

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 15.12.2017

Version 15.0

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

1.1 Product identifier

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis
REACH Registration Number	01-2119498301-39-XXXX
CAS-No.	88-12-0

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

Identified uses	Chemical for synthesis In compliance with the conditions described in the annex to this safety data sheet.
-----------------	---

1.3 Details of the supplier of the safety data sheet

Company	Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0
Responsible Department	LS-QHC * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number	Please contact the regional company representation in your country.
--------------------------------	---

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4, Oral, H302

Acute toxicity, Category 4, Inhalation, H332

Acute toxicity, Category 4, Dermal, H312

Serious eye damage, Category 1, H318

Carcinogenicity, Category 2, H351

Specific target organ toxicity - single exposure, Category 3, Respiratory system, H335

Specific target organ toxicity - repeated exposure, Category 2, Liver, H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

Danger

Hazard statements

H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.

H318 Causes serious eye damage.

H335 May cause respiratory irritation.

H351 Suspected of causing cancer.

H373 May cause damage to organs (Liver) through prolonged or repeated exposure.

Precautionary statements

Prevention

P280 Wear eye protection.

Response

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P314 Get medical advice/ attention if you feel unwell.

Reduced labelling (≤ 125 ml)

Hazard pictograms



Signal word

Danger

Hazard statements

H318 Causes serious eye damage.

H351 Suspected of causing cancer.

Precautionary statements

P280 Wear eye protection.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Index-No. 613-168-00-0

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	C ₆ H ₉ NO (Hill)
Index-No.	613-168-00-0
EC-No.	201-800-4
Molar mass	111,14 g/mol

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Hazardous components (REGULATION (EC) No 1272/2008)

Chemical name (Concentration)

CAS-No.	Registration number	Classification
---------	---------------------	----------------

1-vinyl-2-pyrrolidone ($\geq 50\%$ - $\leq 100\%$)

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

88-12-0	01-2119498301-39-
---------	-------------------

XXXX

Acute toxicity, Category 4, H302

Acute toxicity, Category 4, H332

Acute toxicity, Category 4, H312

Serious eye damage, Category 1, H318

Carcinogenicity, Category 2, H351

Specific target organ toxicity - single exposure, Category 3, H335

Specific target organ toxicity - repeated exposure, Category 2,
H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

3.2 Mixture

Not applicable

SECTION 4. First aid measures

4.1 Description of first aid measures

General advice

First aider needs to protect himself.

After inhalation: fresh air. Immediately apply artificial respiration. If necessary oxygen.

Immediately call in physician.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/
shower. Consult a physician.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

Risk of serious damage to eyes.

Irritation and corrosion, Cough, Shortness of breath

4.3 Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water, Foam, Carbon dioxide (CO₂), Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Combustible.

Forms explosive mixtures with air on intense heating.

Vapours are heavier than air and may spread along floors.

Development of hazardous combustion gases or vapours possible in the event of fire.

Fire may cause evolution of:

nitrogen oxides, nitrous gases

5.3 Advice for firefighters

Special protective equipment for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Further information

Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Hygiene measures

Change contaminated clothing. Wash hands and face after working with substance. Work under fume extractor. Under no circumstances eat or drink at workplace.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons.

Recommended storage temperature see product label.

7.3 Specific end use(s)

See exposure scenario in the Annex to this MSDS.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Derived No Effect Level (DNEL)

Worker DMEL, longterm	Systemic effects	inhalation	0,1 mg/m ³
Worker DMEL, longterm	Systemic effects	dermal	0,014 mg/kg Body weight

Predicted No Effect Concentration (PNEC)

PNEC Fresh water	0,045 mg/l
PNEC Marine water	0,0045 mg/l
PNEC Aquatic intermittent release	0,45 mg/l
PNEC Fresh water sediment	0,22 mg/kg
PNEC Marine sediment	0,02 mg/kg
PNEC Soil	0,017 mg/kg
PNEC Sewage treatment plant	3373 mg/l

8.2 Exposure controls

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection

Tightly fitting safety goggles

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Hand protection

full contact:

Glove material:	butyl-rubber
Glove thickness:	0,7 mm
Break through time:	> 480 min

splash contact:

Glove material:	natural latex
Glove thickness:	0,6 mm
Break through time:	> 30 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 898 Butoject® (full contact), KCL 706 Lapren® (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet(>,<)> supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment

protective clothing

Respiratory protection

required when vapours/aerosols are generated.

Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls

Do not let product enter drains.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	liquid
Colour	colourless to brown violet
Odour	characteristic
Odour Threshold	No information available.
pH	9 - 10 at 100 g/l 20 °C
Melting point/range	13 - 14 °C
Boiling point/boiling range	90 - 92 °C at 13 hPa
Boiling point/boiling range	218 °C at 1.013 hPa
Flash point	95 °C Method: DIN 51758
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Lower explosion limit	1,4 %(V)
-----------------------	----------

Upper explosion limit	10 %(V)
-----------------------	---------

Vapour pressure	0,12 hPa at 20 °C
-----------------	----------------------

	1,23 hPa at 50 °C
--	----------------------

Relative vapour density	3,8
-------------------------	-----

Density	1,04 g/cm ³ at 20 °C
---------	------------------------------------

Relative density	No information available.
------------------	---------------------------

Water solubility	52,1 g/l at 25 °C
------------------	----------------------

Partition coefficient: n-octanol/water	log Pow: 0,4 (25 °C) OECD Test Guideline 107 Bioaccumulation is not expected.
--	---

Auto-ignition temperature	No information available.
---------------------------	---------------------------

Decomposition temperature	No information available.
---------------------------	---------------------------

Viscosity, dynamic	2,1 mPa.s at 20 °C
--------------------	-----------------------

	1,7 mPa.s at 50 °C
--	-----------------------

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Explosive properties	Not classified as explosive.
----------------------	------------------------------

Oxidizing properties	none
----------------------	------

9.2 Other data

Ignition temperature	240 °C Method: DIN 51794
----------------------	-----------------------------

SECTION 10. Stability and reactivity

10.1 Reactivity

Forms explosive mixtures with air on intense heating.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

Stabilizer

N,N-di-sec-butyl-1,4-phenylenediamine

10.3 Possibility of hazardous reactions

Violent reactions possible with:

Peroxides, polymerisation initiators, Strong oxidizing agents, acids

10.4 Conditions to avoid

Strong heating.

10.5 Incompatible materials

no information available

10.6 Hazardous decomposition products

in the event of fire: See section 5.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity

LD50 Rat: 1.022 mg/kg

OECD Test Guideline 401

Acute inhalation toxicity

LC50 Rat: 3,07 mg/l; 4 h ; dust/mist

(ECHA)

Symptoms: mucosal irritations, Cough, Shortness of breath, absorption

Acute dermal toxicity

LD50 Rat: 1.043 mg/kg

OECD Test Guideline 402

Skin irritation

Rabbit

Result: No skin irritation

Draize Test

Eye irritation

Causes serious eye damage.

Sensitisation

Buehler Test Guinea pig

Result: negative

Method: OECD Test Guideline 406

Germ cell mutagenicity

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Genotoxicity in vivo

In vivo micronucleus test

Mouse

male and female

Oral

Red blood cells (erythrocytes)

Result: negative

Method: OECD Test Guideline 474

Genotoxicity in vitro

Mutagenicity (mammal cell test): chromosome aberration.

Human lymphocytes

Result: negative

Method: OECD Test Guideline 473

Ames test

Salmonella typhimurium

Result: negative

Method: OECD Test Guideline 471

Carcinogenicity

This information is not available.

Reproductive toxicity

This information is not available.

Teratogenicity

This information is not available.

CMR effects

Carcinogenicity:

Suspected of causing cancer.

Specific target organ toxicity - single exposure

May cause respiratory irritation.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Target Organs: Liver

Repeated dose toxicity

Rat

male and female

Oral

90 d

daily

NOAEL: 1 mg/kg

LOAEL: 2,6 mg/kg

OECD Test Guideline 408

Subchronic toxicity

Rat

male and female

Inhalation

vapour

90 d

daily

NOAEL: 0,005 mg/l

OECD Test Guideline 413

Subchronic toxicity

Aspiration hazard

This information is not available.

11.2 Further information

Systemic effects:

Damage to:

Liver

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

SECTION 12. Ecological information

12.1 Toxicity

Toxicity to fish

static test LC50 *Oncorhynchus mykiss* (rainbow trout): 913 mg/l; 96 h

OECD Test Guideline 203

(above the solubility limit in the test medium)

Toxicity to daphnia and other aquatic invertebrates

static test EC50 *Daphnia magna* (Water flea): 45 mg/l; 48 h

OECD Test Guideline 202

Toxicity to algae

static test EC50 *Desmodesmus subspicatus* (green algae): > 1.000 mg/l; 72 h

OECD Test Guideline 201

(above the solubility limit in the test medium)

static test EC10 *Desmodesmus subspicatus* (green algae): 530 mg/l; 72 h

OECD Test Guideline 201

(above the solubility limit in the test medium)

Toxicity to bacteria

EC20 activated sludge: 1.995 mg/l; 30 min

OECD Test Guideline 209

12.2 Persistence and degradability

Biodegradability

100 %; 28 d; aerobic

OECD Test Guideline 301A

Readily biodegradable

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0,4 (25 °C)

OECD Test Guideline 107

Bioaccumulation is not expected.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

12.6 Other adverse effects

Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 - 14.6	Not classified as dangerous in the meaning of transport regulations.
-------------	--

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 - 14.6	Not classified as dangerous in the meaning of transport regulations.
-------------	--

Sea transport (IMDG)

14.1 - 14.6	Not classified as dangerous in the meaning of transport regulations.
-------------	--

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not relevant

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

SECTION 15. Regulatory information

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

EU regulations

Major Accident Hazard SEVESO III

Legislation Not applicable

Occupational restrictions Take note of Dir 94/33/EC on the protection of young people at work. Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer not regulated

Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC not regulated

Substances of very high concern (SVHC) This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of $\geq 0.1\%$ (w/w).

National legislation

 Storage class 6.1 C

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

SECTION 16. Other information

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

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H318	Causes serious eye damage.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.

Training advice

Provide adequate information, instruction and training for operators.

Labelling

Hazard pictograms



Signal word

Danger

Hazard statements

H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H373 May cause damage to organs (Liver) through prolonged or repeated exposure.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Precautionary statements

Prevention

P280 Wear eye protection.

Response

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P314 Get medical advice/ attention if you feel unwell.

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

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation

This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

EXPOSURE SCENARIO 1 (Industrial use)

1. Industrial use Chemical for synthesis)

Sectors of end-use

<i>SU 3</i>	Industrial uses: Uses of substances as such or in preparations at industrial sites
<i>SU 9</i>	Manufacture of fine chemicals
<i>SU 10</i>	Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)

Chemical product category

<i>PC19</i>	Intermediate
<i>PC21</i>	Laboratory chemicals

Process categories

<i>PROC1</i>	Use in closed process, no likelihood of exposure
<i>PROC2</i>	Use in closed, continuous process with occasional controlled exposure
<i>PROC3</i>	Use in closed batch process (synthesis or formulation)
<i>PROC4</i>	Use in batch and other process (synthesis) where opportunity for exposure arises
<i>PROC5</i>	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)
<i>PROC8a</i>	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
<i>PROC8b</i>	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
<i>PROC9</i>	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
<i>PROC10</i>	Roller application or brushing
<i>PROC15</i>	Use as laboratory reagent

Environmental Release Categories

<i>ERC1</i>	Manufacture of substances
<i>ERC2</i>	Formulation of preparations
<i>ERC4</i>	Industrial use of processing aids in processes and products, not becoming part of articles
<i>ERC6a</i>	Industrial use resulting in manufacture of another substance (use of intermediates)

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

ERC6b Industrial use of reactive processing aids

2. Contributing scenarios: Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure for: PROC1

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 73 °C

Frequency and duration of use

Frequency of use	8 hours/day
Frequency of use	5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with local exhaust ventilation (LEV)
------------------	---

Technical conditions and measures

Provide extraction ventilation at points where emissions occur.

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear eye protection/ face protection. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

2.2 Contributing scenario controlling worker exposure for: PROC2, PROC3

Product characteristics

Concentration of the Substance in	Covers the percentage of the substance in the product up to 100 %.
-----------------------------------	--

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Mixture/Article

Physical Form (at time of use) Low volatile liquid

Process Temperature < 73 °C

Frequency and duration of use

Frequency of use 8 hours/day

Frequency of use 5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor Indoor with local exhaust ventilation (LEV)

Technical conditions and measures

Provide extraction ventilation at points where emissions occur.

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear eye protection/ face protection. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear respiratory protection.

2.3 Contributing scenario controlling worker exposure for: PROC4, PROC5

Product characteristics

Concentration of the Substance in Mixture/Article Covers the percentage of the substance in the product up to 100 %.

Physical Form (at time of use) Low volatile liquid

Process Temperature < 73 °C

Frequency and duration of use

Frequency of use 8 hours/day

Frequency of use 5 days/week

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with local exhaust ventilation (LEV)
------------------	---

Technical conditions and measures

Handle substance within a predominantly closed system provided with extract ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear eye protection/ face protection. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear respiratory protection.

2.4 Contributing scenario controlling worker exposure for: PROC8a, PROC8b

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 73 °C

Frequency and duration of use

Frequency of use	4 hours/day
Frequency of use	5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with local exhaust ventilation (LEV)
------------------	---

Technical conditions and measures

Ensure material transfers are under containment or extract ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 4 hours.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Conditions and measures related to personal protection, hygiene and health evaluation

Wear eye protection/ face protection. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear respiratory protection.

2.5 Contributing scenario controlling worker exposure for: PROC9

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 73 °C

Frequency and duration of use

Frequency of use	4 hours/day
Frequency of use	5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with local exhaust ventilation (LEV)
------------------	---

Technical conditions and measures

Fill containers/cans at dedicated filling points supplied with local extract ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear eye protection/ face protection. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear respiratory protection.

2.6 Contributing scenario controlling worker exposure for: PROC10

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 25 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 73 °C

Frequency and duration of use

Frequency of use	8 hours/day
Frequency of use	5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with local exhaust ventilation (LEV)
------------------	---

Technical conditions and measures

Provide extraction ventilation at points where emissions occur.

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear eye protection/ face protection. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear respiratory protection.

2.7 Contributing scenario controlling worker exposure for: PROC15

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 73 °C

Frequency and duration of use

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 808518
Product name 1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine)
for synthesis

Frequency of use 8 hours/day
Frequency of use 5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor Indoor with local exhaust ventilation (LEV)

Technical conditions and measures

Handle in a fume cupboard or under extract ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear eye protection/ face protection. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear respiratory protection.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard Assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.1	PROC1	longterm, inhalative, local	0,15	ECETOC TRA 2
		longterm, inhalative, systemic	0,15	ECETOC TRA 2
		longterm, dermal, systemic	0,11	ECETOC TRA 2
		longterm, combined, systemic	0,26	
2.2	PROC2, PROC3	longterm, inhalative, local	0,5	ECETOC TRA 2
		longterm, inhalative, systemic	0,5	ECETOC TRA 2
		longterm, dermal, systemic	0,11	EUSES
		longterm, combined, systemic	0,61	

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 808518

Product name 1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine)
for synthesis

2.3	PROC4	longterm, inhalative, local	0,5	ECETOC TRA 2
		longterm, inhalative, systemic	0,5	ECETOC TRA 2
		longterm, dermal, systemic	0,09	EUSES
		longterm, combined, systemic	0,59	
2.3	PROC5	longterm, inhalative, local	0,5	ECETOC TRA 2
		longterm, inhalative, systemic	0,5	ECETOC TRA 2
		longterm, dermal, systemic	0,16	EUSES
		longterm, combined, systemic	0,66	
2.4	PROC8a, PROC8b	longterm, inhalative, local	0,75	ECETOC TRA 2
		longterm, inhalative, systemic	0,75	ECETOC TRA 2
		longterm, dermal, systemic	0,16	EUSES
		longterm, combined, systemic	0,91	
2.5	PROC9	longterm, inhalative, local	0,5	ECETOC TRA 2
		longterm, inhalative, systemic	0,5	ECETOC TRA 2
		longterm, dermal, systemic	0,16	EUSES
		longterm, combined, systemic	0,66	
2.6	PROC10	longterm, inhalative, local	0,02	ECETOC TRA 2
		longterm, inhalative, systemic	0,02	ECETOC TRA 2
		longterm, dermal, systemic	0,15	EUSES
		longterm, combined, systemic	0,17	
2.7	PROC15	longterm, inhalative, local	0,07	ECETOC TRA 2
		longterm, inhalative, systemic	0,07	ECETOC TRA 2
		longterm, dermal, systemic	0,07	EUSES
		longterm, combined, systemic	0,14	

The default parameters and -efficiencies of the applied exposure assessment model were used for the calculation (unless stated differently).

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Guidance Specific Environmental Release Categories (SPERCs).

For scaling of worker exposure assessments performed with ECETOC TRA, please consult the Merck tool SciDeEx® at www.merckmillipore.com/scideex.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

EXPOSURE SCENARIO 2 (Professional use)

1. Professional use Chemical for synthesis)

Sectors of end-use

SU 22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Chemical product category

PC21 Laboratory chemicals

Process categories

PROC15 Use as laboratory reagent

Environmental Release Categories

ERC2 Formulation of preparations

ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)

ERC6b Industrial use of reactive processing aids

2. Contributing scenarios: Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure for: PROC15

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 73 °C

Frequency and duration of use

Frequency of use	8 hours/day
Frequency of use	5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with local exhaust ventilation (LEV)
------------------	---

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 808518
Product name 1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine)
for synthesis

Technical conditions and measures

Handle in a fume cupboard or under extract ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear eye protection/ face protection. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear respiratory protection.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard Assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.1	PROC15	longterm, inhalative, local	0,07	ECETOC TRA 2
		longterm, inhalative, systemic	0,07	ECETOC TRA 2
		longterm, dermal, systemic	0,07	EUSES
		longterm, combined, systemic	0,14	

The default parameters and -efficiencies of the applied exposure assessment model were used for the calculation (unless stated differently).

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The Safety Data Sheets for catalogue items are available at www.merckgroup.com

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

For scaling of worker exposure assessments performed with ECETOC TRA, please consult the Merck tool SciDeEx® at www.merckmillipore.com/scideex.