



SAFETY DATA SHEET

MATERION

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

1.1. Product identifier

Trade name or designation of the mixture	FM901:Ag
Synonyms	None.
Document number	1VT
Materion Code	1VT
Issue date	08-March-2017
Version number	02
Revision date	12-January-2018
Supersedes date	08-March-2017

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

Identified uses	Not available.
Uses advised against	None known.

1.3. Details of the supplier of the safety data sheet

Supplier

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

1.4. Emergency telephone number

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Health hazards

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Reproductive toxicity (the unborn child)	Category 1B
Specific target organ toxicity - single exposure	Category 3 respiratory tract irritation

Environmental hazards

Hazardous to the aquatic environment, acute aquatic hazard	Category 1
Hazardous to the aquatic environment, long-term aquatic hazard	Category 1

Hazard summary Not available.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains:	RM 1-methyl-2-pyrrolidone
Hazard pictograms	None.
Signal word	None.
Hazard statements	The mixture does not meet the criteria for classification.

Precautionary statements

Prevention	Not available.
Response	Not available.

Storage	Not available.
Disposal	Not available.
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
RM 1-methyl-2-pyrrolidone	< 50	872-50-4 212-828-1	-	606-021-00-7	#
Classification:	Skin Irrit. 2;H315, Eye Irrit. 2;H319, STOT SE 3;H335, Repr. 1B;H360D				
Silver	45 - 50	7440-22-4 231-131-3	-	-	# M=1000
Classification:	Aquatic Acute 1;H400, Aquatic Chronic 1;H410				

SECTION 4: First aid measures

General information Not available.

4.1. Description of first aid measures

Inhalation Not available.

Skin contact Not available.

Eye contact Not available.

Ingestion Not available.

4.2. Most important symptoms and effects, both acute and delayed Not available.

4.3. Indication of any immediate medical attention and special treatment needed Not available.

SECTION 5: Firefighting measures

General fire hazards Not available.

5.1. Extinguishing media

Suitable extinguishing media Not available.

Unsuitable extinguishing media Not available.

5.2. Special hazards arising from the substance or mixture Not available.

5.3. Advice for firefighters

Special protective equipment for firefighters Not available.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Not available.

For emergency responders Not available.

6.2. Environmental precautions Not available.

6.3. Methods and material for containment and cleaning up Not available.

6.4. Reference to other sections Not available.

SECTION 7: Handling and storage

7.1. Precautions for safe handling Not available.

7.2. Conditions for safe storage, including any incompatibilities Not available.

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 ³	Vapor.
	STEL	10 ppm	Vapor.
		80 mg/m ³	Vapor.
Silver (CAS 7440-22-4)	MAK	20 ppm	Vapor.
	STEL	0,1 mg/m ³	Inhalable fraction.
		0,1 mg/m ³	Inhalable fraction.

Belgium. Exposure Limit Values.

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

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 ³
	TWA	20 ppm
		40 mg/m ³
Silver (CAS 7440-22-4)	TWA	10 ppm
		0,1 mg/m ³

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 ³
	STEL	10 ppm
		80 mg/m ³
Silver (CAS 7440-22-4)	MAC	20 ppm
		0,1 mg/m ³

Czech Republic. OELs. Government Decree 361

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

Denmark. Exposure Limit Values

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	TLV	20 mg/m ³	
		5 ppm	
Silver (CAS 7440-22-4)	TLV	0,01 mg/m ³	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 ³
		20 ppm
Silver (CAS 7440-22-4)	TWA	40 mg/m ³
		10 ppm
	TWA	0,1 mg/m ³

Finland. Workplace Exposure Limits

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

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

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

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 ³	Vapor and aerosol.
		20 ppm	Vapor and aerosol.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³	Inhalable fraction.

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

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

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

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

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

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

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/m ³	
		20 ppm	
	TWA	40 mg/m ³	
		10 ppm	

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

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

Ireland. Occupational Exposure Limits Components

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

Italy. Occupational Exposure Limits Components

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

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

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

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

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

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

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

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/m ³
	TWA	20 ppm
		40 mg/m ³
Silver (CAS 7440-22-4)	TWA	10 ppm 0,1 mg/m ³

Netherlands. OELs (binding) Components

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

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 ³	
		20 ppm	
	TLV	20 mg/m ³	
Silver (CAS 7440-22-4)	TLV	5 ppm 0,1 mg/m ³	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 ³	
Silver (CAS 7440-22-4)	TWA	40 mg/m ³	Inhalable fraction.
	TWA	0,05 mg/m ³	

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

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

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

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

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

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

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

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

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 ³	Vapor.
Silver (CAS 7440-22-4)	TWA	10 ppm	Vapor.
		0,01 mg/m ³	

Spain. Occupational Exposure Limits

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

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

Components	Type	Value	Form
RM 1-methyl-2-pyrrolidone (CAS 872-50-4)	Ceiling	80 mg/m ³	
	TWA	20 ppm	
		40 mg/m ³	
Silver (CAS 7440-22-4)	TWA	10 ppm 0,1 mg/m ³	Total dust.

Switzerland. SUVA Grenzwerte am Arbeitsplatz

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

UK. EH40 Workplace Exposure Limits (WELs)

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

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

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

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 Not available.

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 Not available.

Individual protection measures, such as personal protective equipment

General information Not available.

Eye/face protection Not available.

Skin protection

- **Hand protection** Not available.

- **Other** Not available.

Respiratory protection Not available.

Thermal hazards Not available.

Hygiene measures Not available.

Environmental exposure controls Not available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state Solid.

Form Not available.

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 0,23 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.

Viscosity Not available.

Explosive properties Not available.

Oxidising properties Not available.

9.2. Other information

Density 5,78 g/cm³ estimated

Specific gravity 5,78 estimated

SECTION 10: Stability and reactivity

10.1. Reactivity Not available.

10.2. Chemical stability Not available.

10.3. Possibility of hazardous reactions Not available.

10.4. Conditions to avoid Not available.

10.5. Incompatible materials Not available.

10.6. Hazardous decomposition products Not available.

SECTION 11: Toxicological information

General information Not available.

Information on likely routes of exposure

Inhalation Not available.

Skin contact Not available.

Eye contact Not available.

Ingestion Not available.

Symptoms Not available.

11.1. Information on toxicological effects

Acute toxicity No data available.

Skin corrosion/irritation Not available.

Serious eye damage/eye irritation Not available.

Respiratory sensitisation Not available.

Skin sensitisation Not available.

Germ cell mutagenicity Not available.

Carcinogenicity

Hungary. 26/2000 EüM Ordinance on protection against and preventing risk relating to exposure to carcinogens at work (as amended)

Not listed.

Reproductive toxicity Not available.

Specific target organ toxicity - single exposure Not available.

Specific target organ toxicity - repeated exposure Not available.

Aspiration hazard Not available.

Mixture versus substance information Not available.

Other information Not available.

SECTION 12: Ecological information

12.1. Toxicity

Components	Species	Test results
Silver (CAS 7440-22-4)		
Aquatic		
Crustacea	EC50	Water flea (Daphnia magna) 0,0002 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas) 0,0023 - 0,0033 mg/l, 96 hours

12.2. Persistence and degradability Not available.

12.3. Bioaccumulative potential Not available.

Partition coefficient n-octanol/water (log Kow)

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

Bioconcentration factor (BCF) Not available.

12.4. Mobility in soil Not available.

12.5. Results of PBT and vPvB assessment Not a PBT or vPvB substance or mixture.

12.6. Other adverse effects Not available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste Not available.
Contaminated packaging Not available.
EU waste code Not available.

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 Not available.
14.4. Packing group III
14.5. Environmental hazards Yes
14.6. Special precautions for user Not available.

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 Not available.

ADN

14.1. UN number UN3077
14.2. UN proper shipping name Environmentally Hazardous 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 Not available.

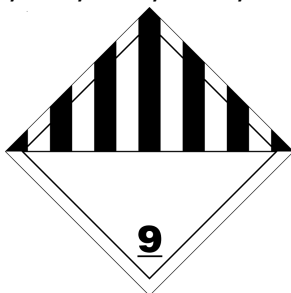
IATA

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 Not available.
Other information
Passenger and cargo aircraft Allowed with restrictions.
Cargo aircraft only Allowed with restrictions.

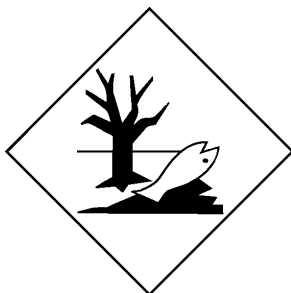
IMDG

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	Not available.

ADN; ADR; IATA; IMDG; RID



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.

National regulations Not available.

15.2. Chemical safety assessment Not available.

SECTION 16: Other information

List of abbreviations Not available.

Information on evaluation method leading to the classification of mixture Not available.