



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

Page 1 of 23

LOCTITE GC 50 SAC305T5 84V 12K

SDS No. : 597997
V003.0

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

1.1. Product identifier

LOCTITE GC 50 SAC305T5 84V 12K

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

Intended use:

Solder Paste

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):

Serious eye damage

Category 1

H318 Causes serious eye damage.

Skin sensitizer

Category 1

H317 May cause an allergic skin reaction.

Chronic hazards to the aquatic environment

Category 2

H411 Toxic to aquatic life with long lasting effects.

2.2. Label elements

Label elements (CLP):

Hazard pictogram:



Contains

2-(2-hexyloxyethoxy)ethanol

rosin

Dodecane-1-thiol

Signal word:	Danger
Hazard statement:	H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H411 Toxic to aquatic life with long lasting effects.
Precautionary statement: Prevention	P261 Avoid breathing fume. P273 Avoid release to the environment. P280 Wear protective gloves/eye protection.
Precautionary statement: Response	P333+P313 If skin irritation or rash occurs: Get medical advice/attention. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3. Other hazards

Avoid breathing fumes given out during soldering.

After handling solder wash hands with soap and water before eating, drinking or smoking.

Keep out of reach of children.

This product contains modified rosin.

Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.

Flux fumes may irritate the nose, throat and lungs and may after prolonged/repeated exposure give an allergic reaction (asthma).

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
Tin 7440-31-5	231-141-8 01-2119486474-28	50- 100 %	
2-(2-hexyloxyethoxy)ethanol 112-59-4	203-988-3 01-2119945815-28	1- < 5 %	Acute Tox. 4; Dermal H312 Eye Dam. 1 H318
Modified rosin 144413-22-9	434-230-1, 434- 230-1 01-2120117087-62	2,5- < 25 %	Aquatic Chronic 4 H413
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	231-131-3 01-2119555669-21	2,5- < 25 %	Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M factor (Acute Aquat Tox): 10 M factor (Chron Aquat Tox): 10
rosin 8050-09-7	232-475-7 01-2119480418-32	1- < 5 %	Skin Sens. 1 H317
Copper 7440-50-8	231-159-6 01-2119480154-42	0,25- < 2,5 %	Aquatic Acute 1 H400 Aquatic Chronic 3 H412
Dodecane-1-thiol 112-55-0	203-984-1 01-2119491318-31	0,1- < 1 %	Skin Corr. 1C H314 Aquatic Chronic 1 H410 Skin Sens. 1A H317 Eye Dam. 1 H318 Aquatic Acute 1 H400 M factor (Acute Aquat Tox): 10 M factor (Chron Aquat Tox): 10
2-hexyloxyethanol 112-25-4	203-951-1 01-2119486575-24	0,1- < 1 %	Acute Tox. 4; Oral H302 Acute Tox. 3; Dermal H311 Skin Corr. 1B H314

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:**

Move to fresh air. If symptoms persist, seek medical advice.

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:

Do not induce vomiting.
Seek medical advice.

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

SKIN: Rash, Urticaria.

After eye contact: Corrosive, may cause permanent damage to eyes (impairment of vision).

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).

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

See section: Description of first aid measures

SECTION 5: Firefighting measures**5.1. Extinguishing media****Suitable extinguishing media:**

Carbon dioxide, foam, powder

Fine water spray

Extinguishing media which must not be used for safety reasons:

Do not use water on fires where molten metal is present.

5.2. Special hazards arising from the substance or mixture

High temperatures may produce heavy metal dust, fumes or vapours.

The flux medium will give rise to irritating fumes.

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.

Ensure adequate ventilation.

Wear protective equipment.

6.2. Environmental precautions

Do not empty into drains / surface water / ground water.

6.3. Methods and material for containment and cleaning up

Scrape up spilled material and place in a closed container for disposal.

Dispose of contaminated material as waste according to Section 13.

6.4. Reference to other sections

See advice in section 8

SECTION 7: Handling and storage**7.1. Precautions for safe handling**

Use only in well-ventilated areas.

Avoid skin and eye contact.

Extraction is necessary to remove fumes evolved during reflow.

When using do not eat, drink or smoke.

Wash hands before breaks and immediately after handling the product.

Avoid breathing fumes given out during soldering.

See advice in section 8

Hygiene measures:

Good industrial hygiene practices should be observed.

Do not eat, drink or smoke while working.

After handling solder wash hands with soap and water before eating, drinking or smoking.

7.2. Conditions for safe storage, including any incompatibilities

Ensure good ventilation/extraction.
Store only in the original container.
Refer to Technical Data Sheet

7.3. Specific end use(s)

Solder Paste

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits

Valid for
Great Britain

Ingredient [Regulated substance]	ppm	mg/m ³	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
Rosin 8050-09-7 [ROSIN-BASED SOLDER FLUX FUME]		0,05	Time Weighted Average (TWA):		EH40 WEL
Rosin 8050-09-7 [ROSIN-BASED SOLDER FLUX FUME]		0,15	Short Term Exposure Limit (STEL):		EH40 WEL
Copper 7440-50-8 [COPPER, FUME]		0,2	Time Weighted Average (TWA):		EH40 WEL
Copper 7440-50-8 [COPPER, INHALABLE DUSTS AND MISTS (AS CU)]		1	Time Weighted Average (TWA):		EH40 WEL
Copper 7440-50-8 [COPPER, INHALABLE DUSTS AND MISTS (AS CU)]		2	Short Term Exposure Limit (STEL):		EH40 WEL

Occupational Exposure Limits

Valid for
Ireland

Ingredient [Regulated substance]	ppm	mg/m ³	Value type	Short term exposure limit category / Remarks	Regulatory list
Tin 7440-31-5 [TIN, METAL (AS SN)]		2	Time Weighted Average (TWA):	Indicative OELV	IR_OEL
Tin 7440-31-5 [TIN (INORGANIC COMPOUNDS AS SN)]		2	Time Weighted Average (TWA):	Indicative	ECTLV
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
Rosin 8050-09-7 [ROSIN CORE SOLDER PYROLYSIS PRODUCTS (AS AIRBORNE TOTAL RESIN ACID)]		0,05	Time Weighted Average (TWA):		IR_OEL
Rosin 8050-09-7 [ROSIN CORE SOLDER PYROLYSIS PRODUCTS (AS AIRBORNE TOTAL RESIN ACID)]		0,15	Short Term Exposure Limit (STEL):	15 minutes	IR_OEL
Copper 7440-50-8 [COPPER (AS CU), DUSTS AND MISTS]		1	Time Weighted Average (TWA):		IR_OEL
Copper 7440-50-8 [COPPER (AS CU), FUME]		0,2	Time Weighted Average (TWA):		IR_OEL
Dodecane-1-thiol	0,1		Time Weighted Average		IR_OEL

112-55-0 [DODECYL MERCAPTAN]			(TWA):		
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Predicted No-Effect Concentration (PNEC):

Name on list	Environmental Compartment	Exposure period	Value				Remarks
			mg/l	ppm	mg/kg	others	
Tin 7440-31-5	aqua (freshwater)						no hazard identified
Tin 7440-31-5	aqua (marine water)						no hazard identified
Tin 7440-31-5	sewage treatment plant (STP)						no hazard identified
Tin 7440-31-5	sediment (freshwater)						no hazard identified
Tin 7440-31-5	sediment (marine water)						no hazard identified
Tin 7440-31-5	Air						no hazard identified
Tin 7440-31-5	Soil						no hazard identified
Tin 7440-31-5	Predator						no potential for bioaccumulation
2-(2-Hexyloxyethoxy)ethanol 112-59-4	aqua (freshwater)		1,963 mg/l				
2-(2-Hexyloxyethoxy)ethanol 112-59-4	aqua (marine water)		0,196 mg/l				
2-(2-Hexyloxyethoxy)ethanol 112-59-4	aqua (intermittent releases)		1 mg/l				
2-(2-Hexyloxyethoxy)ethanol 112-59-4	Sewage treatment plant		10 mg/l				
2-(2-Hexyloxyethoxy)ethanol 112-59-4	sediment (freshwater)				10,7 mg/kg		
2-(2-Hexyloxyethoxy)ethanol 112-59-4	sediment (marine water)				1,07 mg/kg		
2-(2-Hexyloxyethoxy)ethanol 112-59-4	Soil				0,995 mg/kg		
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	aqua (freshwater)		0,00004 mg/l				
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	aqua (marine water)		0,00086 mg/l				
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	sewage treatment plant (STP)		0,025 mg/l				
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	sediment (freshwater)				438,13 mg/kg		
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	sediment (marine water)				438,13 mg/kg		
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	Air						no hazard identified
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	Soil				1,41 mg/kg		
rosin 8050-09-7	aqua (freshwater)		0,002 mg/l				
rosin 8050-09-7	aqua (marine water)		0,0002 mg/l				
rosin 8050-09-7	sediment (freshwater)				0,007 mg/kg		
rosin 8050-09-7	sediment (marine water)				0,001 mg/kg		
rosin 8050-09-7	Soil				0 mg/kg		
rosin 8050-09-7	sewage treatment plant (STP)		1000 mg/l				
rosin 8050-09-7	aqua (intermittent releases)		0,016 mg/l				

Copper 7440-50-8	Soil				65 mg/kg		
Copper 7440-50-8	sewage treatment plant (STP)		230 µg/l				
Copper 7440-50-8	sediment (marine water)				676 mg/kg		
Copper 7440-50-8	aqua (freshwater)		7,8 µg/l				
Copper 7440-50-8	aqua (marine water)		5,2 µg/l				
Copper 7440-50-8	sediment (freshwater)				87 mg/kg		
2-Hexyloxyethanol 112-25-4	aqua (freshwater)		0,14 mg/l				
2-Hexyloxyethanol 112-25-4	aqua (marine water)		0,014 mg/l				
2-Hexyloxyethanol 112-25-4	aqua (intermittent releases)		1,4 mg/l				
2-Hexyloxyethanol 112-25-4	sediment (freshwater)				0,644 mg/kg		
2-Hexyloxyethanol 112-25-4	sediment (marine water)				0,0644 mg/kg		
2-Hexyloxyethanol 112-25-4	Soil				0,0467 mg/kg		
2-Hexyloxyethanol 112-25-4	sewage treatment plant (STP)		75 mg/l				

Derived No-Effect Level (DNEL):

Name on list	Application Area	Route of Exposure	Health Effect	Exposure Time	Value	Remarks
Tin 7440-31-5	General population	dermal	Long term exposure - systemic effects		80 mg/kg	no hazard identified
Tin 7440-31-5	Workers	inhalation	Long term exposure - systemic effects		71 mg/m ³	no hazard identified
Tin 7440-31-5	Workers	dermal	Long term exposure - systemic effects		10 mg/kg	no hazard identified
Tin 7440-31-5	General population	inhalation	Long term exposure - systemic effects		17 mg/m ³	no hazard identified
Tin 7440-31-5	General population	oral	Long term exposure - systemic effects		5 mg/kg	no hazard identified
2-(2-Hexyloxyethoxy)ethanol 112-59-4	worker	inhalation	Long term exposure - systemic effects		16,3 mg/m ³	
2-(2-Hexyloxyethoxy)ethanol 112-59-4	Workers	dermal	Long term exposure - systemic effects		50 mg/kg	
2-(2-Hexyloxyethoxy)ethanol 112-59-4	General population	inhalation	Long term exposure - systemic effects		4,1 mg/m ³	
2-(2-Hexyloxyethoxy)ethanol 112-59-4	General population	dermal	Long term exposure - systemic effects		25 mg/kg	
2-(2-Hexyloxyethoxy)ethanol 112-59-4	General population	oral	Long term exposure - systemic effects		1,25 mg/kg	
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	Workers	inhalation	Long term exposure - systemic effects		0,1 mg/m ³	no hazard identified
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	General population	inhalation	Long term exposure - systemic effects		0,04 mg/m ³	no hazard identified
Silver >= 99,9 % Ag as powder (>100nm<1mm) classified for environment 7440-22-4	General population	oral	Long term exposure - systemic effects		1,2 mg/kg	no hazard identified
rosin 8050-09-7	Workers	inhalation	Long term exposure - local effects		10 mg/m ³	
rosin 8050-09-7	Workers	dermal	Long term exposure - systemic effects		2131 mg/kg	
rosin 8050-09-7	General population	dermal	Long term exposure - systemic effects		1065 mg/kg	
rosin 8050-09-7	General population	oral	Long term exposure - systemic effects		1065 mg/kg	
Copper 7440-50-8	Workers	dermal	Acute/short term exposure - systemic effects		273 mg/kg	
Copper 7440-50-8	General population	inhalation	Acute/short term exposure - local effects		1 mg/m ³	
Copper 7440-50-8	General population	inhalation	Long term exposure - local effects		1 mg/m ³	
Copper 7440-50-8	General population	dermal	Acute/short term exposure - systemic effects		273 mg/kg	
Copper 7440-50-8	Workers	dermal	Long term exposure - systemic effects		137 mg/kg	
Copper 7440-50-8	General population	dermal	Long term exposure - systemic effects		137 mg/kg	
Copper 7440-50-8	General population	oral	Long term exposure -		0,041 mg/kg	

			systemic effects			
2-Hexyloxyethanol 112-25-4	Workers	dermal	Long term exposure - systemic effects		9,3 mg/kg	
2-Hexyloxyethanol 112-25-4	Workers	inhalation	Long term exposure - systemic effects		18,4 mg/m ³	
2-Hexyloxyethanol 112-25-4	General population	dermal	Long term exposure - systemic effects		4,63 mg/kg	
2-Hexyloxyethanol 112-25-4	General population	inhalation	Long term exposure - systemic effects		2,9 mg/m ³	

Biological Exposure Indices:
None

8.2. Exposure controls:

Engineering controls:

Ensure adequate ventilation, especially in confined areas.
Extraction is necessary to remove fumes evolved during reflow.
Ensure good ventilation/extraction.

Respiratory protection:

Use only in well-ventilated areas.
In case of insufficient ventilation, wear suitable respiratory equipment.
Suitable respiratory protection:
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 solid grey
Odor	mild

Odour threshold	No data available / Not applicable
pH	No data available / Not applicable
Melting point	217 °C (422.6 °F)
Solidification temperature	No data available / Not applicable
Initial boiling point	259 °C (498.2 °F)
Flash point	126 °C (258.8 °F)Product is a solid.
Evaporation rate	No data available / Not applicable
Flammability	No data available / Not applicable
Explosive limits	No data available / Not applicable
Vapour pressure	< 0,1 hPa
Relative vapour density:	No data available / Not applicable
Density	3,68 g/cm3
()	
Bulk density	No data available / Not applicable
Solubility	No data available / Not applicable
Solubility (qualitative)	No data available / Not applicable
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	110.000 mPa.s
()	
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

Solder alloy will react with concentrated nitric acid to produce toxic fumes of nitrogen oxides.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

See section reactivity

10.4. Conditions to avoid

No decomposition if stored and applied as directed.

10.5. Incompatible materials

See section reactivity.

10.6. Hazardous decomposition products

Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 11: Toxicological information

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
Tin 7440-31-5	LD50	> 2.000 mg/kg	rat	OECD Guideline 423 (Acute Oral toxicity)
2-(2-hexyloxyethoxy)ethanol 112-59-4	LD50	3.488 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)
Modified rosin 144413-22-9	LD50	> 2.000 mg/kg	rat	OECD Guideline 423 (Acute Oral toxicity)
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	LD50	> 2.000 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)
rosin 8050-09-7	LD50	2.800 mg/kg	rat	not specified
Copper 7440-50-8	LD50	> 2.500 mg/kg	rat	OECD Guideline 423 (Acute Oral toxicity)
Dodecane-1-thiol 112-55-0	LD50	> 5.000 mg/kg	rat	not specified
2-hexyloxyethanol 112-25-4	LD50	738 mg/kg	rat	OECD Guideline 401 (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
Tin 7440-31-5	LD50	> 2.000 mg/kg	rat	OECD Guideline 402 (Acute Dermal Toxicity)
Modified rosin 144413-22-9	LD50	> 2.000 mg/kg	rat	OECD Guideline 402 (Acute Dermal Toxicity)
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	LD50	> 2.000 mg/kg	rat	OECD Guideline 402 (Acute Dermal Toxicity)
rosin 8050-09-7	LD50	> 2.000 mg/kg	rat	OECD Guideline 402 (Acute Dermal Toxicity)
Copper 7440-50-8	LD50	> 2.000 mg/kg	rat	OECD Guideline 402 (Acute Dermal Toxicity)
Dodecane-1-thiol 112-55-0	LD50	> 2.000 mg/kg	rat	equivalent or similar to OECD Guideline 402 (Acute Dermal Toxicity)
2-hexyloxyethanol 112-25-4	LD50	757 mg/kg	rabbit	OECD Guideline 402 (Acute Dermal Toxicity)

Acute inhalative toxicity:

Fumes evolved at soldering temperatures will irritate the nose, throat and lungs. Prolonged or repeated exposure to flux fumes may result in sensitisation in sensitive workers.

Hazardous substances CAS-No.	Value type	Value	Test atmosphere	Exposure time	Species	Method
Copper 7440-50-8	LC50	> 5,11 mg/l	dust/mist	4 h	rat	OECD Guideline 436 (Acute Inhalation Toxicity: Acute Toxic Class (ATC) Method)

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
Tin 7440-31-5	not irritating		rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
2-(2-hexyloxyethoxy)ethanol 112-59-4	slightly irritating	4 h	rabbit	EU Method B.4 (Acute Toxicity: Dermal Irritation / Corrosion)
Modified rosin 144413-22-9	not irritating	4 h	rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
rosin 8050-09-7	not irritating	4 h	rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
Copper 7440-50-8	not irritating		rabbit	EU Method B.4 (Acute Toxicity: Dermal Irritation / Corrosion)
Dodecane-1-thiol 112-55-0	Category 1C (corrosive)	4 h	rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
2-hexyloxyethanol 112-25-4	corrosive		rabbit	not specified

Serious eye damage/irritation:

Solder pastes may be abrasive to the eyes and the fumes are irritating.

Hazardous substances CAS-No.	Result	Exposure time	Species	Method
Tin 7440-31-5	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
2-(2-hexyloxyethoxy)ethanol 112-59-4	Category 1 (irreversible effects on the eye)		rabbit	not specified
Modified rosin 144413-22-9	moderately irritating	24 h	rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
rosin 8050-09-7	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
Copper 7440-50-8	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
2-hexyloxyethanol 112-25-4	highly 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
2-(2-hexyloxyethoxy)ethanol 112-59-4	not sensitising	Mouse local lymphnode assay (LLNA)	mouse	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)
Modified rosin 144413-22-9	not sensitising	Guinea pig maximisation test	guinea pig	OECD Guideline 406 (Skin Sensitisation)
Copper 7440-50-8	not sensitising	Guinea pig maximisation test	guinea pig	EU Method B.6 (Skin Sensitisation)
Dodecane-1-thiol 112-55-0	sensitising	Mouse local lymphnode assay (LLNA)	mouse	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)

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
Tin 7440-31-5	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Tin 7440-31-5	negative	in vitro mammalian chromosome aberration test	with and without		OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
Tin 7440-31-5	negative	mammalian cell gene mutation assay	with and without		OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
2-(2- hexyloxyethoxy)ethanol 112-59-4	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2-(2- hexyloxyethoxy)ethanol 112-59-4	negative	sister chromatid exchange assay in mammalian cells	with and without		OECD Guideline 479 (Genetic Toxicology: In Vitro Sister Chromatid Exchange Assay in Mammalian Cells)
2-(2- hexyloxyethoxy)ethanol 112-59-4	negative	mammalian cell gene mutation assay	with and without		OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
Modified rosin 144413-22-9	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Modified rosin 144413-22-9	negative	in vitro mammalian chromosome aberration test	with and without		OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	negative	in vitro mammalian cell micronucleus test	with and without		OECD Guideline 487 (In vitro Mammalian Cell Micronucleus Test)
rosin 8050-09-7	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Copper 7440-50-8	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Dodecane-1-thiol 112-55-0	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Dodecane-1-thiol 112-55-0	negative	mammalian cell gene mutation assay	with and without		OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
2-hexyloxyethanol 112-25-4	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2-hexyloxyethanol 112-25-4	negative	in vitro mammalian chromosome aberration test	with and without		OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
2-hexyloxyethanol 112-25-4	negative	mammalian cell gene mutation assay	with and without		OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
2-(2- hexyloxyethoxy)ethanol 112-59-4	negative	oral: gavage		rat	OECD Guideline 475 (Mammalian Bone Marrow Chromosome Aberration Test)
Copper 7440-50-8	negative	oral: gavage		mouse	EU Method B.12 (Mutagenicity)
Copper 7440-50-8	negative	oral: gavage		rat	equivalent or similar to OECD Guideline 486 (Unscheduled DNA Synthesis (UDS) Test with Mammalian Liver Cells in vivo)
Dodecane-1-thiol 112-55-0	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
Tin 7440-31-5	NOAEL P > 1.000 mg/kg		oral: gavage	rat	OECD Guideline 421 (Reproduction / Developmental Toxicity Screening Test)
2-(2- hexyloxyethoxy)ethanol 112-59-4	NOAEL P >= 1.000 mg/kg NOAEL F1 >= 1.000 mg/kg	screening	oral: feed	rat	OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)
Copper 7440-50-8	NOAEL P 1500 ppm NOAEL F1 1000 ppm NOAEL F2 1000 ppm	two- generation study	oral: feed	rat	OECD Guideline 416 (Two- Generation Reproduction Toxicity Study)
Copper 7440-50-8	NOAEL P 1000 ppm NOAEL F1 1000 ppm NOAEL F2 1000 ppm	two- generation study	oral: feed	rat	OECD Guideline 416 (Two- Generation Reproduction Toxicity Study)
2-hexyloxyethanol 112-25-4	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
Tin 7440-31-5	NOAEL > 1.000 mg/kg	oral: gavage	28 days daily	rat	OECD Guideline 407 (Repeated Dose 28-Day Oral Toxicity in Rodents)
2-(2- hexyloxyethoxy)ethanol 112-59-4	NOAEL 300 mg/kg	oral: feed	33-52 d daily	rat	OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)
2-(2- hexyloxyethoxy)ethanol 112-59-4	NOAEL 41 ppm	inhalation: vapour	14 w 6 h/d	rat	equivalent or similar to OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day)
Modified rosin 144413-22-9	NOAEL 150 mg/kg	oral: gavage	28 d daily	rat	OECD Guideline 407 (Repeated Dose 28-Day Oral Toxicity in Rodents)
Copper 7440-50-8	NOAEL 1000 ppm	oral: feed	92 d 7 d/w	rat	EU Method B.26 (Sub- Chronic Oral Toxicity Test: Repeated Dose 90- Day Oral Toxicity Study in Rodents)
2-hexyloxyethanol 112-25-4	NOAEL 222 mg/kg	dermal	11 d 6 h/d	rabbit	OECD Guideline 410 (Repeated Dose Dermal Toxicity: 21/28-Day Study)
2-hexyloxyethanol 112-25-4	NOAEL 41 ppm	inhalation: vapour	14 w 6 h/d	rat	OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day)

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
Tin 7440-31-5	LC50		96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)
2-(2-hexyloxyethoxy)ethanol 112-59-4	LC50	200 mg/l	96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)
Modified rosin 144413-22-9	LC50		96 h	Oncorhynchus mykiss	OECD Guideline 203 (Fish, Acute Toxicity Test)
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	LC50	0,0012 mg/l	96 h	Pimephales promelas	other guideline:
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	EC10	0,00019 mg/l	217 d	Salmo trutta	OECD Guideline 210 (fish early lite stage toxicity test)
rosin 8050-09-7	LC50		96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)
Copper 7440-50-8	LC50	0,193 mg/l	96 h	Pimephales promelas	other guideline:
Copper 7440-50-8	NOEC	0,188 mg/l	30 d	Perca fluviatilis	OECD Guideline 204 (Fish, Prolonged Toxicity Test: 14-day Study)
Dodecane-1-thiol 112-55-0	LC50		96 h	Oncorhynchus mykiss	EPA OTS 797.1400 (Fish Acute Toxicity Test)
2-hexyloxyethanol 112-25-4	LC50	140 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
2-(2-hexyloxyethoxy)ethanol 112-59-4	EC50	> 100 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Modified rosin 144413-22-9	EC50		48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	EC50	0,00022 mg/l	48 h	Daphnia magna	other guideline:
rosin 8050-09-7	EL50		48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Copper 7440-50-8	EC50	> 0,1 - 1 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Dodecane-1-thiol 112-55-0	EC50		48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
2-hexyloxyethanol 112-25-4	EC50	150 mg/l	48 h	Daphnia magna	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
Tin 7440-31-5	NOEC		7 d	Ceriodaphnia dubia	other guideline:

2-(2-hexyloxyethoxy)ethanol 112-59-4	EC10	19,63 mg/l	7 d	Ceriodaphnia dubia	other guideline:
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	NOEC	0,00032 mg/l	21 d	Daphnia magna	EPA OPPTS 850.1300 (Daphnid Chronic Toxicity Test)
Copper 7440-50-8	NOEC	> 0,1 - 1 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
Tin 7440-31-5	EC50		72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
Tin 7440-31-5	NOEC		72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-(2-hexyloxyethoxy)ethanol 112-59-4	EC50	> 100 mg/l	96 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Modified rosin 144413-22-9	EC50		72 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Modified rosin 144413-22-9	NOEC		72 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	EC10	0,00016 mg/l	15 d	other:	other guideline:
rosin 8050-09-7	EL50		72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
rosin 8050-09-7	NOELR		72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
Copper 7440-50-8	EC50	> 0,1 - 1 mg/l	72 h	not specified	OECD Guideline 201 (Alga, Growth Inhibition Test)
Copper 7440-50-8	NOEC	> 0,1 - 1 mg/l	72 h	not specified	OECD Guideline 201 (Alga, Growth Inhibition Test)
Dodecane-1-thiol 112-55-0	EC50	< 0,0145 mg/l	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
Dodecane-1-thiol 112-55-0	EC10	< 0,0145 mg/l	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-hexyloxyethanol 112-25-4	EC50	70 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
Tin 7440-31-5	EC50		3 h	activated sludge of a predominantly domestic sewage	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
Modified rosin 144413-22-9	NOEC		3 h	activated sludge	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
rosin 8050-09-7	EC20		3 h	activated sludge of a predominantly domestic sewage	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
Copper 7440-50-8	EC50	> 0,1 - 1 mg/l	3 h	activated sludge	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)

12.2. Persistence and degradability

The product is not biodegradable.

Hazardous substances CAS-No.	Result	Test type	Degradability	Exposure time	Method
2-(2-hexyloxyethoxy)ethanol 112-59-4	readily biodegradable	aerobic	> 90 - 100 %	15 d	OECD Guideline 301 A (new version) (Ready Biodegradability: DOC Die Away Test)
Modified rosin 144413-22-9	not readily biodegradable.	aerobic	25 %	28 day	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)
rosin 8050-09-7	readily biodegradable	aerobic	71 %	28 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Copper 7440-50-8	Rapidly degradable	not specified	> 60 %	28 d	OECD 301 A - F
Dodecane-1-thiol 112-55-0	not readily biodegradable.	aerobic	39,2 %	28 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
2-hexyloxyethanol 112-25-4	readily biodegradable	no data	86 %	28 d	OECD Guideline 301 E (Ready biodegradability: Modified OECD Screening Test)
2-hexyloxyethanol 112-25-4		no data	97 %	28 d	OECD Guideline 302 B (Inherent biodegradability: Zahn-Wellens/EMPA Test)

12.3. Bioaccumulative potential

Hazardous substances CAS-No.	Bioconcentration factor (BCF)	Exposure time	Temperature	Species	Method
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	70	42 d	20 °C	Cyprinus carpio	other guideline:

12.4. Mobility in soil

The product is insoluble and sinks in water.

Hazardous substances CAS-No.	LogPow	Temperature	Method
2-(2-hexyloxyethoxy)ethanol 112-59-4	1,7		not specified
Modified rosin 144413-22-9	> 6		EU Method A.8 (Partition Coefficient)
rosin 8050-09-7	> 3 - 6,2		OECD Guideline 117 (Partition Coefficient (n-octanol / water), HPLC Method)
Dodecane-1-thiol 112-55-0	> 6,5	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
Tin 7440-31-5	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
2-(2-hexyloxyethoxy)ethanol 112-59-4	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
Silver >= 99,9 % Ag in powder (>100nm<1mm) 7440-22-4	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
rosin 8050-09-7	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
Copper 7440-50-8	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
2-hexyloxyethanol 112-25-4	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:

Wherever possible unwanted solder pastes should be recycled for recovery of metal.
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.
Dispose of as unused product.

Waste code

06 04 05 - wastes containing other heavy metals

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	3077
RID	3077
ADN	3077
IMDG	3077
IATA	3077

14.2. UN proper shipping name

ADR	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (N-Dodecyl-Mercaptan)
RID	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (N-Dodecyl-Mercaptan)
ADN	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (N-Dodecyl-Mercaptan)
IMDG	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (N-Dodecyl-Mercaptan)
IATA	Environmentally hazardous substance, solid, n.o.s. (N-Dodecyl-Mercaptan)

14.3. Transport hazard class(es)

ADR	9
RID	9
ADN	9
IMDG	9
IATA	9

14.4. Packing group

ADR	III
RID	III
ADN	III
IMDG	III
IATA	III

14.5. Environmental hazards

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

14.6. Special precautions for user

ADR	not applicable
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	Tunnelcode:
RID	not applicable
ADN	not applicable
IMDG	not applicable
IATA	not applicable

The transport classifications in this section apply generally to packed and bulk goods alike. For containers with a net volume of no more than 5 L for liquid substances or a net mass of no more than 5 kg for solid substances per individual or inner package, the exemptions SP 375 (ADR), 197 (IATA), 969 (IMDG) may be applied, which can result in a deviation from the transport classification for packed goods.

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 < 3 %
(2010/75/EC)

15.2. Chemical safety assessment

A chemical safety assessment has not been carried out.

National regulations/information (Great Britain):

Remarks	<p>The Health & Safety at Work Act 1974. The Control of Substances Hazardous to Health Regulations. L5:General Approved Code of Practice to the COSHH Regulations. HS(G)97:A Step by Step Guide to the COSHH Regulations. HS(G)193: COSHH essentials: Easy steps to control chemicals. IND (G)248L:Solder fume and you. IND(G)249L:Controlling health risks from rosin (colophony) based solder fluxes. The Control of Lead at Work Regulations. L132:Control of Lead at Work: Approved Code of Practice and Guidance. Employees should be under medical surveillance if the risk assessment made under the Control of Lead at Work Regulations indicates they are likely to be exposed to significant concentrations of lead, or if an Employment Medical Advisor or appointed doctor so certifies. A woman employed on work which exposes her to lead should notify her employer as soon as possible if she becomes pregnant. The Employment Medical Advisor / Appointed Doctor should be informed of the pregnancy. Under the Management of Health and Safety at Work Regulations, employers are required to assess the particular risks to health at work of pregnant workers and workers who have recently given birth or who are breast feeding.</p>
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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:

- H302 Harmful if swallowed.
- H311 Toxic in contact with skin.
- H312 Harmful in contact with skin.
- H314 Causes severe skin burns and eye damage.
- H317 May cause an allergic skin reaction.
- H318 Causes serious eye damage.
- 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.
- H413 May cause long lasting harmful effects to aquatic life.

Further information:

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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.

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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.