Gardobond X 4707E4

Version: 8.0 Revision Date 29.03.2016 Print Date 31.03.2016

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

1.1 Product identifier

Trade name : Gardobond X 4707E4

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

Use of the Substance/Mixture : Pre-treatment of metal surfaces.

1.3 Details of the supplier of the safety data sheet

Company : Chemetall Ltd
Denbigh Road
Bletchley Milton Keynes MK1 1PB
Telephone : 01908 649333
Telefax : 01908 373939

Contact person product safety Dr. Wanda Brambilla
Telephone : +39 0362 315.476
E-mail address : msds.it@chemetall.com

1.4 Emergency telephone number

Emergency telephone number : 01908 649333

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 3	H301: Toxic if swallowed.
Acute toxicity, Category 4	H332: Harmful if inhaled.
Acute toxicity, Category 2	H310: Fatal in contact with skin.
Skin corrosion, Category 1B	H314: Causes severe skin burns and eye damage.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word	:	Danger	
Hazard statements	:	H301	Toxic if swallowed.
		H310	Fatal in contact with skin.
		H314	Causes severe skin burns and eye damage.
		H332	Harmful if inhaled.
Precautionary statements	:	**Prevention:**	
		P262	Do not get in eyes, on skin, or on clothing.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
		Response:	
		P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
		P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P310	Immediately call a POISON CENTER or doctor/ physician.

Hazardous components which must be listed on the label:
- 1341-49-7 Ammonium hydrogendifluoride
- 7664-39-3 Hydrofluoric Acid

2.3 Other hazards

Symptoms of poisoning may appear several hours later.

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Hazardous components

Chemical Name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]

Ammonium hydrogendifluoride	1341-49-7 215-676-4 01-2119489180-38	Acute Tox. 3; H301 Skin Corr. 1B; H314	>= 3 - < 5
Hydrofluoric Acid	7664-39-3 231-634-8 01-2119458860-33	Acute Tox. 2; H330 Acute Tox. 1; H310 Acute Tox. 2; H300 Skin Corr. 1A; H314 Note B	>= 2.5 - < 5
Hexafluorotitanic acid	17439-11-1 241-460-4 01-2119978266-24	Met. Corr. 1; H290 Acute Tox. 3; H301 Acute Tox. 3; H331 Acute Tox. 3; H311 Skin Corr. 1B; H314	>= 1 - < 2.5
Ammonium fluoride	12125-01-8 235-185-9	Acute Tox. 3; H301 Acute Tox. 3; H331 Acute Tox. 3; H311	>= 1 - < 2.5
Hexafluorozirconic acid	12021-95-3 234-666-0 01-2119978267-22	Met. Corr. 1; H290 Acute Tox. 3; H301 Acute Tox. 3; H311 Acute Tox. 3; H331 Skin Corr. 1B; H314	>= 0.1 - < 1

For the full text of the H-Statements mentioned in this Section, see Section 16.
For the full text of the Notas mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice	:	Take off contaminated clothing and shoes immediately. First Aid responders should pay attention to self-protection and use the recommended protective clothing Symptoms of poisoning may appear several hours later. Keep warm and in a quiet place. For effective first-aid, special training / education is needed. Medical supervision for minimum 48 hours.
If inhaled	:	Move out of dangerous area. Ensure adequate ventilation. Call a physician immediately.
In case of skin contact	:	Take off all contaminated clothing immediately. Wash off immediately with plenty of water for at least 15 minutes. First treatment with calcium gluconate paste. Immediately drink calcium solution (calcium tablets dissolved in water). Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty. Take victim immediately to hospital.
In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Protect unharmed eye. Call a physician immediately.
If swallowed	:	Do NOT induce vomiting. Rinse mouth with water. Immediately drink calcium solution (calcium tablets dissolved in water). Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

Risks	:	Extremely corrosive and destructive to tissue. Poisoning by resorption through skin possible. Watch victim for several hours because of possible delayed signs of poisoning. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	Immediately drink calcium solution (calcium tablets dissolved in water). First treatment with calcium gluconate paste. For specialist advice physicians should contact the Poisons Information Service.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting	:	Heating or fire can release toxic gas. Hydrogen fluoride

5.3 Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus. Special protective equipment for firefighters
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Wear personal protective equipment. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas.

6.2 Environmental precautions

Environmental precautions	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up	:	Use neutralizing agents. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for dis-

posal according to local regulations (see section 13).
Dispose of as special waste in compliance with local and national regulations.
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

6.4 Reference to other sections

See chapter 8 and 13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Do not breathe vapours, aerosols. Wear personal protective equipment. Provide sufficient air exchange and/or exhaust in work rooms. Avoid contact with skin and eyes. Avoid formation of aerosol. Ensure that eye flushing systems and safety showers are located close to the working place. To avoid risks to man and the environment, comply with the instructions for use.
Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Store in a place accessible by authorized persons only. Store in original container. Keep containers tightly closed in a cool, well-ventilated place. To maintain product quality, do not store in heat or direct sunlight.
Further information on storage conditions	:	Avoid contact with metals.
Advice on common storage	:	Incompatible with bases.

7.3 Specific end use(s)

Specific use(s)	:	Pre-treatment of metal surfaces.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value	Control parameters	Update	Basis
Ammonium hydrogendifluoride	1341-49-7	TWA	2.5 mg/m3 Measured as fluoride	2005-04-06	GB EH40
Further information	:	2: Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used Measured as fluoride			
		TWA	2.5 mg/m3 Fluorine	2009-12-19	2000/39/EC
Further information	:	Indicative Fluorine			
		TWA	2.5 mg/m3 Fluorine	2007-08-01	GB EH40
Further information	:	2: Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used Fluorine			
Hydrofluoric Acid	7664-39-3	TWA	1.8 ppm 1.5 mg/m3	2009-12-19	2000/39/EC
Further information	:	Indicative			
		STEL	3 ppm 2.5 mg/m3	2009-12-19	2000/39/EC
Further information	:	Indicative			
		TWA	1.8 ppm Fluorine 1.5 mg/m3 Fluorine	2005-04-06	GB EH40
Further information	:	Fluorine			
		STEL	3 ppm Fluorine 2.5 mg/m3 Fluorine	2005-04-06	GB EH40

Further information	: Fluorine				
Hexafluorotitanic acid	17439-11-1	TWA	2.5 mg/m3	2000-06-16	2000/39/EC
Further information	: Indicative				
		TWA	2.5 mg/m3 Fluorine	2007-08-01	GB EH40
Further information	: 2: Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used Fluorine				
Ammonium fluoride	12125-01-8	TWA	2.5 mg/m3 Fluorine	2009-12-19	2000/39/EC
Further information	: Indicative Fluorine				
		TWA	2.5 mg/m3 Fluorine	2007-08-01	GB EH40
Further information	: 2: Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used Fluorine				
Hexafluorozirconic acid	12021-95-3	TWA	2.5 mg/m3	2000-06-16	2000/39/EC
Further information	: Indicative				
		TWA	2.5 mg/m3 Fluorine	2007-08-01	GB EH40
Further information	: 2: Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used Fluorine				
		TWA	5 mg/m3 Zirconium	2005-04-06	GB EH40
Further information	: Zirconium				
		STEL	10 mg/m3 Zirconium	2005-04-06	GB EH40

Further information	:	Zirconium			

DNEL/DMEL

Ammonium hydrogendifluoride	:	End Use: Workers DNEL Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 2.3 mg/m3
Hydrofluoric Acid	:	End Use: Workers DNEL Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 1.5 mg/m3 End Use: Workers DNEL Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 0.0015 mg/m3
Hexafluorotitanic acid	:	End Use: Workers DNEL Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 3.6 mg/m3 End Use: Workers DNEL Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 3.6 mg/m3 End Use: Workers DNEL Exposure routes: Inhalation Potential health effects: Acute systemic effects Value: 3.6 mg/m3 End Use: Workers DNEL Exposure routes: Skin contact Potential health effects: Long-term systemic effects Value: 52 mg/kg bw/day End Use: Workers DNEL Exposure routes: Skin contact Potential health effects: Acute systemic effects Value: 52 mg/kg bw/day

PNEC

Ammonium hydrogendifluoride	:	Fresh water Value: 1.3 mg/l Soil Value: 22 mg/kg
Hexafluorotitanic acid	:	Fresh water Value: 0.89 mg/l Marine water Value: 0.89 mg/l Intermittent use/release Value: 0.074 mg/l Sewage treatment plant Value: 1.02 mg/l Fresh water sediment Value: 16.69 mg/kg dry weight (d.w.) Marine sediment Value: 4.89 mg/kg dry weight (d.w.) Soil Value: 13 mg/kg dry weight (d.w.)

8.2 Exposure controls

Engineering measures

Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Respiratory protection	:	Self-contained breathing apparatus (EN 133)
Hand protection	:	Protective gloves complying with EN 374. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
	:	Fluorinated rubber Break through time: 480 min Glove thickness: 0.4 mm

: Nitrile rubber
Break through time: 480 min
Glove thickness: 0.35 mm

: butyl-rubber
Break through time: 480 min
Glove thickness: 0.5 mm

: Natural Rubber
Break through time: 480 min
Glove thickness: 0.5 mm

: PVC
Break through time: 480 min
Glove thickness: 0.5 mm

: Polychloroprene
Break through time: 480 min
Glove thickness: 0.5 mm

Eye protection : Tightly fitting safety goggles
Eye protection (EN 166)

Skin and body protection : Chemical resistant protective clothing according to DIN EN 13034 (Type 6)

Hygiene measures : Do not breathe spray, vapour.
Take off contaminated clothing and shoes immediately.
Avoid contact with skin and eyes.
Keep away from food, drink and animal feedingstuffs.
Wash hands before breaks and immediately after handling the product.

Protective measures : Avoid formation of aerosol.
Always have on hand a first-aid kit, together with proper instructions.
Handle in accordance with good industrial hygiene and safety practice.
Ensure that eye flushing systems and safety showers are located close to the working place.

Environmental exposure controls

General advice : Do not flush into surface water or sanitary sewer system.
Avoid subsoil penetration.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	liquid clear
Colour	:	colourless
Odour	:	odourless
Flash point	:	Not applicable
pH	:	2.9 at 10 g/l 20 °C
Boiling point/boiling range	:	No data available
Vapour pressure	:	No data available
Density	:	1.046 g/cm³ at 20 °C

9.2 Other information

Explosivity	:	no explosion risk

SECTION 10: Stability and reactivity

10.1 Reactivity

Contact with light-metals liberates hydrogen.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	Gives off hydrogen by reaction with metals.

10.4 Conditions to avoid

Conditions to avoid	:	To avoid thermal decomposition, do not overheat.

10.5 Incompatible materials

Materials to avoid	:	glass Attacks silicate containing materials. Metals Incompatible with bases.

10.6 Hazardous decomposition products

Risk of decomposition.	:	Heating can release hazardous gases.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity	:	Acute toxicity estimate: 167.07 mg/kg Method: Calculation method
Acute oral toxicity Ammonium hydrogendifluoride	:	LD50: 60 - 130 mg/kg Species: Rat
Hydrofluoric Acid	:	Acute toxicity estimate: 5 mg/kg Method: Converted acute toxicity point estimate
Ammonium fluoride	:	Acute toxicity estimate: 100 mg/kg Method: Converted acute toxicity point estimate
Acute inhalation toxicity	:	Acute toxicity estimate: 15.02 mg/l vapour Exposure time: 4 h Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate: 190.23 mg/kg Method: Calculation method
Acute dermal toxicity Hydrofluoric Acid	:	Acute toxicity estimate: 5 mg/kg

Method: Converted acute toxicity point estimate

Ammonium fluoride : Acute toxicity estimate: 300 mg/kg
Method: Converted acute toxicity point estimate

Skin corrosion/irritation

Skin irritation : Causes severe skin burns and eye damage.

Serious eye damage/eye irritation

Eye irritation : Causes serious eye damage.

Respiratory or skin sensitisation

Sensitisation : No data available

Human experience : Causes very severe, deep burns which generally heal badly.,
Poisoning by resorption through skin possible.

Further information : Toxic if swallowed.
Fatal in contact with skin.
Harmful if inhaled.

SECTION 12: Ecological information

12.1 Toxicity

Ecotoxicology studies for the product are not available.

Toxicity to fish
Ammonium hydrogendifluoride : LC50: 422 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)

12.2 Persistence and degradability

Biodegradability : No data available

12.3 Bioaccumulative potential

Bioaccumulation : Bioaccumulation is unlikely.

12.4 Mobility in soil

Mobility	:	No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Additional ecological information	:	Avoid subsoil penetration. Do not flush into surface water or sanitary sewer system. Even leakage of small amounts in the subsoil can contaminate drinking water. water endangering

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	In accordance with local and national regulations.
Contaminated packaging	:	Dispose of as unused product.
Waste Code	:	Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

SECTION 14: Transport information

ADR

UN number	:	2922
UN proper shipping name	:	CORROSIVE LIQUID, TOXIC, N.O.S. Hexafluorotitanic acid, Hydrofluoric Acid
Transport hazard class(es)	:	8
Packing group	:	II
Classification Code	:	CT1
Hazard Identification Number	:	86
Limited Quantity (LQ) Inner Packaging	:	1.00 L
Maximum quantity	:	30.00 KG
Labels	:	8 (6.1)
Tunnel restriction code	:	(E)
Environmentally hazardous	:	no

IATA

UN number	:	2922
Description of the goods	:	Corrosive liquid, toxic, n.o.s. Hexafluorotitanic acid, Hydrofluoric Acid
Class	:	8
Packing group	:	II
Labels	:	8 (6.1)

IATA_C

Packing instruction (cargo aircraft)	:	855
Packing instruction (LQ)	:	Y840
Maximum quantity	:	30.00 L
Environmentally hazardous	:	no

IATA_P

Packing instruction (passenger aircraft)	:	851
Packing instruction (LQ)	:	Y840
Maximum quantity	:	1.00 L
Environmentally hazardous	:	no

IMDG

UN number	:	2922
Description of the goods	:	CORROSIVE LIQUID, TOXIC, N.O.S. Hexafluorotitanic acid, Hydrofluoric Acid
Class	:	8
Packing group	:	II
Labels	:	8 (6.1)
EmS Number 1	:	F-A
EmS Number 2	:	S-B
Limited Quantity (LQ) Inner Packaging	:	1.00 L
Marine pollutant	:	no **Acids** **Clear of living quarters.** **Acids** **Clear of living quarters.**

RID

UN number	:	2922
Description of the goods	:	CORROSIVE LIQUID, TOXIC, N.O.S.Hexafluorotitanic acid , Hydrofluoric Acid
Transport hazard class(es)	:	8
Packing group	:	II
Classification Code	:	CT1
Hazard Identification Number	:	86
Labels	:	8 (6.1)

Limited Quantity (LQ) Inner Packaging	:	1.00 L
Maximum quantity	:	30.00 KG
Environmentally hazardous	:	no

SECTION 15: Regulatory information

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

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Not applicable
Water contaminating class (Germany)	:	WGK 2 water endangering VWVWS A4
Other regulations	:	The product is classified and labelled in accordance with EC directives or respective national laws. Regional or national implementations of GHS may not implement all hazard classes and categories.

15.2 Chemical Safety Assessment

For a mixture it is not mandatory to include an exposure scenario in the material safety data sheet.
The necessary safety - related information is stated in the first 16 sections.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals.
H300	Fatal if swallowed.
H301	Toxic if swallowed.
H310	Fatal in contact with skin.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.

Full text of Notas referred to under section 3

Note B	Some substances (acids, bases, etc.) are placed on the market in aqueous solutions at various concentrations and, therefore, these solutions require different classification and labelling since the hazards vary at different concentrations. In Part 3 entries with Note B have a general designation of the following type: "nitric acid .?.%". In this case the supplier must state the percentage concentration of the solution on the label. Unless otherwise stated, it is assumed that the percentage concentration is calculated on a weight/weight basis.

Further information

The information provided is based on our current knowledge and experience and apply to the product as delivered. Regarding the product properties, these are not guaranteed. The delivery of this safety datasheet does not free the recipient of the product from his own responsibility to follow the relevant rules and regulations concerning this product.

This data sheet contains changes from the previous version in section(s): 3