Parker Hannifin France SAS
Etablissement de Saint Ouen l'Aumône-PA du vert
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SAFETY DATA SHEET

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAK

Product identifier : **CHO-BOND 20 EPOXY HARDENER**

Product Code(s) : CHO-BOND HARDENER 20

SDS No. : PHC-055 EU

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

: Hardener. For use with CHO-BOND 360 conductive epoxy.
Use pattern: professional use.

Details of the supplier of the safety data sheet:

Parker Hannifin France
SAS-Etablissement de Saint Ouen l'Aumone-PA du vert
Galant-6/8 avenue du Vert
Galant-95310 Saint Ouen l'Aumone-France

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Unit 6 Century Point
Halifax Road, High Wycombe
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Emergency Telephone Number

: 001-352-323-3500 (INFOTRAC - U.S.)

SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

liquid - silver. Amine odour.

Most important hazards: The preparation is classified as dangerous in accordance with Directive 1999/45/EC. Classification:
Xi - Irritant
R36 - Irritating to eyes.
R43 - May cause sensitization by skin contact.
R52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Label elements

Irritant

Hazardous components which must be listed on the label: Polyamide resin.

R36 - Irritating to eyes.
R43 - May cause sensitization by skin contact.
R52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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S23 - Do not breathe fumes, vapour.
S24/25 - Avoid contact with skin and eyes.
S37/39 - Wear suitable gloves and eye/face protection.
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.
S60 - This material and its container must be disposed of as hazardous waste.

Other hazards

Other hazards which do not result in classification:
May cause irritation of respiratory tract. Incomplete toxicological data are available for this product. Silver in the form of a finely divided dust may cause discoloration in contact with skin, and argyrosis in case of inhalation. May be mildly irritating to skin and respiratory system. May cause severe irritation and corrosive damage in the mouth, throat and stomach.

Environmental precautions: Avoid release to the environment. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Use appropriate container to avoid environmental contamination.

PBT assessment: This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances

Not applicable

Mixtures

Chemical nature of the preparation: Mixture - Amines; Inorganic substances in powdered form.

The following substances shall be indicated according to legislation:

Chemical name	CAS #	EC No.	Concentration	EU Classification
Copper	7440-50-8	231-159-6	**70.0 - 100.0**	None assigned. Substances for which there are Community workplace exposure limits.
Polyamide resin	68410-23-1	Polymer	**7.0 - 13.0**	Xi - Irritant; R38 - R41 - R43 N - Dangerous for the environment; R51/53 (Supplier)
Silver metal	7440-22-4	231-131-3	**3.0 - 7.0**	None assigned. Substances for which there are Community workplace exposure limits.

For the full text of the R phrases mentioned in this section, see Section 2 or 16.

SECTION 4. FIRST-AID MEASURES

Description of first aid measures

Ingestion : Do NOT induce vomiting. Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.

Inhalation : If breathed in, move person into fresh air. If breathing is irregular or stopped, administer artificial respiration. If breathing is difficult, give oxygen by qualified medical personnel only. When symptoms persist or in all cases of doubt seek medical advice.

Skin contact : Remove/Take off immediately all contaminated clothing. Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Do not rub area of contact. Wash contaminated clothing before reuse. When symptoms persist or in all cases of doubt seek medical advice.

Eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

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Most important symptoms and effects, both acute and delayed

: Irritating to eyes.
May cause sensitization by skin contact.
May be mildly irritating to skin and respiratory system.
Incomplete toxicological data are available for this product.
Silver in the form of a finely divided dust may cause discoloration in contact with skin, and argyrosis in case of inhalation.

Indication of any immediate medical attention and special treatment needed

: Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media

: Do not use a solid water stream as it may scatter and spread fire.

Special hazards arising from the substance or mixture

: The pressure in sealed containers can increase under the influence of heat. Burning produces obnoxious and toxic fumes. In the event of fire the following can be released: Carbon oxides; Nitrogen oxides (NOx); Ammonia; Metal oxides.

Advice for firefighters

Protective equipment for fire-fighters

: Wear self-contained breathing apparatus and protective suit. Fight fire with normal precautions from a reasonable distance.

Special fire-fighting procedures

: Move containers from fire area if safe to do so. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Dike for water control.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

: Wear suitable protective equipment. Keep people away from and upwind of spill/leak.

Environmental precautions : Do not allow material to contaminate ground water system. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers, or any natural waterway or drinking supply.

Methods and material for containment and cleaning up

: Ventilate the area. Prevent further leakage or spillage if safe to do so. Eliminate all ignition sources if safe to do so. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Pick up and transfer to properly labelled containers. Contaminated absorbent material may pose the same hazards as the spilled product. Contact the proper local authorities.

Reference to other sections

: Refer to protective measures listed in sections 7 and 8. Refer to Section 13 for disposal of contaminated material.

SAFETY DATA SHEET

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SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

: Incomplete toxicological data are available for this product. Persons with recurrent skin eczema or sensitization problems should be excluded from working with this product. Once a person is sensitized, no further exposure to the material that caused the sensitization should be permitted. Use only in well-ventilated areas. Wear protective gloves/clothing and eye/face protection. Do not breathe fumes or vapours. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Keep container tightly closed. Empty containers retain residue (liquid and/or vapour) and can be dangerous. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

: Keep containers tightly closed in a cool, well-ventilated place. Keep away from heat. Inspect periodically for damage or leaks. Protect against physical damage.

Specific end use(s) : Hardener

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters

Exposure Limits:

Chemical Name	Exposure Limits	Type	Notes
Copper	0.2 mg/m³ (fumes); 1 mg/m³ (dust) (TWA) 2 mg/m³ (dust) (STEL)	France (OEL)	None.
	1 mg/m³; 0.1 mg/m³ (fumes) (TWA) 4 mg/m³; 0.4 mg/m³ (fumes) (STEL)	Hungary (OEL)	None.
	0.1 mg/m³ (inhalable) (TWA)	Netherlands (OEL)	None.
	0.2 mg/m³ (fumes); 1 mg/m³ (dust) (TWA)	Spain (OEL)	None.
	0.2 mg/m³ (fumes); 1 mg/m³ (dust) (TWA) 2 mg/m³ (dust) (STEL)	The United Kingdom (The United Kingdom (WELs))	None.
Polyamide resin	None known.	European Union (OEL)	None.
Silver metal	0.1 mg/m³ (TWA)	European Union (OEL)	None.
	0.1 mg/m³ (TWA)	France (OEL)	None.
	0.1 mg/m³ (inhalable) (TWA)	Germany (OEL)	(exposure factor 8)
	0.05 mg/m³ (TWA)	Poland (OEL)	None.
	0.1 mg/m³ (TWA)	Spain (OEL)	None.
	0.1 mg/m³ (TWA)	The United Kingdom (The United Kingdom (WELs))	None.

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Exposure controls

Ventilation and engineering measures

: Use only in well-ventilated areas. Apply technical measures to comply with the occupational exposure limits. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. In case of insufficient ventilation wear suitable respiratory equipment.

Respiratory protection : In the case of vapour formation use a respirator with an approved filter. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.

Skin protection : Wear protective gloves. The suitability for a specific workplace should be discussed with the producers of the protective gloves. The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it.

Eye / face protection : Wear protective gloves and eye/face protection. Chemical resistant goggles must be worn. See also EN 166.

Other protective equipment : Chemical resistant apron. Safety boots per regulations. Ensure that eyewash stations and safety showers are close to the workstation location.

General hygiene considerations

: Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Remove and wash contaminated clothing before re-use. Handle in accordance with good industrial hygiene and safety practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance : liquid - silver

Odour : Amine odour.

Odour threshold : No information available.

pH : No information available.

Flash point : > 260°C

Flashpoint (Method) : COC

Lower flammable limit (% by vol.)

: No information available.

Upper flammable limit (% by vol.)

: No information available.

Flammability (solid, gas) : Not applicable.

Auto-ignition temperature : No information available.

Decomposition temperature : No information available.

Oxidizing properties : None known.

Explosive properties : Not expected to be sensitive to mechanical impact or static discharge.

Initial boiling point and boiling range

: No information available.

Melting/Freezing point : No information available.

Relative density : > 1

Solubility in water : slightly soluble

Other solubility(ies) : No information available.

Vapour pressure : No information available.

Vapour density : No information available.

Partition coefficient: n-octanol/water

: No information available.

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Viscosity : No information available.
Evaporation rate (BuAe = 1) : No information available.

Other Information

Volatiles (% by weight) : No information available.
Volatile organic Compounds (VOC's)
: No information available.
Other physical/chemical comments
: No additional information.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not normally reactive.
Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions
: Hazardous polymerisation does not occur.
Conditions to avoid : Direct sources of heat. Avoid contact with incompatible materials. Do not use in areas without adequate ventilation.
Incompatible materials : Epoxides; Strong acids; Oxidizing agents.
Hazardous decomposition products
: Burning produces obnoxious and toxic fumes. In the event of fire the following can be released: Carbon oxides; Nitrogen oxides (NOx); Ammonia; metal oxides.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on Toxicological effects:

Acute toxicity : According to the classification criteria of the European Union, this product is not considered as being an acutely toxic chemical.
Irritation : The product is classified as dangerous in accordance with Directive 1999/45/EC.
Classification:
Xi - Irritant; R36 - Irritating to eyes.
Corrosivity : According to the classification criteria of the European Union, this product is not considered as being a corrosive material.
Sensitisation : The product is classified as dangerous in accordance with Directive 1999/45/EC.
Classification:
Xi - Irritant; R43 - May cause sensitization by skin contact.
Mutagenicity : Contains no ingredient listed as a mutagen.
Carcinogenicity : Contains no ingredient listed as a carcinogen
Reproductive toxicity : Contains no ingredient listed as toxic to reproduction.
Repeated dose toxicity : According to the classification criteria of the European Union, this product is not expected to cause target organ toxicity through repeated doses.
Toxicological data : There is no available data for the product itself, only for the ingredients. See below for individual ingredient acute toxicity data.

Chemical name	LC_{50}(4hr) inh, rat	LD_{50} (Oral, rat)	LD_{50} (Rabbit, dermal)
Copper	No information available.	> 2500 mg/kg	> 2000 mg/kg
Polyamide resin	No information available.	No information available.	No information available.
Silver metal	No information available.	> 2000 mg/kg	No information available.

Routes of exposure : Eye contact; Skin contact; Inhalation; Ingestion.

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Effects of acute exposure : Inhalation: May cause irritation of the mucous membranes. Inhalation may provoke the following symptoms: Cough; Shortness of breath; Breathing difficulties.

Skin contact: May cause mild skin irritation.

Eye contact: Irritating to eyes. May cause moderate to severe irritation.

Ingestion: May cause severe irritation and corrosive damage in the mouth, throat and stomach.

Potential Chronic Health Effects : Silver in the form of a finely divided dust may cause discoloration in contact with skin, and argyrosis in case of inhalation.

Other important hazards : Incomplete toxicological data are available for this product.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product itself has not been tested. Should not be released into the environment. The product contains the following substances which are hazardous for the environment: Polyamide resin.

The acute toxicity of polyamide resin is (manufacturer):
Toxicity to fish - LC50 = 1 - 10 mg/L

Persistence and degradability : The product itself has not been tested.

Bioaccumulation potential : The product itself has not been tested.

Mobility in soil : The product itself has not been tested.

Results of PBT and vPvB assessment : This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

Other Adverse Environmental effects : None known.

Water contaminating class (Germany) : 2 (self classified)

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods:

Handling for Disposal : Handle in accordance with good industrial hygiene and safety practice. Refer to protective measures listed in sections 7 and 8.

Methods of Disposal : Dispose of in accordance with the European Directives on waste and hazardous waste. Waste must be classified and labelled prior to recycling or disposal. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14. TRANSPORTATION INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
ADR/RID	None.	not regulated	Not regulated	none	

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EU ADR/RID Classification Code	Not applicable.				
EU ADR / RID Hazard Identification Number	Not applicable.				
ADR/RID Additional information	Not classified as dangerous for conveyance in the meaning of the regulations for the transport of dangerous goods by road and rail.				
ICAO/IATA	None.	Not regulated.	Not regulated	none	
ICAO/IATA Additional information	None.				
IMDG	None.	Not regulated.	Not regulated	none	
IMDG Additional information	None.				

Special precautions for user : Appropriate advice on safety must accompany the package. Wear chemically resistant protective equipment during handling.

Environmental hazards : This product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code. See Section 12 for more environmental information.

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

: Not applicable.

SECTION 15. REGULATORY INFORMATION

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

: 1. Substances presenting a health or environmental hazard within the meaning of Directive 67/548/EEC.
2. Classification according to European directive on classification of hazardous preparations 1999/45/EC.
3. This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.
4. In accordance with the legislation of the United Kingdom.
5. German legislation on water endangering substances VwVwS (see Section 12) .

Chemical safety assessment : A chemical safety assessment has not been carried out by the Manufacturer of this product.

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SECTION 16. OTHER INFORMATION

Legend : ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS: Chemical Abstract Services
EC: European Community
EEC: European Economic Community
EINECS: European Inventory of Existing Commercial chemical Substances
EN: European Standard
EU: European Union
HSDB: Hazardous Substances Data Bank
IATA: International Air Transport Association
IBC: Intermediate Bulk Container
ICAO: International Civil Aviation Organisation
IMDG: International Maritime Dangerous Goods
LC: Lethal Concentration
LD: Lethal Dose
OEL: National occupational exposure limits
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail
RTECS: Registry of Toxic Effects of Chemical Substances
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit
TWA: Time Weighted Average
WEL: Workplace Exposure Limit

Information Source : 1. Material Safety Data Sheet from manufacturer.
2. Canadian Centre for Occupational Health and Safety, CCInfoWeb Databases, 2012 (Chempendium, RTECs, HSDB, INCHEM).
3. European Chemicals Bureau, Existing Chemicals Work Area, EINECS Information System, 2012.
4. European Chemicals Agency, Classification Legislation, 2012.
5. OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2012.

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Revision Information : (M)SDS sections updated:
2. HAZARDS IDENTIFICATION;
3. COMPOSITION/INFORMATION ON INGREDIENTS;
4. FIRST AID MEASURES;
6. ACCIDENTAL RELEASE MEASURES;
7. HANDLING AND STORAGE;
9. PHYSICAL AND CHEMICAL PROPERTIES;
10. STABILITY AND REACTIVITY;
11. TOXICOLOGICAL INFORMATION;
14. TRANSPORT INFORMATION;
15. REGULATORY INFORMATION

R-Phrases (Full text) : R38 - Irritating to skin.
R41 - Risk of serious damage to eyes.
R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Refer to section 2 for additional R phrases not listed here.

Other special considerations for handling
: Provide adequate information, instruction and training for operators.

SAFETY DATA SHEET

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

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