



# SAFETY DATA SHEET

**MATERION**

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

### 1.1. Product identifier

<b>Trade name or designation of the mixture</b>	Silver BondFlow
<b>Synonyms</b>	None.
<b>Document number</b>	1VX
<b>Materion Code</b>	1VX
<b>Issue date</b>	21-September-2017
<b>Version number</b>	02
<b>Revision date</b>	12-January-2018
<b>Supersedes date</b>	21-September-2017

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

<b>Identified uses</b>	Not available.
<b>Uses advised against</b>	None known.

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

#### Supplier

<b>Company name</b>	Materion Advanced Chemicals Inc.
<b>Address</b>	407 N. 13th Street 1316 W. St. Paul Avenue Milwaukee, WI 53233 United States
<b>Division</b>	Milwaukee
<b>Telephone</b>	414.212.0257
<b>e-mail</b>	advancedmaterials@materion.com
<b>Contact person</b>	Noreen Atkinson

### 1.4. Emergency telephone number

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

The mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

#### Classification according to Regulation (EC) No 1272/2008 as amended

##### Health hazards

Skin corrosion/irritation	Category 2	H315 - Causes skin irritation.
Serious eye damage/eye irritation	Category 2	H319 - Causes serious eye irritation.
Reproductive toxicity (the unborn child)	Category 1B	H360D - May damage the unborn child.
Specific target organ toxicity - single exposure Category 3 respiratory tract irritation		H335 - May cause respiratory irritation.

##### Environmental hazards

Hazardous to the aquatic environment, acute aquatic hazard	Category 1	
Hazardous to the aquatic environment, long-term aquatic hazard	Category 1	H410 - Very toxic to aquatic life with long lasting effects.

#### Hazard summary

Causes serious eye irritation. Causes skin irritation. May cause irritation to the respiratory system. May cause reproductive effects. Dangerous for the environment if discharged into watercourses. Occupational exposure to the substance or mixture may cause adverse health effects. The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated.

### 2.2. Label elements

**Label according to Regulation (EC) No. 1272/2008 as amended****Contains:** RM 1-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.  
 H410 Very toxic to aquatic life with long lasting effects.

**Precautionary statements****Prevention**

P201 Obtain special instructions before use.  
 P202 Do not handle until all safety precautions have been read and understood.  
 P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
 P264 Wash thoroughly after handling.  
 P271 Use only outdoors or in a well-ventilated area.  
 P273 Avoid release to the environment.  
 P280 Wear protective gloves/protective clothing/eye protection/face protection.

**Response**

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.  
 P308 + P313 IF exposed or concerned: Get medical advice/attention.  
 P312 Call a POISON CENTRE/doctor if you feel unwell.  
 P332 + P313 If skin irritation occurs: Get medical advice/attention.  
 P337 + P313 If eye irritation persists: Get medical advice/attention.  
 P362 + P364 Take off contaminated clothing and wash it before reuse.  
 P391 Collect spillage.

**Storage**

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.  
 P405 Store locked up.

**Disposal**

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**Supplemental label information**

None.

**2.3. Other hazards**

None known.

**SECTION 3: Composition/information on ingredients****3.2. Mixtures****General information**

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Silver	35 - 85	7440-22-4 231-131-3	-	-	# M=1000
<b>Classification:</b>	Aquatic Acute 1;H400, Aquatic Chronic 1;H410				
RM 1-methyl-2-pyrrolidone	2 - < 50	872-50-4 212-828-1	-	606-021-00-7	#
<b>Classification:</b>	Skin Irrit. 2;H315, Eye Irrit. 2;H319, STOT SE 3;H335, Repr. 1B;H360D				

**List of abbreviations and symbols that may be used above**

#: This substance has been assigned Union workplace exposure limit(s).  
 M: M-factor  
 PBT: persistent, bioaccumulative and toxic substance.  
 vPvB: very persistent and very bioaccumulative substance.  
 All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

**Composition comments** The full text for all H-statements is displayed in section 16.

## SECTION 4: First aid measures

<b>General information</b>	IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.
<b>4.1. Description of first aid measures</b>	
<b>Inhalation</b>	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTRE or doctor/physician if you feel unwell.
<b>Skin contact</b>	Remove contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
<b>Eye contact</b>	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Rinse mouth. Get medical attention if symptoms occur.
<b>4.2. Most important symptoms and effects, both acute and delayed</b>	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain.
<b>4.3. Indication of any immediate medical attention and special treatment needed</b>	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

## SECTION 5: Firefighting measures

<b>General fire hazards</b>	No unusual fire or explosion hazards noted.
<b>5.1. Extinguishing media</b>	
<b>Suitable extinguishing media</b>	Water spray. Alcohol resistant foam. Powder. Carbon dioxide (CO <sub>2</sub> ).
<b>Unsuitable extinguishing media</b>	Do not use water jet as an extinguisher, as this will spread the fire.
<b>5.2. Special hazards arising from the substance or mixture</b>	During fire, gases hazardous to health may be formed.
<b>5.3. Advice for firefighters</b>	
<b>Special protective equipment for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
<b>Special firefighting procedures</b>	Use water spray to cool unopened containers.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.

## SECTION 6: Accidental release measures

<b>6.1. Personal precautions, protective equipment and emergency procedures</b>	
<b>For non-emergency personnel</b>	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
<b>For emergency responders</b>	Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.
<b>6.2. Environmental precautions</b>	Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
<b>6.3. Methods and material for containment and cleaning up</b>	Prevent entry into waterways, sewer, basements or confined areas.  Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.  Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.  Never return spills to original containers for re-use.
<b>6.4. Reference to other sections</b>	For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices.

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

Store locked up. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

### 7.3. Specific end use(s)

Not available.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational exposure limits

##### Austria. MAK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	MAK	40 mg/m <sup>3</sup>	Vapor.
	STEL	10 ppm	Vapor.
		80 mg/m <sup>3</sup>	Vapor.
Silver (CAS 7440-22-4)	MAK	20 ppm	Vapor.
	STEL	0,1 mg/m <sup>3</sup>	Inhalable fraction.
		0,1 mg/m <sup>3</sup>	Inhalable fraction.

##### Belgium. Exposure Limit Values.

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
	TWA	20 ppm
		40 mg/m <sup>3</sup>
Silver (CAS 7440-22-4)	TWA	10 ppm
		0,1 mg/m <sup>3</sup>

##### Bulgaria. OELs. Regulation No 13 on protection of workers against risks of exposure to chemical agents at work

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
	TWA	20 ppm
		40 mg/m <sup>3</sup>
Silver (CAS 7440-22-4)	TWA	10 ppm
		0,1 mg/m <sup>3</sup>

##### Croatia. Dangerous Substance Exposure Limit Values in the Workplace (ELVs), Annexes 1 and 2, Narodne Novine, 13/09

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	MAC	40 mg/m <sup>3</sup>
	STEL	10 ppm
		80 mg/m <sup>3</sup>
Silver (CAS 7440-22-4)	MAC	20 ppm
		0,1 mg/m <sup>3</sup>

##### Czech Republic. OELs. Government Decree 361

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	Ceiling	80 mg/m <sup>3</sup>
	TWA	40 mg/m <sup>3</sup>
		Ceiling
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

##### Denmark. Exposure Limit Values

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	TLV	20 mg/m <sup>3</sup>	
		5 ppm	

**Denmark. Exposure Limit Values Components**

Components	Type	Value	Form
Silver (CAS 7440-22-4)	TLV	0,01 mg/m <sup>3</sup>	Dust.

**Estonia. OELs. Occupational Exposure Limits of Hazardous Substances. (Annex of Regulation No. 293 of 18 September 2001)**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
		20 ppm
	TWA	40 mg/m <sup>3</sup> 10 ppm
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**Finland. Workplace Exposure Limits Components**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
		20 ppm
	TWA	40 mg/m <sup>3</sup> 10 ppm
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984 Components**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	VLE	80 mg/m <sup>3</sup>
		20 ppm
	VME	40 mg/m <sup>3</sup> 10 ppm
Silver (CAS 7440-22-4)	VME	0,1 mg/m <sup>3</sup>

**Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG)**

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	TWA	82 mg/m <sup>3</sup>	Vapor and aerosol.
		20 ppm	Vapor and aerosol.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	Inhalable fraction.

**Germany. TRGS 900, Limit Values in the Ambient Air at the Workplace Components**

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	AGW	82 mg/m <sup>3</sup>	Vapor.
		20 ppm	Vapor.
Silver (CAS 7440-22-4)	AGW	0,1 mg/m <sup>3</sup>	Inhalable fraction.

**Greece. OELs (Decree No. 90/1999, as amended) Components**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
		20 ppm
	TWA	40 mg/m <sup>3</sup> 10 ppm
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**Hungary. OELs. Joint Decree on Chemical Safety of Workplaces Components**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
		40 mg/m <sup>3</sup>
Silver (CAS 7440-22-4)	STEL	0,4 mg/m <sup>3</sup>
	TWA	0,1 mg/m <sup>3</sup>

**Iceland. OELs. Regulation 154/1999 on occupational exposure limits**

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3	
	TWA	20 ppm 40 mg/m3	
Silver (CAS 7440-22-4)	TWA	10 ppm 0,01 mg/m3	Dust.

**Ireland. Occupational Exposure Limits**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3
	TWA	20 ppm 40 mg/m3
Silver (CAS 7440-22-4)	TWA	10 ppm 0,1 mg/m3

**Italy. Occupational Exposure Limits**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3
	TWA	20 ppm 40 mg/m3
Silver (CAS 7440-22-4)	TWA	10 ppm 0,1 mg/m3

**Latvia. OELs. Occupational exposure limit values of chemical substances in work environment**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3
	TWA	20 ppm 40 mg/m3
Silver (CAS 7440-22-4)	TWA	10 ppm 0,1 mg/m3

**Lithuania. OELs. Limit Values for Chemical Substances, General Requirements**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3
	TWA	20 ppm 40 mg/m3
Silver (CAS 7440-22-4)	TWA	10 ppm 0,1 mg/m3

**Luxembourg. Binding Occupational exposure limit values (Annex I), Memorial A**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3
	TWA	20 ppm 40 mg/m3
Silver (CAS 7440-22-4)	TWA	10 ppm

**Malta. OELs. Occupational Exposure Limit Values (L.N. 227. of Occupational Health and Safety Authority Act (CAP. 424), Schedules I and V)**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3
	TWA	20 ppm 40 mg/m3
Silver (CAS 7440-22-4)	TWA	10 ppm 0,1 mg/m3

**Netherlands. OELs (binding)**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3

**Netherlands. OELs (binding)**

Components	Type	Value
Silver (CAS 7440-22-4)	TWA	40 mg/m <sup>3</sup>
	TWA	0,1 mg/m <sup>3</sup>

**Norway. Administrative Norms for Contaminants in the Workplace**

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>	
	TLV	20 ppm	
		20 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TLV	0,1 mg/m <sup>3</sup>	Dust and fume.

**Poland. MACs. Regulation regarding maximum permissible concentrations and intensities of harmful factors in the work environment, Annex 1**

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	40 mg/m <sup>3</sup>	Inhalable fraction.
	TWA	0,05 mg/m <sup>3</sup>	

**Portugal. OELs. Decree-Law n. 290/2001 (Journal of the Republic - 1 Series A, n.266)**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
	TWA	20 ppm
		40 mg/m <sup>3</sup>
		10 ppm

**Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796)**

Components	Type	Value
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**Romania. OELs. Protection of workers from exposure to chemical agents at the workplace**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
	TWA	20 ppm
		40 mg/m <sup>3</sup>
		10 ppm
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
	TWA	20 ppm
		40 mg/m <sup>3</sup>
		10 ppm
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)**

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	TWA	40 mg/m <sup>3</sup>	Vapor.
Silver (CAS 7440-22-4)	TWA	10 ppm	Vapor.
		0,01 mg/m <sup>3</sup>	

**Spain. Occupational Exposure Limits**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
	TWA	20 ppm
		40 mg/m <sup>3</sup>
		10 ppm

**Spain. Occupational Exposure Limits Components**

Components	Type	Value
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**Sweden. OELs. Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2015:7) Components**

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	Ceiling	80 mg/m <sup>3</sup>	
	TWA	20 ppm 40 mg/m <sup>3</sup>	
	TWA	10 ppm 0,1 mg/m <sup>3</sup>	Total dust.

**Switzerland. SUVA Grenzwerte am Arbeitsplatz Components**

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	160 mg/m <sup>3</sup>	
	TWA	40 ppm 80 mg/m <sup>3</sup>	
	TWA	20 ppm 0,8 mg/m <sup>3</sup>	Inhalable dust.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	Inhalable dust.

**UK. EH40 Workplace Exposure Limits (WELs) Components**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
	TWA	20 ppm 40 mg/m <sup>3</sup>
	TWA	10 ppm 0,1 mg/m <sup>3</sup>

**EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU Components**

Components	Type	Value
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m <sup>3</sup>
	TWA	20 ppm 40 mg/m <sup>3</sup>
	TWA	10 ppm 0,1 mg/m <sup>3</sup>

**Biological limit values****Germany. TRGS 903, BAT List (Biological Limit Values)**

Components	Value	Determinant	Specimen	Sampling time
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	150 mg/l	5-Hydroxy-N-methyl-2-pyrrolidone	Urine	*

\* - For sampling details, please see the source document.

**Spain. Biological Limit Values (VLBs), Occupational Exposure Limits for Chemical Agents, Table 4**

Components	Value	Determinant	Specimen	Sampling time
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	70 mg/g	5-hidroxi-N-metil-2-pirrolidona	Creatinine in urine	*
	20 mg/g	2-hidroxi-N-metilsuccinimida	Creatinine in urine	*

\* - For sampling details, please see the source document.

**Recommended monitoring procedures**

Follow standard monitoring procedures.

**Derived no effect levels (DNELs)**

Not available.

**Predicted no effect concentrations (PNECs)**

Not available.



## Exposure guidelines

### EU Exposure Limit Values: Skin designation

RM 1-methyl-2-pyrrolidone (CAS 872-50-4)

Can be absorbed through the skin.

### Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

RM 1-methyl-2-pyrrolidone (CAS 872-50-4)

Can be absorbed through the skin.

## 8.2. Exposure controls

### Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

### Individual protection measures, such as personal protective equipment

#### General information

Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

#### Eye/face protection

Wear safety glasses with side shields (or goggles).

#### Skin protection

##### - Hand protection

Wear appropriate chemical resistant gloves.

##### - Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

#### Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.

#### Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

### Hygiene measures

Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

### Environmental exposure controls

Inform appropriate managerial or supervisory personnel of all environmental releases.

## SECTION 9: Physical and chemical properties

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

#### Appearance

##### Physical state

Solid.

##### Form

Solid.

##### Colour

Not available.

#### Odour

Not available.

#### Odour threshold

Not available.

#### pH

Not available.

#### Melting point/freezing point

-25 °C (-13 °F) estimated

#### Initial boiling point and boiling range

202 °C (395,6 °F) estimated

#### Flash point

95,6 °C (204,0 °F) estimated

#### Evaporation rate

Not available.

#### Flammability (solid, gas)

Not available.

#### Upper/lower flammability or explosive limits

##### Flammability limit - lower (%)

Not available.

##### Flammability limit - upper (%)

Not available.

#### Vapour pressure

0,17 hPa estimated

#### Vapour density

Not available.

#### Relative density

Not available.

#### Solubility(ies)

##### Solubility (water)

Not available.

#### Partition coefficient (n-octanol/water)

Not available.

#### Auto-ignition temperature

346,11 °C (655 °F) estimated

#### Decomposition temperature

Not available.

<b>Viscosity</b>	Not available.
<b>Explosive properties</b>	Not explosive.
<b>Oxidising properties</b>	Not oxidising.

## 9.2. Other information

<b>Density</b>	7,01 g/cm <sup>3</sup> estimated
<b>Specific gravity</b>	7,01 estimated

## SECTION 10: Stability and reactivity

<b>10.1. Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>10.2. Chemical stability</b>	Material is stable under normal conditions.
<b>10.3. Possibility of hazardous reactions</b>	No dangerous reaction known under conditions of normal use.
<b>10.4. Conditions to avoid</b>	Avoid temperatures exceeding the flash point. Contact with incompatible materials.
<b>10.5. Incompatible materials</b>	Ammonia. Peroxides. Chlorine. Phenols.
<b>10.6. Hazardous decomposition products</b>	No hazardous decomposition products are known.

## SECTION 11: Toxicological information

**General information** Occupational exposure to the substance or mixture may cause adverse effects.

### Information on likely routes of exposure

<b>Inhalation</b>	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
<b>Skin contact</b>	Causes skin irritation.
<b>Eye contact</b>	Causes serious eye irritation.
<b>Ingestion</b>	May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure.

**Symptoms** Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain.

### 11.1. Information on toxicological effects

<b>Acute toxicity</b>	No data available.
<b>Skin corrosion/irritation</b>	Causes skin irritation.
<b>Serious eye damage/eye irritation</b>	Causes serious eye irritation.
<b>Respiratory sensitisation</b>	Due to partial or complete lack of data the classification is not possible.
<b>Skin sensitisation</b>	Due to partial or complete lack of data the classification is not possible.
<b>Germ cell mutagenicity</b>	Due to partial or complete lack of data the classification is not possible.
<b>Carcinogenicity</b>	Due to partial or complete lack of data the classification is not possible.
<b>Hungary. 26/2000 EüM Ordinance on protection against and preventing risk relating to exposure to carcinogens at work (as amended)</b>	
	Not listed.
<b>Reproductive toxicity</b>	May damage the unborn child.
<b>Specific target organ toxicity - single exposure</b>	May cause respiratory irritation.
<b>Specific target organ toxicity - repeated exposure</b>	Due to partial or complete lack of data the classification is not possible.
<b>Aspiration hazard</b>	Due to partial or complete lack of data the classification is not possible.
<b>Mixture versus substance information</b>	No information available.
<b>Other information</b>	Not available.

## SECTION 12: Ecological information

**12.1. Toxicity** Very toxic to aquatic life with long lasting effects.

Components	Species	Test results
Silver (CAS 7440-22-4)		
<b>Aquatic</b>		
Crustacea	EC50 Water flea (Daphnia magna)	0,0002 mg/l, 48 hours

Components	Species	Test results
Fish	LC50	Fathead minnow ( <i>Pimephales promelas</i> ) 0,0023 - 0,0033 mg/l, 96 hours

\* Estimates for product may be based on additional component data not shown.

**12.2. Persistence and degradability** No data is available on the degradability of this product.

**12.3. Bioaccumulative potential**

**Partition coefficient n-octanol/water (log Kow)**

RM 1-methyl-2-pyrrolidone -0,54

**Bioconcentration factor (BCF)** Not available.

**12.4. Mobility in soil** No data available.

**12.5. Results of PBT and vPvB assessment** Not available.

**12.6. Other adverse effects** No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

**Residual waste** Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging** Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

**EU waste code** The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**Disposal methods/information** Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Special precautions** Dispose in accordance with all applicable regulations.

## SECTION 14: Transport information

### ADR

**14.1. UN number** UN3077

**14.2. UN proper shipping name** Environmentally hazardous substance, solid, n.o.s. (Silver)

**14.3. Transport hazard class(es)**

**Class** 9

**Subsidiary risk** -

**Label(s)** 9

**Hazard No. (ADR)** 90

**Tunnel restriction code** E

**14.4. Packing group** III

**14.5. Environmental hazards** Yes

**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.

### RID

**14.1. UN number** UN3077

**14.2. UN proper shipping name** Environmentally hazardous substance, solid, n.o.s. (Silver)

**14.3. Transport hazard class(es)**

**Class** 9

**Subsidiary risk** -

**Label(s)** 9

**14.4. Packing group** III

**14.5. Environmental hazards** Yes

**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.

**ADN**

**14.1. UN number** UN3077  
**14.2. UN proper shipping name** Environmentally hazardous substance, solid, n.o.s. (Silver)  
**14.3. Transport hazard class(es)**  
    **Class** 9  
    **Subsidiary risk** -  
    **Label(s)** 9  
**14.4. Packing group** III  
**14.5. Environmental hazards** Yes

**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.

**IATA**

**14.1. UN number** UN3077  
**14.2. UN proper shipping name** Environmentally hazardous substance, solid, n.o.s. (Silver)  
**14.3. Transport hazard class(es)**  
    **Class** 9  
    **Subsidiary risk** -  
**14.4. Packing group** III  
**14.5. Environmental hazards** Yes

**ERG Code** 9L  
**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.

**Other information**

**Passenger and cargo aircraft** Allowed with restrictions.  
**Cargo aircraft only** Allowed with restrictions.

**IMDG**

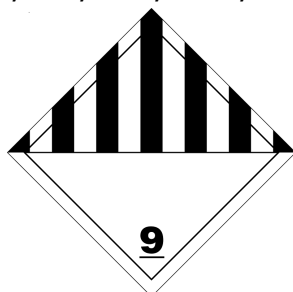
**14.1. UN number** UN3077  
**14.2. UN proper shipping name** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Silver), MARINE POLLUTANT  
**14.3. Transport hazard class(es)**  
    **Class** 9  
    **Subsidiary risk** -  
**14.4. Packing group** III  
**14.5. Environmental hazards**

**Marine pollutant** Yes

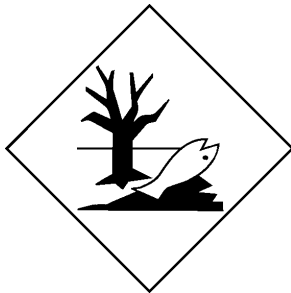
**EmS** F-A, S-F

**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.

**ADN; ADR; IATA; IMDG; RID**



## Marine pollutant



### General information

IMDG Regulated Marine Pollutant.

## SECTION 15: Regulatory information

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

#### EU regulations

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended**

Not listed.

**Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended**

Not listed.

**Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended**

Not listed.

**Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA**

RM 1-methyl-2-pyrrolidone (CAS 872-50-4)

#### Authorisations

**Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended**

Not listed.

#### Restrictions on use

**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended**

RM 1-methyl-2-pyrrolidone (CAS 872-50-4)

**Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.**

Not listed.

#### Other EU regulations

**Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended**

Not listed.

#### Other regulations

Pregnant women should not work with the product, if there is the least risk of exposure. The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.

#### National regulations

Follow national regulation for work with chemical agents. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended.

### 15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

## SECTION 16: Other information

### List of abbreviations

Not available.

**Information on evaluation method leading to the classification of mixture**

**Disclaimer**

The classification for health and environmental hazards is derived by a combination of calculator methods and test data, if available.

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