Safety Data Sheet according to Regulation (EC) No 1907/2006

SDS No. : 588906
V002.0

LOCTITE ABLESTIK EMI 8880S

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

1.1. Product identifier
LOCTITE ABLESTIK EMI 8880S

Contains:
Nickel powder [particle diameter < 1 mm]

1.2. Relevant identified uses of the substance or mixture and uses advised against
Intended use:
Conductive coating

1.3. Details of the supplier of the safety data sheet
Henkel Ltd
Wood Lane End
HP2 4RQ Hemel Hempstead

Great Britain

Phone: +44 1442 278000
Fax-no.: +44 1442 278071

ua-productsafety.uk@henkel.com

1.4. Emergency telephone number
24 Hours Emergency Tel: +44 (0)1442 278497

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (CLP):

Flammable liquids	Category 3
H226 Flammable liquid and vapor.	
Serious eye irritation	Category 2
H319 Causes serious eye irritation.	
Skin sensitizer	Category 1
H317 May cause an allergic skin reaction.	
Carcinogenicity	Category 2
H351 Suspected of causing cancer.	
Specific target organ toxicity - repeated exposure	Category 2
H373 May cause damage to organs through prolonged or repeated exposure.	
Acute hazards to the aquatic environment	Category 1
H400 Very toxic to aquatic life.	
Chronic hazards to the aquatic environment	Category 1
H410 Very toxic to aquatic life with long lasting effects.	

2.2. Label elements

Label elements (CLP):

Hazard pictogram:	
Signal word:	Warning
Hazard statement:	H226 Flammable liquid and vapor. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H351 Suspected of causing cancer. H373 May cause damage to organs through prolonged or repeated exposure. H410 Very toxic to aquatic life with long lasting effects.
Precautionary statement: Prevention	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P273 Avoid release to the environment. P280 Wear protective gloves/protective clothing.
Precautionary statement: Response	P333+P313 If skin irritation or rash occurs: Get medical advice/attention. P337+P313 If eye irritation persists: Get medical advice/attention.
Precautionary statement: Storage	P403+P235 Store in a well-ventilated place. Keep cool.

2.3. Other hazards
None if used properly.
Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Declaration of the ingredients according to CLP (EC) No 1272/2008:

Hazardous components CAS-No.	EC Number REACH-Reg No.	content	Classification
Silver Nano Powder 7440-22-4	231-131-3	50- 100 %	Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M factor (Acute Aquat Tox): 1.000 M factor (Chron Aquat Tox): 100
manganese ferrite black spinel 68186-94-7	269-056-3	1- < 5 %	
2-(2-Butoxyethoxy)ethanol 112-34-5	203-961-6 01-2119475104-44	5- < 10 %	Eye Irrit. 2 H319
Iron 7439-89-6	231-096-4 01-2119462838-24	5- < 10 %	Flam. Sol. 2 H228
2-Butoxyethanol 111-76-2	203-905-0 01-2119475108-36	5- < 10 %	Acute Tox. 4; Inhalation H332 Acute Tox. 4; Dermal H312 Acute Tox. 4; Oral H302 Eye Irrit. 2 H319 Skin Irrit. 2 H315
Nickel powder [particle diameter < 1 mm] 7440-02-0	231-111-4 01-2119438727-29	1- < 5 %	STOT RE 1 H372 Skin Sens. 1 H317 Aquatic Chronic 3 H412 Carc. 2 H351
n-Butyl acetate 123-86-4	204-658-1 01-2119485493-29	1- < 5 %	Flam. Liq. 3 H226 STOT SE 3 H336

For full text of the H - statements and other abbreviations see section 16 "Other information".
Substances without classification may have community workplace exposure limits available.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Should not be a problem as product is of low volatility. However, if feeling unwell remove patient to fresh air.

Skin contact:
Rinse with running water and soap.
Obtain medical attention if irritation persists.

Eye contact:
Rinse immediately with plenty of running water (for 10 minutes), seek medical attention from a specialist.

Ingestion:
Rinse mouth, drink 1-2 glasses of water, do not induce vomiting, consult a doctor.

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

EYE: Irritation, conjunctivitis.

SKIN: Rash, Urticaria.

Prolonged or repeated skin contact with silver and its salts may cause a blue-gray discoloration of the skin and mucous membranes that is irreversible (Argyria).

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media:
water, carbon dioxide, foam, powder

Extinguishing media which must not be used for safety reasons:
High pressure waterjet

5.2. Special hazards arising from the substance or mixture
In the event of a fire, carbon monoxide (CO) and carbon dioxide (CO2) can be released.

5.3. Advice for firefighters
Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.

Additional information:
In case of fire, keep containers cool with water spray.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Avoid contact with skin and eyes.
Wear protective equipment.
Ensure adequate ventilation.
Remove sources of ignition.

6.2. Environmental precautions
Do not empty into drains / surface water / ground water.

6.3. Methods and material for containment and cleaning up
For small spills wipe up with paper towel and place in container for disposal.
For large spills absorb onto inert absorbent material and place in sealed container for disposal.

6.4. Reference to other sections
See advice in section 8

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Avoid skin and eye contact.
Keep away from sources of ignition - no smoking.
See advice in section 8

Hygiene measures:
Good industrial hygiene practices should be observed.
Wash hands before work breaks and after finishing work.
Do not eat, drink or smoke while working.

7.2. Conditions for safe storage, including any incompatibilities
Ensure good ventilation/extraction.
Keep container tightly sealed.
Refer to Technical Data Sheet

7.3. Specific end use(s)
Conductive coating

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits

Valid for
Great Britain

Ingredient [Regulated substance]	ppm	mg/m³	Value type	Short term exposure limit category / Remarks	Regulatory list
Silver 7440-22-4 [SILVER (METALLIC)]		0,1	Time Weighted Average (TWA):		EH40 WEL
Silver 7440-22-4 [SILVER, METALLIC]		0,1	Time Weighted Average (TWA):	Indicative	ECTLV
2-(2-Butoxyethoxy)ethanol 112-34-5 [2-(2-BUTOXYETHOXY)ETHANOL]	10	67,5	Time Weighted Average (TWA):		EH40 WEL
2-(2-Butoxyethoxy)ethanol 112-34-5 [2-(2-BUTOXYETHOXY)ETHANOL]	15	101,2	Short Term Exposure Limit (STEL):		EH40 WEL
2-(2-Butoxyethoxy)ethanol 112-34-5 [2-(2-BUTOXYETHOXY)ETHANOL]	10	67,5	Time Weighted Average (TWA):	Indicative	ECTLV
2-(2-Butoxyethoxy)ethanol 112-34-5 [2-(2-BUTOXYETHOXY)ETHANOL]	15	101,2	Short Term Exposure Limit (STEL):	Indicative	ECTLV
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL]			Skin designation:	Can be absorbed through the skin.	EH40 WEL
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL]	50	246	Short Term Exposure Limit (STEL):		EH40 WEL
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL]	25	123	Time Weighted Average (TWA):		EH40 WEL
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL]	20	98	Time Weighted Average (TWA):	Indicative	ECTLV
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL]	50	246	Short Term Exposure Limit (STEL):	Indicative	ECTLV
Nickel 7440-02-0 [NICKEL AND ITS INORGANIC COMPOUNDS (EXCEPT NICKEL TETRACARBONYL): NICKEL AND WATER-INSOLUBLE NICKEL COMPOUNDS (AS NI)]		0,5	Time Weighted Average (TWA):		EH40 WEL
Nickel 7440-02-0 [NICKEL AND ITS INORGANIC COMPOUNDS (EXCEPT NICKEL TETRACARBONYL): NICKEL AND WATER-INSOLUBLE NICKEL COMPOUNDS (AS NI)]			Skin designation:	Can be absorbed through the skin.	EH40 WEL
Manganese ferrite black spinel 68186-94-7 [MANGANESE AND ITS INORGANIC COMPOUNDS (AS MN)]		0,5	Time Weighted Average (TWA):		EH40 WEL
Manganese ferrite black spinel 68186-94-7 [MANGANESE AND INORGANIC MANGANESE COMPOUNDS (AS MN) (INHALABLE FRACTION)]		0,2	Time Weighted Average (TWA):	Indicative	ECTLV
Manganese ferrite black spinel 68186-94-7 [MANGANESE AND INORGANIC MANGANESE COMPOUNDS (AS MN) (RESPIRABLE FRACTION)]		0,05	Time Weighted Average (TWA):	Indicative	ECTLV
n-Butyl acetate 123-86-4	200	966	Short Term Exposure Limit (STEL):		EH40 WEL

[BUTYL ACETATE]					
n-Butyl acetate 123-86-4 [BUTYL ACETATE]	150	724	Time Weighted Average (TWA):		EH40 WEL

Occupational Exposure Limits

Valid for
Ireland

Ingredient [Regulated substance]	ppm	mg/m³	Value type	Short term exposure limit category / Remarks	Regulatory list
Silver 7440-22-4 [SILVER (METALLIC)]		0,1	Time Weighted Average (TWA):	Indicative OELV	IR_OEL
Silver 7440-22-4 [SILVER, METALLIC]		0,1	Time Weighted Average (TWA):	Indicative	ECTLV
2-(2-Butoxyethoxy)ethanol 112-34-5 [2-(2-BUTOXYETHOXY)ETHANOL]	15	101,2	Short Term Exposure Limit (STEL):	Indicative OELV	IR_OEL
2-(2-Butoxyethoxy)ethanol 112-34-5 [2-(2-BUTOXYETHOXY)ETHANOL]	10	67,5	Time Weighted Average (TWA):	Indicative OELV	IR_OEL
2-(2-Butoxyethoxy)ethanol 112-34-5 [2-(2-BUTOXYETHOXY)ETHANOL]	10	67,5	Time Weighted Average (TWA):	Indicative	ECTLV
2-(2-Butoxyethoxy)ethanol 112-34-5 [2-(2-BUTOXYETHOXY)ETHANOL]	15	101,2	Short Term Exposure Limit (STEL):	Indicative	ECTLV
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL (EGBE)]	50	246	Short Term Exposure Limit (STEL):	Indicative OELV	IR_OEL
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL (EGBE)]	20	98	Time Weighted Average (TWA):	Indicative OELV	IR_OEL
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL (EGBE)]			Skin designation:	Can be absorbed through the skin.	IR_OEL
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL]	20	98	Time Weighted Average (TWA):	Indicative	ECTLV
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL]	50	246	Short Term Exposure Limit (STEL):	Indicative	ECTLV
Nickel 7440-02-0 [NICKEL]		0,5	Time Weighted Average (TWA):		IR_OEL
Manganese ferrite black spinel 68186-94-7 [MANGANESE AND COMPOUNDS (AS MN)]		0,2	Time Weighted Average (TWA):		IR_OEL
Manganese ferrite black spinel 68186-94-7 [MANGANESE AND INORGANIC MANGANESE COMPOUNDS (AS MN) (INHALABLE FRACTION)]		0,2	Time Weighted Average (TWA):	Indicative	ECTLV
Manganese ferrite black spinel 68186-94-7 [MANGANESE AND INORGANIC MANGANESE COMPOUNDS (AS MN) (RESPIRABLE FRACTION)]		0,05	Time Weighted Average (TWA):	Indicative	ECTLV
n-Butyl acetate 123-86-4 [BUTYL ACETATE]	150	710	Time Weighted Average (TWA):		IR_OEL
n-Butyl acetate 123-86-4 [BUTYL ACETATE]	200	950	Short Term Exposure Limit (STEL):		IR_OEL

Predicted No-Effect Concentration (PNEC):

Name on list	Environmental Compartment	Exposure period	Value				Remarks
			mg/l	ppm	mg/kg	others	
2-(2-Butoxyethoxy)ethanol 112-34-5	aqua (freshwater)		1 mg/l				
2-(2-Butoxyethoxy)ethanol 112-34-5	aqua (marine water)		0,1 mg/l				
2-(2-Butoxyethoxy)ethanol 112-34-5	aqua (intermittent releases)		3,9 mg/l				
2-(2-Butoxyethoxy)ethanol 112-34-5	sediment (freshwater)				4 mg/kg		
2-(2-Butoxyethoxy)ethanol 112-34-5	sediment (marine water)				0,4 mg/kg		
2-(2-Butoxyethoxy)ethanol 112-34-5	sewage treatment plant (STP)		200 mg/l				
2-(2-Butoxyethoxy)ethanol 112-34-5	oral				56 mg/kg		
2-(2-Butoxyethoxy)ethanol 112-34-5	soil				0,4 mg/kg		
2-Butoxyethanol 111-76-2	aqua (freshwater)		8,8 mg/l				
2-Butoxyethanol 111-76-2	aqua (marine water)		0,88 mg/l				
2-Butoxyethanol 111-76-2	sewage treatment plant (STP)		463 mg/l				
2-Butoxyethanol 111-76-2	sediment (freshwater)				34,6 mg/kg		
2-Butoxyethanol 111-76-2	sediment (marine water)				3,46 mg/kg		
2-Butoxyethanol 111-76-2	aqua (intermittent releases)		9,1 mg/l				
2-Butoxyethanol 111-76-2	soil				2,33 mg/kg		
2-Butoxyethanol 111-76-2	oral				20 mg/kg		
Nickel 7440-02-0	soil				29,9 mg/kg		
Nickel 7440-02-0	aqua (freshwater)		7,1 µg/l				
Nickel 7440-02-0	aqua (marine water)		8,6 µg/l				
n-Butyl acetate 123-86-4	aqua (freshwater)		0,18 mg/l				
n-Butyl acetate 123-86-4	aqua (marine water)		0,018 mg/l				
n-Butyl acetate 123-86-4	aqua (intermittent releases)		0,36 mg/l				
n-Butyl acetate 123-86-4	sewage treatment plant (STP)		35,6 mg/l				
n-Butyl acetate 123-86-4	sediment (freshwater)				0,981 mg/kg		
n-Butyl acetate 123-86-4	sediment (marine water)				0,0981 mg/kg		
n-Butyl acetate 123-86-4	soil				0,0903 mg/kg		
n-Butyl acetate 123-86-4	Air						
n-Butyl acetate 123-86-4	Predator						

Derived No-Effect Level (DNEL):

Name on list	Application Area	Route of Exposure	Health Effect	Exposure Time	Value	Remarks
Silver Nano Powder 7440-22-4	Workers	inhalation	Long term exposure - systemic effects		0,1 mg/m3	
Silver Nano Powder 7440-22-4	General population	inhalation	Long term exposure - systemic effects		0,04 mg/m3	
Silver Nano Powder 7440-22-4	General population	oral	Long term exposure - systemic effects		1,2 mg/kg	
2-(2-Butoxyethoxy)ethanol 112-34-5	Workers	inhalation	Long term exposure - systemic effects		67,5 mg/m3	
2-(2-Butoxyethoxy)ethanol 112-34-5	Workers	dermal	Long term exposure - systemic effects		20 mg/kg	
2-(2-Butoxyethoxy)ethanol 112-34-5	General population	inhalation	Acute/short term exposure - local effects		60,7 mg/m3	
2-(2-Butoxyethoxy)ethanol 112-34-5	General population	inhalation	Long term exposure - systemic effects		40,5 mg/m3	
2-(2-Butoxyethoxy)ethanol 112-34-5	General population	dermal	Long term exposure - systemic effects		50 mg/kg	
2-(2-Butoxyethoxy)ethanol 112-34-5	Workers	inhalation	Acute/short term exposure - local effects		101,2 mg/m3	
2-(2-Butoxyethoxy)ethanol 112-34-5	Workers	inhalation	Long term exposure - local effects		67,5 mg/m3	
2-(2-Butoxyethoxy)ethanol 112-34-5	General population	oral	Long term exposure - systemic effects		5 mg/kg	
2-(2-Butoxyethoxy)ethanol 112-34-5	General population	inhalation	Long term exposure - local effects		40,5 mg/m3	
Iron 7439-89-6	General population	oral	Long term exposure - systemic effects		0,71 mg/kg	
Iron 7439-89-6	General population	inhalation	Long term exposure - local effects		1,5 mg/m3	
Iron 7439-89-6	Workers	inhalation	Long term exposure - local effects		3 mg/m3	
2-Butoxyethanol 111-76-2	Workers	inhalation	Acute/short term exposure - systemic effects		1091 mg/m3	
2-Butoxyethanol 111-76-2	Workers	dermal	Long term exposure - systemic effects		125 mg/kg	
2-Butoxyethanol 111-76-2	Workers	inhalation	Long term exposure - systemic effects		98 mg/m3	
2-Butoxyethanol 111-76-2	General population	inhalation	Acute/short term exposure - systemic effects		426 mg/m3	
2-Butoxyethanol 111-76-2	General population	inhalation	Acute/short term exposure - local effects		147 mg/m3	
2-Butoxyethanol 111-76-2	General population	dermal	Long term exposure - systemic effects		75 mg/kg	
2-Butoxyethanol 111-76-2	General population	inhalation	Long term exposure - systemic effects		59 mg/m3	
2-Butoxyethanol 111-76-2	General population	oral	Long term exposure - systemic effects		6,3 mg/kg	
2-Butoxyethanol 111-76-2	Workers	inhalation	Acute/short term exposure - local		246 mg/m3	

			effects			
2-Butoxyethanol 111-76-2	Workers	dermal	Acute/short term exposure - systemic effects		89 mg/kg	
2-Butoxyethanol 111-76-2	General population	dermal	Acute/short term exposure - systemic effects		89 mg/kg	
2-Butoxyethanol 111-76-2	General population	oral	Acute/short term exposure - systemic effects		26,7 mg/kg	
n-Butyl acetate 123-86-4	Workers	inhalation	Long term exposure - systemic effects		300 mg/m3	
n-Butyl acetate 123-86-4	Workers	inhalation	Acute/short term exposure - systemic effects		600 mg/m3	
n-Butyl acetate 123-86-4	Workers	inhalation	Long term exposure - local effects		300 mg/m3	
n-Butyl acetate 123-86-4	Workers	inhalation	Acute/short term exposure - local effects		600 mg/m3	
n-Butyl acetate 123-86-4	Workers	dermal	Long term exposure - systemic effects		11 mg/kg	
n-Butyl acetate 123-86-4	Workers	dermal	Acute/short term exposure - systemic effects		11 mg/kg	
n-Butyl acetate 123-86-4	General population	inhalation	Long term exposure - systemic effects		35,7 mg/m3	
n-Butyl acetate 123-86-4	General population	inhalation	Acute/short term exposure - systemic effects		300 mg/m3	
n-Butyl acetate 123-86-4	General population	inhalation	Acute/short term exposure - local effects		300 mg/m3	
n-Butyl acetate 123-86-4	General population	dermal	Long term exposure - systemic effects		6 mg/kg	
n-Butyl acetate 123-86-4	General population	dermal	Acute/short term exposure - systemic effects		6 mg/kg	
n-Butyl acetate 123-86-4	General population	oral	Long term exposure - systemic effects		2 mg/kg	
n-Butyl acetate 123-86-4	General population	oral	Acute/short term exposure - systemic effects		2 mg/kg	
n-Butyl acetate 123-86-4	General population	inhalation	Long term exposure - local effects		35,7 mg/m3	

Biological Exposure Indices:

Ingredient [Regulated substance]	Parameters	Biological specimen	Sampling time	Conc.	Basis of biol. exposure index	Remark	Additional Information
2-Butoxyethanol 111-76-2 [2-BUTOXYETHANOL]	Butoxyacetic acid	Creatinine in urine	Sampling time: End of shift.		UKEH40BMGV		

8.2. Exposure controls:

Engineering controls:
Ensure good ventilation/extraction.

Respiratory protection:
Ensure adequate ventilation.
An approved mask or respirator fitted with an organic vapour cartridge should be worn if the product is used in a poorly ventilated area
Filter type: A (EN 14387)

Hand protection:
Chemical-resistant protective gloves (EN 374).
Suitable materials for short-term contact or splashes (recommended: at least protection index 2, corresponding to > 30 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced.

Eye protection:
Safety glasses with sideshields or chemical safety goggles should be worn if there is a risk of splashing.
Protective eye equipment should conform to EN166.

Skin protection:
Wear suitable protective clothing.
Protective clothing should conform to EN 14605 for liquid splashes or to EN 13982 for dusts.

Advices to personal protection equipment:

The information provided on personal protective equipment is for guidance purposes only. A full risk assessment should be conducted prior to using this product to determine the appropriate personal protective equipment to suit local conditions. Personal protective equipment should conform to the relevant EN standard.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	paste liquid silver
Odor	None
Odour threshold	No data available / Not applicable
pH	No data available / Not applicable
Melting point	No data available / Not applicable
Solidification temperature	No data available / Not applicable
Initial boiling point	No data available / Not applicable
Flash point	50 °C (122 °F); calculated
Evaporation rate	No data available / Not applicable
Flammability	No data available / Not applicable
Explosive limits	No data available / Not applicable
Vapour pressure	No data available / Not applicable
Relative vapour density:	No data available / Not applicable
Density ()	4,04 g/cm3
Bulk density	No data available / Not applicable
Solubility	No data available / Not applicable
Solubility (qualitative) (Solvent: Water)	Soluble
Partition coefficient: n-octanol/water	No data available / Not applicable
Auto-ignition temperature	No data available / Not applicable
Decomposition temperature	No data available / Not applicable
Viscosity	No data available / Not applicable
Viscosity (kinematic)	No data available / Not applicable
Explosive properties	No data available / Not applicable
Oxidising properties	No data available / Not applicable

9.2. Other information

No data available / Not applicable

SECTION 10: Stability and reactivity

10.1. Reactivity
Reducing agents.
Strong oxidizing agents.

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
See section reactivity

10.4. Conditions to avoid
Heat, flames, sparks and other sources of ignition.

10.5. Incompatible materials
See section reactivity.

10.6. Hazardous decomposition products
Hydrocarbons
carbon oxides.

SECTION 11: Toxicological information

General toxicological information:
Prolonged or repeated contact may cause skin irritation.

11.1. Information on toxicological effects

Acute oral toxicity:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Species	Method
Silver Nano Powder 7440-22-4	LD50	> 2.000 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)
2-(2-Butoxyethoxy)ethanol 112-34-5	LD50	> 2.000 mg/kg	rat	EU Method B.1 (Acute Toxicity (Oral))
Iron 7439-89-6	LD50	98.600 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)
2-Butoxyethanol 111-76-2	LD50	1.746 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)
Nickel powder [particle diameter < 1 mm] 7440-02-0	LD50	> 9.000 mg/kg	rat	not specified
n-Butyl acetate 123-86-4	LD50	10.760 mg/kg	rat	OECD Guideline 423 (Acute Oral toxicity)

Acute dermal toxicity:

Prolonged or repeated skin contact with silver and its salts may cause a blue-gray discoloration of the skin and mucous membranes that is irreversible (Argyria).

Hazardous substances CAS-No.	Value type	Value	Species	Method
Silver Nano Powder 7440-22-4	LD50	> 2.000 mg/kg	rat	OECD Guideline 402 (Acute Dermal Toxicity)
2-(2-Butoxyethoxy)ethanol 112-34-5	LD50	2.764 mg/kg	rabbit	OECD Guideline 402 (Acute Dermal Toxicity)
n-Butyl acetate 123-86-4	LD50	> 14.112 mg/kg	rabbit	OECD Guideline 402 (Acute Dermal Toxicity)

Acute inhalative toxicity:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Test atmosphere	Exposure time	Species	Method
Silver Nano Powder 7440-22-4	LC50	> 5,16 mg/l		4 h	rat	OECD Guideline 436 (Acute Inhalation Toxicity: Acute Toxic Class (ATC) Method)
n-Butyl acetate 123-86-4	LC50	> 23,4 mg/l	mist	4 h	rat	OECD Guideline 403 (Acute Inhalation Toxicity)

Skin corrosion/irritation:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result	Exposure time	Species	Method
Silver Nano Powder 7440-22-4	not irritating		rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
2-(2-Butoxyethoxy)ethanol 112-34-5	not irritating		rabbit	Draize Test
Iron 7439-89-6	not irritating	4 h	rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
2-Butoxyethanol 111-76-2	irritating	4 h	rabbit	EU Method B.4 (Acute Toxicity: Dermal Irritation / Corrosion)
n-Butyl acetate 123-86-4	not irritating		rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

Serious eye damage/irritation:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result	Exposure time	Species	Method
Silver Nano Powder 7440-22-4	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
2-(2-Butoxyethoxy)ethanol 112-34-5	moderately irritating		rabbit	not specified
Iron 7439-89-6	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
2-Butoxyethanol 111-76-2	irritating	24 h	rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
n-Butyl acetate 123-86-4	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)

Respiratory or skin sensitization:

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result	Test type	Species	Method
Silver Nano Powder 7440-22-4	not sensitising		guinea pig	OECD Guideline 406 (Skin Sensitisation)
2-(2-Butoxyethoxy)ethanol 112-34-5	not sensitising	Guinea pig maximisation test	guinea pig	Magnusson and Kligman Method
Iron 7439-89-6	not sensitising	Maurer optimisation test	guinea pig	not specified
2-Butoxyethanol 111-76-2	not sensitising	Guinea pig maximisation test	guinea pig	OECD Guideline 406 (Skin Sensitisation)
n-Butyl acetate 123-86-4	not sensitising	Guinea pig maximisation test	guinea pig	not specified

Germ cell mutagenicity:

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result	Type of study / Route of administration	Metabolic activation / Exposure time	Species	Method
Silver Nano Powder 7440-22-4	negative	in vitro mammalian chromosome aberration test	with and without		OECD Guideline 487 (In vitro Mammalian Cell Micronucleus Test)
2-(2-Butoxyethoxy)ethanol 112-34-5	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Iron 7439-89-6	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Iron 7439-89-6	negative	mammalian cell gene mutation assay	with and without		OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
2-Butoxyethanol 111-76-2	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2-Butoxyethanol 111-76-2	negative	in vitro mammalian chromosome aberration test	with and without		OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
2-Butoxyethanol 111-76-2	negative	mammalian cell gene mutation assay	with and without		OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
n-Butyl acetate 123-86-4	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
n-Butyl acetate 123-86-4	negative	mammalian cell gene mutation assay	with and without		OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
2-Butoxyethanol 111-76-2	negative	intraperitoneal		mouse	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
n-Butyl acetate 123-86-4	negative	oral: gavage		mouse	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)

Carcinogenicity

No data available.

Reproductive toxicity:

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result / Value	Test type	Route of application	Species	Method
2-Butoxyethanol 111-76-2	NOAEL P 720 mg/kg NOAEL F1 720 mg/kg NOAEL F2 720 mg/kg	Two generation study	oral: drinking water	mouse	not specified

STOT-single exposure:

No data available.

STOT-repeated exposure::

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result / Value	Route of application	Exposure time / Frequency of treatment	Species	Method
Silver Nano Powder 7440-22-4	NOAEL 30 mg/kg	oral: gavage	13 weeks daily	rat	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
2-(2-Butoxyethoxy)ethanol 112-34-5	NOAEL < 50 mg/kg	oral: gavage	90 days 5 days/week	rat	not specified
2-(2-Butoxyethoxy)ethanol 112-34-5	NOAEL 2 - 6 ppm	inhalation	90 days	rat	not specified
2-(2-Butoxyethoxy)ethanol 112-34-5	NOAEL > 2.000 mg/kg	dermal	13 weeks 6 hours/day, 5 days/week	rat	not specified
2-Butoxyethanol 111-76-2	NOAEL 0,121 mg/l	inhalation	42 or 90 days 6 hours/day, 5 days/week	rat	not specified
2-Butoxyethanol 111-76-2	NOAEL < 69 mg/kg	oral: drinking water	91 d continous	rat	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
n-Butyl acetate 123-86-4	NOAEL 125 mg/kg	oral: gavage	6 (interim sacrifice) or 13 w daily	rat	EPA OTS 798.2650 (90-Day Oral Toxicity in Rodents)

Aspiration hazard:

No data available.

SECTION 12: Ecological information

General ecological information:
Do not empty into drains / surface water / ground water.

12.1. Toxicity

Toxicity (Fish):

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
Silver Nano Powder 7440-22-4	LC50	0,0012 mg/l	96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)
Silver Nano Powder 7440-22-4	NOEC	0,000351 mg/l	28 d	Pimephales promelas	other guideline:
2-(2-Butoxyethoxy)ethanol 112-34-5	LC50	1.300 mg/l	96 h	Lepomis macrochirus	OECD Guideline 203 (Fish, Acute Toxicity Test)
Iron 7439-89-6	LC50			Cyprinus carpio	OECD Guideline 203 (Fish, Acute Toxicity Test)
2-Butoxyethanol 111-76-2	LC50	1.474 mg/l	96 h	Oncorhynchus mykiss	OECD Guideline 203 (Fish, Acute Toxicity Test)
2-Butoxyethanol 111-76-2	NOEC	> 100 mg/l	21 d	Brachydanio rerio (new name: Danio rerio)	OECD Guideline 204 (Fish, Prolonged Toxicity Test: 14-day Study)
Nickel powder [particle diameter < 1 mm] 7440-02-0	LC50	> 100 mg/l	96 h	Brachydanio rerio (new name: Danio rerio)	OECD Guideline 203 (Fish, Acute Toxicity Test)
n-Butyl acetate 123-86-4	LC50	18 mg/l	96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)

Toxicity (Daphnia):

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
Silver Nano Powder 7440-22-4	EC50	0,00022 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
2-(2-Butoxyethoxy)ethanol 112-34-5	EC50	3.300 mg/l	24 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Iron 7439-89-6	EC50				not specified
2-Butoxyethanol 111-76-2	EC50	1.550 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Nickel powder [particle diameter < 1 mm] 7440-02-0	EC50	> 100 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
n-Butyl acetate 123-86-4	EC50	44 mg/l	48 h	Daphnia sp.	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)

Chronic toxicity to aquatic invertebrates

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
Silver Nano Powder 7440-22-4	NOEC	0,00032 mg/l	21 day	Daphnia magna	EPA OPPTS 850.1300 (Daphnid Chronic Toxicity Test)
2-Butoxyethanol 111-76-2	NOEC	100 mg/l	21 d	Daphnia magna	OECD 211 (Daphnia magna, Reproduction Test)
n-Butyl acetate 123-86-4	NOEC	23,2 mg/l	21 d	Daphnia magna	OECD 211 (Daphnia magna, Reproduction Test)

Toxicity (Algae):

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
2-(2-Butoxyethoxy)ethanol 112-34-5	NOEC	> 100 mg/l	96 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-(2-Butoxyethoxy)ethanol 112-34-5	EC50	> 100 mg/l	96 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-Butoxyethanol 111-76-2	EC50	1.840 mg/l	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-Butoxyethanol 111-76-2	NOEC	286 mg/l	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
n-Butyl acetate 123-86-4	EC50	674,7 mg/l	72 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	OECD Guideline 201 (Alga, Growth Inhibition Test)
n-Butyl acetate 123-86-4	EC10	295,5 mg/l	72 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	OECD Guideline 201 (Alga, Growth Inhibition Test)

Toxicity to microorganisms

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
2-(2-Butoxyethoxy)ethanol 112-34-5	EC10	> 1.995 mg/l	30 min	activated sludge, industrial	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
2-Butoxyethanol 111-76-2	EC0	1.000 mg/l	30 min		not specified
n-Butyl acetate 123-86-4	IC50	356 mg/l	40 h	Ciliate (Tetrahymena pyriformis)	other guideline:

12.2. Persistence and degradability

The product is not biodegradable.

Hazardous substances CAS-No.	Result	Test type	Degradability	Exposure time	Method
2-(2-Butoxyethoxy)ethanol 112-34-5	inherently biodegradable	aerobic	100 %	9 d	OECD Guideline 302 B (Inherent biodegradability: Zahn-Wellens/EMPA Test)
2-(2-Butoxyethoxy)ethanol 112-34-5	readily biodegradable	aerobic	> 60 %	28 d	OECD Guideline 301 C (Ready Biodegradability: Modified MITI Test (I))
2-Butoxyethanol 111-76-2	readily biodegradable	aerobic	73 %	30 d	EU Method C.4-E (Determination of the "Ready" BiodegradabilityClosed Bottle Test)
n-Butyl acetate 123-86-4	readily biodegradable	aerobic	83 %	28 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)

12.3. Bioaccumulative potential

No data available.

No substance data available.

12.4. Mobility in soil

Cured adhesives are immobile.

Hazardous substances CAS-No.	LogPow	Temperature	Method
2-(2-Butoxyethoxy)ethanol 112-34-5	1	20 °C	OECD Guideline 117 (Partition Coefficient (n-octanol / water), HPLC Method)
2-Butoxyethanol 111-76-2	0,81	25 °C	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
n-Butyl acetate 123-86-4	2,3	25 °C	OECD Guideline 117 (Partition Coefficient (n-octanol / water), HPLC Method)

12.5. Results of PBT and vPvB assessment

Hazardous substances CAS-No.	PBT / vPvB
2-(2-Butoxyethoxy)ethanol 112-34-5	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
Iron 7439-89-6	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
2-Butoxyethanol 111-76-2	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
Nickel powder [particle diameter < 1 mm] 7440-02-0	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
n-Butyl acetate 123-86-4	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.

12.6. Other adverse effects

No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product disposal:
Do not empty into drains / surface water / ground water.
Dispose of in accordance with local and national regulations.

Disposal of uncleaned packages:
After use, tubes, cartons and bottles containing residual product should be disposed of as chemically contaminated waste in an authorised legal land fill site or incinerated.

Waste code

08 04 09 waste adhesives and sealants containing organic solvents and other dangerous substances
The valid EWC waste code numbers are source-related. The manufacturer is therefore unable to specify EWC waste codes for the articles or products used in the various sectors. The EWC codes listed are intended as a recommendation for users. We will be happy to advise you.

SECTION 14: Transport information

14.1. UN number

ADR	1139
RID	1139
ADN	1139
IMDG	1139
IATA	1139

14.2. UN proper shipping name

ADR	COATING SOLUTION
RID	COATING SOLUTION
ADN	COATING SOLUTION
IMDG	COATING SOLUTION (Silver)
IATA	Coating solution

14.3. Transport hazard class(es)

ADR	3
RID	3
ADN	3
IMDG	3
IATA	3

14.4. Packing group

ADR	III
RID	III
ADN	III
IMDG	III
IATA	III

14.5. Environmental hazards

ADR	Environmentally Hazardous
RID	Environmentally Hazardous
ADN	Environmentally Hazardous
IMDG	Marine pollutant
IATA	not applicable

14.6. Special precautions for user

ADR	Special provision 640E Tunnelcode: (D/E)
RID	Special provision 640E
ADN	Special provision 640E
IMDG	not applicable
IATA	not applicable

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

not applicable

SECTION 15: Regulatory information

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

VOC content (2010/75/EC) 5 - 10 %

15.2. Chemical safety assessment

A chemical safety assessment has not been carried out.

SECTION 16: Other information

The labelling of the product is indicated in Section 2. The full text
of all abbreviations indicated by codes in this safety data sheet are as follows:

H226 Flammable liquid and vapor.
H228 Flammable solid.
H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H336 May cause drowsiness or dizziness.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.
H412 Harmful to aquatic life with long lasting effects.

Further information:
This information is based on our current level of knowledge and relates to the product in the state in which it is delivered. It is intended to describe our products from the point of view of safety requirements and is not intended to guarantee any particular properties.

Relevant changes in this safety data sheet are indicated by vertical lines at the left margin in the body of this document. Corresponding text is displayed in a different color on shadowed fields.