2 (H319) Category 1B (H360D) Category 3 (H335)

Full text of Hazard Statements: see section 16



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 Combustible liquid

## **Precautionary Statements**

P280 - Wear protective gloves/protective clothing/eye protection/face protection
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P312 - Call a POISON CENTER or doctor if you feel unwell
P337 + P313 - If eye irritation persists: Get medical advice/attention

## Additional EU labelling

Restricted to professional users

## 2.3. Other hazards

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)

This product does not contain any known or suspected endocrine disruptors

## **SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

## 3.1. Substances

Component CAS No EC No Weight % CLP Classification - According to					
	Component	CAS No	EC No	Weight %	CLP Classification - According to

## 1-Methyl-2-pyrrolidinone

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				GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567
1-Methyl-2-pyrrolidone	872-50-4	EEC No. 212-828-1	99	Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Repr. 1B (H360D) STOT SE 3 (H335)

Component	Specific concentration limits (SCL's)	M-Factor	Component notes
1-Methyl-2-pyrrolidone	STOT SE 3 (H335) :: C>=10%	-	-

## REACH registration number 01-2119472430-46

#### Full text of Hazard Statements: see section 16

## **SECTION 4: FIRST AID MEASURES**

### 4.1. Description of first aid measures

General Advice	May damage the unborn child. Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.			
Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.			
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.			
Ingestion	Do NOT induce vomiting. Call a physician or poison control center immediately.			
Inhalation	Remove to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.			
Self-Protection of the First Aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.			
4.2. Most important symptoms and effects, both acute and delayed				
	. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting, Central nervous system disorders			

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

Notes to Physician	Treat symptomatically. Symptoms may be delayed.
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## SECTION 5: FIREFIGHTING MEASURES

## 5.1. Extinguishing media

## Suitable Extinguishing Media

Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.

Extinguishing media which must not be used for safety reasons No information available.

## 5.2. Special hazards arising from the substance or mixture

### 1-Methyl-2-pyrrolidinone

Combustible material. Containers may explode when heated. Keep product and empty container away from heat and sources of ignition.

### **Hazardous Combustion Products**

Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>), Nitrogen oxides (NOx), peroxides.

### 5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

## **SECTION 6: ACCIDENTAL RELEASE MEASURES**

#### 6.1. Personal precautions, protective equipment and emergency procedures

Not to be used by pregnant workers and workers who have recently given birth or who are breastfeeding. Ensure adequate ventilation. Use personal protective equipment as required. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas. Remove all sources of ignition. Take precautionary measures against static discharges.

### 6.2. Environmental precautions

Should not be released into the environment.

### 6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition.

#### 6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

## **SECTION 7: HANDLING AND STORAGE**

## 7.1. Precautions for safe handling

Do not get in eyes, on skin, or on clothing. Not to be used by pregnant workers and workers who have recently given birth or who are breastfeeding. Wear personal protective equipment/face protection. Use only under a chemical fume hood. Do not breathe mist/vapors/spray. Do not ingest. If swallowed then seek immediate medical assistance. Keep away from open flames, hot surfaces and sources of ignition.

#### **Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

### 7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame. Protect from light.

Technical Rules for Hazardous Substances (TRGS) 510Class 6.1CStorage Class (LGK) (Germany)Class 6.1C

7.3. Specific end use(s)

Use in laboratories

## **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

## 8.1. Control parameters

### **Exposure limits**

List source(s): EU - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC UK - EH40/2005 Work Exposure Limits, Fourth edition. Published 2020. IRE - 2021 Code of Practice for the Chemical Agents Regulations, Schedule 1. Published by the Health and Safety Authority

Component	The United Kingdom	European Union	Ireland
1-Methyl-2-pyrrolidone	STEL: 20 ppm 15 min	TWA: 40 mg/m <sup>3</sup> (8h)	TWA: 10 ppm 8 hr.
	STEL: 80 mg/m <sup>3</sup> 15 min	TWA: 10 ppm (8h)	TWA: 40 mg/m <sup>3</sup> 8 hr.
	TWA: 10 ppm 8 hr	Skin	STEL: 20 ppm 15 min
	TWA: 40 mg/m <sup>3</sup> 8 hr		STEL: 80 mg/m <sup>3</sup> 15 min
	Skin		Skin
		STEL: 20 ppm (15min)	
		STEL: 80 mg/m <sup>3</sup> (15min)	
		STEL: 80 mg/m <sup>3</sup> (8h)	
		STEL: 20 ppm (8h)	

## **Biological limit values**

List source(s):

#### Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL) See table for values

Component	Acute effects local (Dermal)	Acute effects systemic (Dermal)	Chronic effects local (Dermal)	Chronic effects systemic (Dermal)
1-Methyl-2-pyrrolidone				DNEL = 4.8mg/kg
872-50-4 (99)				bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)	
1-Methyl-2-pyrrolidone 872-50-4 (99)			DNEL = 40mg/m <sup>3</sup>	DNEL = 14.4mg/m <sup>3</sup>	

## **Predicted No Effect Concentration (PNEC)**

See values below.

ſ	Component	Fresh water	Fresh water	Water Intermittent	Microorganisms in	Soil (Agriculture)
			sediment		sewage treatment	
	1-Methyl-2-pyrrolidone 872-50-4(99)	PNEC = 0.25mg/L	PNEC = 1.09mg/kg sediment dw	PNEC = 5mg/L	PNEC = 10mg/L	PNEC = 0.0701mg/kg soil dw

Component	Marine water	Marine water sediment	Marine water intermittent	Food chain	Air
1-Methyl-2-pyrrolidone	PNEC = 0.025mg/L	PNEC =			
872-50-4 ( 99 )		0.109mg/kg			
		sediment dw			

## 8.2. Exposure controls

## 1-Methyl-2-pyrrolidinone

## Engineering Measures

Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

### Personal protective equipment

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber	< 30 minutes	0.38 mm	Level 2	Permeation rate 43 µg/cm2/min
Neoprene	< 140 minutes	0.66 mm	Level 4	Permeation rate 19 µg/cm2/min
•			EN 374	As tested under EN374-3 Determination of
				Resistance to Permeation by Chemicals
Butvl rubber	> 480 minutes	0.50 mm		,

### Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Respiratory Protection	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly
Large scale/emergency use	Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced <b>Recommended Filter type:</b> Organic gases and vapours filter Type A Brown conforming to EN14387
Small scale/Laboratory use	Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. <b>Recommended half mask:-</b> Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141 When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls No information available.

## **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

@ 760 mmHg On basis of test data

Liquid

### 9.1. Information on basic physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Mild amine
Odor Threshold	No data available
Melting Point/Range	-24 °C / -11.2 °F
Softening Point	No data available
Boiling Point/Range	202 °C / 395.6 °F
Flammability (liquid)	Combustible liquid
Flammability (solid,gas)	Not applicable
Explosion Limits	Lower 1.3 vol %

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	Upper 9.5 vol %	
Flash Point	91 °C / 195.8 °F	Method - No information available
	346 °C / 654.8 °F	
Autoignition Temperature		
Decomposition Temperature	No data available	
pH	7.7-8.0	100 g/L aq.sol
Viscosity	1.67 mPa s at 20 °C	
Water Solubility	Miscible	
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/w	vater)	
Component	log Pow	
1-Methyl-2-pyrrolidone	-0.46	
Vapor Pressure	0.7 mbar @ 25 °C	
Density / Specific Gravity	1.030	
Bulk Density	Not applicable	Liquid
Vapor Density	3.4	(Air = 1.0)
Particle characteristics	Not applicable (liquid)	
9.2. Other information		
Molecular Formula	C5 H9 N O	
Molecular Weight	99.13	
Explosive Properties	explosive air/vapour mixtures p	possible
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## **SECTION 10: STABILITY AND REACTIVITY**

10.1. Reactivity	None known, based on information available	
10.2. Chemical stability	Hygroscopic. Air sensitive. Light sensitive.	
10.3. Possibility of hazardous react	ions	
Hazardous Polymerization Hazardous Reactions	No information available. None under normal processing.	
10.4. Conditions to avoid	Incompatible products. Heat, flames and sparks. Exposure to air. Exposure to moist air or water. Exposure to light. Keep away from open flames, hot surfaces and sources of ignition.	
10.5. Incompatible materials	Strong oxidizing agents. Strong acids. Strong bases.	

## 10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO2). Nitrogen oxides (NOx). peroxides.

## **SECTION 11: TOXICOLOGICAL INFORMATION**

## 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

**Product Information** 

1-Methyl-2-pyrrolidinone

(a) acute toxicity; Oral	Based on available data, the classification criteria are not met
Dermal	Based on available data, the classification criteria are not met
Inhalation	Based on available data, the classification criteria are not met

## 1-Methyl-2-pyrrolidinone

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation		
1-Methyl-2-pyrrolidone	LD50 = 3914 mg/kg ( Rat )	LD50 = 8 g/kg (Rabbit)	LC50 > 5.1  mg/L (Rat) 4  h		
(b) skin corrosion/irritation;	Category 2				
(c) serious eye damage/irritation;	Category 2				
(d) respiratory or skin sensitization; Respiratory Skin	Based on available data, the classification criteria are not met Based on available data, the classification criteria are not met				
(e) germ cell mutagenicity;					
	Mutagenic effects have occured in microorganisms				
(f) carcinogenicity;	Based on available data, the classification criteria are not met				
	There are no known carcinogenic chemicals in this product				
(g) reproductive toxicity; Reproductive Effects Developmental Effects Teratogenicity	Category 1B Experiments have shown repr Substances known to cause d unborn child. Teratogenic effects have occu	evelopmental toxicity in humar			
(h) STOT-single exposure;	Category 3				
Results / Target organs	s / Target organs Respiratory system.				
(i) STOT-repeated exposure;	Based on available data, the classification criteria are not met				
Target Organs	None known.				
(j) aspiration hazard;	Based on available data, the classification criteria are not met				
Other Adverse Effects	Tumorigenic effects have been	n reported in experimental anir	nals.		
Symptoms / effects,both acute and delayed	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting, Central nervous system disorders.				
11.2 Information on other hazards					

## 11.2. Information on other hazards

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Endocrine Disrupting Properties
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Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

## **SECTION 12: ECOLOGICAL INFORMATION**

#### 12.1. Toxicity Ecotoxicity effects

Component	Freshwater Fish	Water Flea	Freshwater Algae
1-Methyl-2-pyrrolidone	LC50: = 1400 mg/L, 96h static	EC50: = 4897 mg/L, 48h	EC50: > 500 mg/L, 72h

## 1-Methyl-2-pyrrolidinone

## Revision Date 04-Oct-2023

LC50: (Pin LC50:	Poecilia reticulata) (Daphni = 1072 mg/L, 96h static nephales promelas) = 832 mg/L, 96h static pomis macrochirus)	a magna) (Desmodesmus subspicatus)
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## 12.2. Persistence and degradability

12.2. Persistence and degradability				
Persistence	Persistence is unlikely.			
Component		Degradability		
	1-Methyl-2-pyrrolidone	water: 73% 28 days OECD 301C		
	872-50-4 (99)	soil: >=90% 21 days		

#### 12.3. Bioaccumulative potential Bioaccumulation is unlikely

Component	log Pow	Bioconcentration factor (BCF)
1-Methyl-2-pyrrolidone	-0.46	No data available

<u>12.4. Mobility in soil</u>	The product is water soluble, and may spread in water systems . Will likely be mobile in the environment due to its water solubility. Highly mobile in soils
<u>12.5. Results of PBT and vPvB</u> assessment	Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB).
<u>12.6. Endocrine disrupting</u> properties Endocrine Disruptor Information	This product does not contain any known or suspected endocrine disruptors
12.7. Other adverse effects	This product does not contain any known or supported substance

Persistent Organic Pollutant	This product does not contain any known or suspected substance
Ozone Depletion Potential	This product does not contain any known or suspected substance

## **SECTION 13: DISPOSAL CONSIDERATIONS**

## 13.1. Waste treatment methods

Waste from Residues/Unused Products	Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.
Contaminated Packaging	Dispose of this container to hazardous or special waste collection point.
European Waste Catalogue (EWC)	According to the European Waste Catalog, Waste Codes are not product specific, but application specific.
Other Information	Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains.

## **SECTION 14: TRANSPORT INFORMATION**

IMDG/IMO

Not regulated

14.1. UN number 14.2. UN proper shipping name 14.3. Transport hazard class(es) 14.4. Packing group	
ADR	Not regulated
<u>14.1. UN number</u> <u>14.2. UN proper shipping name</u> <u>14.3. Transport hazard class(es)</u> 14.4. Packing group	
IATA	Not regulated
<u>14.1. UN number</u> <u>14.2. UN proper shipping name</u> <u>14.3. Transport hazard class(es)</u> 14.4. Packing group	
14.5. Environmental hazards	No hazards identified
14.6. Special precautions for user	No special precautions required.
14.7. Maritime transport in bulk according to IMO instruments	Not applicable, packaged goods

## **SECTION 15: REGULATORY INFORMATION**

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

## International Inventories

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
1-Methyl-2-pyrrolidone	872-50-4	212-828-1	-	-	Х	Х	KE-25324	Х	Х
Component	CAS No	TSCA	notific	ventory ation - nactive	DSL	NDSL	AICS	NZIoC	PICCS
1-Methyl-2-pyrrolidone	872-50-4	Х	ACT	IVE	Х	-	Х	Х	Х

Legend: X - Listed '-' - Not Listed KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

### Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	U U	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
1-Methyl-2-pyrrolidone	872-50-4	-	Use restricted. See item 72. (see link for restriction details) Use restricted. See item 30. (see link for restriction details)	SVHC Candidate list - 212-828-1 - Toxic for reproduction, Article 57c

## 1-Methyl-2-pyrrolidinone

#### Revision Date 04-Oct-2023

Use restricted. See item 71. (see link for restriction
details) Use restricted. See item
75. (see link for restriction
details)

After the sunset date the use of this substance requires either an authorization or can only be used for exempted uses, e.g. use in scientific research and development which includes routine analytics or use as intermediate.

#### **REACH links**

https://echa.europa.eu/authorisation-list https://echa.europa.eu/substances-restricted-under-reach https://echa.europa.eu/candidate-list-table

## Seveso III Directive (2012/18/EC)

Component	CAS No	Seveso III Directive (2012/18/EC) -	Seveso III Directive (2012/18/EC) -
		Qualifying Quantities for Major Accident	Qualifying Quantities for Safety Report
		Notification	Requirements
1-Methyl-2-pyrrolidone	872-50-4	Not applicable	Not applicable

# Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)? Not applicable

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 .

Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

Take note of Directive 94/33/EC on the protection of young people at work

Take note of Dir 92/85/EC on the protection of pregnant and breastfeeding women at work

### **National Regulations**

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification

See table for values

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
1-Methyl-2-pyrrolidone	WGK1	

Component	France - INRS (Tables of occupational diseases)
1-Methyl-2-pyrrolidone	Tableaux des maladies professionnelles (TMP) - RG 84

Component	Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81)	Switzerland - Ordinance on Incentive Taxes on Volatile Organic Compounds (OVOC)	Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure
1-Methyl-2-pyrrolidone 872-50-4 (99)		Group I	

### 15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has been conducted

## **SECTION 16: OTHER INFORMATION**

## Full text of H-Statements referred to under sections 2 and 3

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

#### Legend

CAS - Chemical Abstracts Service	<b>TSCA</b> - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances PICCS - Philippines Inventory of Chemicals and Chemical Substances IECSC - Chinese Inventory of Existing Chemical Substances KECL - Korean Existing and Evaluated Chemical Substances	

WEL - Workplace Exposure Limit	TWA - Time Weighted Average
ACGIH - American Conference of Governmental Industrial Hygienists	IARC - International Agency for Research on Cancer
DNEL - Derived No Effect Level	Predicted No Effect Concentration (PNEC)
RPE - Respiratory Protective Equipment	LD50 - Lethal Dose 50%
LC50 - Lethal Concentration 50%	EC50 - Effective Concentration 50%
NOEC - No Observed Effect Concentration	<b>POW</b> - Partition coefficient Octanol:Water
PBT - Persistent, Bioaccumulative, Toxic	vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road IMO/IMDG - International Maritime Organization/International Maritime

Dangerous Goods Code OECD - Organisation for Economic Co-operation and Development

BCF - Bioconcentration factor

## Key literature references and sources for data

https://echa.europa.eu/information-on-chemicals

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Ships

Transport Association

ATE - Acute Toxicity Estimate VOC - (Volatile Organic Compound)

ICAO/IATA - International Civil Aviation Organization/International Air

MARPOL - International Convention for the Prevention of Pollution from

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Chemical incident response training.

Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts.

Creation Date	12-Nov-2009
Revision Date	04-Oct-2023
Revision Summary	Not applicable.

# This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as amended.

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