SAFETY DATA SHEET (SDS)

PRODUCT NAME : GRC Cartridge C150A

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

1.1 Product identifier

Product name:	Gas Reactor Column (GRC) Cartridge Type C150A
Other means of identification:	None
Item numbers:	Does not have an Edwards part number; referred to by the product name

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

Only to be used for gas abatement from etch and CVD semiconductor processing.

1.3 Details of the supplier of the safety data sheet

UK contact details	US contact details
Edwards, Innovation Drive, Burgess Hill, West Sussex, RH15 9TW, United Kingdom	Edwards, 6416 Inducon Drive West, Sanborn, New York, 14132, USA
General enquiries Tel: +44 (0)8459 212223 Email: info@edwardsvacuum.com	General enquiries Toll Free: 1-800-848-9800

1.4 Emergency telephone number

Emergency phone +44 (0)1293 565690

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS classification:	Mixture.
Classification according to Regulation (EC) No. 1272/2008:	Skin irritation (Category 2) Serious eye damage (Category 1) Specific target organ toxicity - single exposure (Category 3) Carcinogenicity, Inhalation (Category 1A) Skin sensitization (Category 1) Specific target organ toxicity - repeated exposure (Category 1)

PRODUCT NAME : GRC Cartridge C150A

Classification according to Directive 1999/45/EC: Irritating to respiratory system and skin. Risk of serious damage to eyes. May cause cancer by inhalation. Toxic: danger of serious damage to health by prolonged exposure through inhalation. May cause sensitization by skin contact. May cause long-term adverse effects in the aquatic environment.

2.2 Label elements

Label elements according to Regulation (EC) No 1272/2008

Hazard pictograms:

Signal words: Danger

Hazard statements:
H315 - Causes skin irritation.
H318 - Causes serious eye damage.
H335 - May cause respiratory irritation.
H350i - May cause cancer by inhalation.
H317 - May cause an allergic skin reaction.
H372 - Causes damage to organs through prolonged or repeated exposure.

Precautionary statements:
P261 - Avoid breathing dust.
P280 - Wear protective gloves/protective clothing/eye protection.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P314 - Get Medical advice/attention if you feel unwell.
P501 - Dispose of contents/container to an approved waste disposal plant.

Label elements according to European Directive 1999/45/EC as amended

Hazard pictograms:

R-phrase(s):
R37/38 - Irritating to respiratory system and skin.
R41 - Risk of serious damage to eyes.
R49 - May cause cancer by inhalation.
R48/23 - Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R43 - May cause sensitization by skin contact.

S-phrase(s):
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S39 - Wear eye/face protection.

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S61 - Avoid release to the environment. Refer to the special instructions/safety data sheets.

2.3 Other hazards

PBT criteria: This mixture does not contain any substances that are assessed to be a PBT.

vPvB criteria: This mixture does not contain any substances that are assessed to be a vPvB.

Other hazards which do not result in a classification: None.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable.

3.2 Mixtures

Name	CAS-No.	EC-No.	Weight %	Classification according to 67/548/EEC or 1999/45/EC	Classification according to Regulation (EC) No. 1278/2008 (CLP)
Nickel (II) Oxide	1313-99-1	215-215-7	10-20	Carc. Cat 1; R49 Toxic; T, R48/R23, R43	Carcinogenicity 1A, H350i Skin sensitisation 1, H317 Organ toxicity 1, H372
Calcium Oxide	1305-78-8	215-138-9	5-15	Irritant; Xi, R37/38, R41	Skin irritation 2, H315 Eye damage 1, H318 Organ toxicity 3, H335
At the concentrations present in the mixture, the following constituents are not classified as dangerous according to Directive 67/548/EEC and are not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.					
Aluminium Oxide	1344-28-1	215-691-6	40-50	Not applicable	Not applicable
The following constituents have Community workplace exposure limits, but at the concentrations present in the mixture are not classified as dangerous according to Directive 67/548/EEC and are not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.					
Silicon	7440-21-3	231-130-8	20-30	Not applicable	Not applicable

PRODUCT NAME : GRC Cartridge C150A

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

Eyes:	Rinse thoroughly with plenty of water for at least 15 minutes and obtain medical attention immediately. Clumps of Calcium Hydroxide formed by reaction with moisture and proteins in the eye are difficult to remove by irrigation.
Skin:	Wash off with soap and plenty of water. If necessary seek medical advice.
Ingestion/Oral:	Never give anything by mouth to an unconscious person. Rinse mouth with water. DO NOT induce vomiting. Obtain medical attention immediately.
Inhalation:	If breathed in, move person to fresh air. If not breathing, give artificial respiration. Obtain medical attention immediately.
General advice:	Consult a physician for all exposures except for minor instances. Show this safety data sheet to the doctor in attendance.

4.2 Most important symptoms and effect, both acute and delayed

Potential acute health effects:	
Eyes:	Redness, pain, blurred vision, severe deep burns.
Skin:	Dry skin, redness, burning sensation, skin burns, pain.
Ingestion / Oral:	Burning sensation, abdominal pain, abdominal cramps, vomiting, diarrhoea.
Inhalation:	Cough, shortness of breath, headache, nausea, vomiting.
Over-exposure symptoms:	
Eyes:	No data available.
Skin:	No data available.
Ingestion / Oral:	No data available.
Inhalation:	No data available.

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

This product is not flammable, is non-combustible and inhibits the spread of flame.

Suitable extinguishing media:	Alcohol-resistant foam, dry chemical powder or Carbon Dioxide.
Unsuitable extinguishing media:	Avoid water and humidification of the material.

5.2 Special hazards arising from the substance or mixture

Fire and explosion hazard:	Heat generated from contact with water may cause risk to flammable material.
Hazardous combustion products	Not applicable.

5.3 Advice for fire-fighters

Special precautions for fire-fighters:	Avoid generation of dust.
Special protective equipment for fire-fighters:	Wear Self-Contained Breathing Apparatus (SCBA) with chemical resistant gloves.

For Flammability Properties - see Section 9.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:	Use personal protective equipment. Avoid dust formation. Avoid breathing dust, vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For emergency responders:	No data available.

6.2 Environmental precautions:

Contain any spillage. Keep the material dry if possible. Cover area if possible to avoid unnecessary dust hazard. Do not let product enter drains or ground water.

6.3 Methods and material for containment and cleaning up

Pick up and arrange disposal without creating dust. Use vacuum suction removal or shovel into bags, keep product dry. Keep in suitable (non-aluminium), closed containers for disposal.

6.4 Reference to other sections

Refer to Section 8 for information on personal protective equipment.

Refer to Section 13 for information on disposal considerations.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

The contents of the cartridge are sealed inside a stainless steel welded vessel and do not present a hazard during normal handling and storage. Keep end closures in place until cartridge is installed.

If the contents are exposed, avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool place in original packaging until required for use. Keep cartridge tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)

This product must only be used for the purpose of gas abatement from etch and CVD semiconductor processing according to the instructions for use identified by the supplier. In no circumstances shall the product be used in other manufacturer's abatement equipment.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Ingredient	ACGIH - TLV	OSHA - PEL	Occupational Exposure Limits EH40 (UK)
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	5.0 mg m^{-3} - 8 hr TWA	2.0 mg m^{-3} - 8 hr TWA
Nickel (II) Oxide	No data available	1.0 mg m^{-3} - 8 hr TWA	0.5 mg m^{-3} - 8 hr TWA (as Ni)
Silicon	15.0 mg m^{-3} - 8 hr TWA (total dust) 5.0 mg m^{-3} - 8 hr TWA (respirable fraction)	No data available	10.0 mg m^{-3} - 8 hr TWA (inhalable dust) 4.0 mg m^{-3} - 8 hr TWA (respirable dust)

Country/Ingredient	Exposure Limit	Basis
Australia		Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment.
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	No data available	
Silicon	10.0 mg m^{-3} - 8 hr TWA (inspirable dust containing no asbestos and <1% crystalline silica).	
Austria		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA 4.0 mg m^{-3} - STEL	
Nickel (II) Oxide	0.5 mg m^{-3} - 8 hr TWA 2.0 mg m^{-3} - STEL	
Silicon	No data available	

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Country/Ingredient	Exposure Limit	Basis
Belgium		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	0.2 mg m^{-3} - 8 hr TWA	
Silicon	10.0 mg m^{-3} - 8 hr TWA	
Canada		Occupational Health and Safety Code - OEL
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	0.2 mg m^{-3} - 8 hr TWA	
Silicon	10.0 mg m^{-3} - 8 hr TWA (total dust) 3.0 mg m^{-3} - 8 hr TWA (respirable fraction)	
China		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Czech Republic		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA 4.0 mg m^{-3} - STEL	
Nickel (II) Oxide	0.05 mg m^{-3} - 8 hr TWA	
Silicon	No data available	
Denmark		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	0.05 mg m^{-3} - 8 hr TWA	
Silicon	10.0 mg m^{-3} - 8 hr TWA	
Finland		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	0.1 mg m^{-3} - 8 hr TWA	
Silicon	No data available	
France		No data available
Calcium Oxide	No data available	
Nickel (II) Oxide	1.0 mg m^{-3} - 8 hr TWA	
Silicon	10.0 mg m^{-3} - 8 hr TWA	

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Country/Ingredient	Exposure Limit	Basis
Germany		No data available
Calcium Oxide	No data available	
Nickel (II) Oxide	No data available	
Silicon	No data available	
India		Factories Act, 1948 Section 41F. Permissible limits of exposure of chemical and toxic substances
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Ireland		List of Chemical Agents and Occupational Exposure Limit Values - Schedule 1
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	No data available	
Silicon	10.0 mg m^{-3} - 8 hr TWA (inhalable dust) 4.0 mg m^{-3} - 8 hr TWA (respirable dust)	
Israel		No data available
Calcium Oxide	No data available	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Italy		No data available
Calcium Oxide	No data available	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Japan		No data available
Calcium Oxide	No data available	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Malaysia		No data available
Calcium Oxide	No data available	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Netherlands		No public limit values set
Calcium Oxide	No data available	
Nickel (II) Oxide	No data available	
Silicon	No data available	

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Country/Ingredient	Exposure Limit	Basis
Norway		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	0.05 mg m^{-3} - 8 hr TWA	
Silicon	10.0 mg m^{-3} - 8 hr TWA	
Portugal		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Russian Federation		No data available
Calcium Oxide	No data available	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Saudi Arabia		No data available
Calcium Oxide	No data available	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Singapore		Workplace Safety & Health Regulations - PEL
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	No data available	
Silicon	10.0 mg m^{-3} - 8 hr TWA	
South Korea		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	No data available	
Silicon	No data available	
Spain		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	0.1 mg m^{-3} - 8 hr TWA	
Silicon	No data available	
Sweden		No data available
Calcium Oxide	1.0 mg m^{-3} - 8 hr TWA 2.5 mg m^{-3} - STEL	
Nickel (II) Oxide	0.1 mg m^{-3} - 8 hr TWA	
Silicon	No data available	

Country/Ingredient	Exposure Limit	Basis
Switzerland		No data available
Calcium Oxide	2.0 mg m^{-3} - 8 hr TWA	
Nickel (II) Oxide	0.05 mg m^{-3} - 8 hr TWA	
Silicon	3.0 mg m^{-3} - 8 hr TWA	

8.2 Exposure controls

Appropriate engineering controls: The contents of the cartridge are not accessible to the user during normal operation. If handling of the contents is necessary, do so in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Individual protection measures:

(for use, as appropriate, in circumstances where contents are exposed).

Eye/Face Protection: Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Hand/Skin Protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Immersion protection
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 480 min

Splash protection
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 30 min

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hygiene Measures: As specified within 'Individual Protection measures'.

Other/General Protection: Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

PRODUCT NAME : GRC Cartridge C150A

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

The information presented below is for Nickel (II) Oxide only.

Appearance	Green-grey granules	Melting point / freezing point	Melting point: 1,955 / 3,623	ºC / ºF
Odour	None	Initial boiling point and boiling range	No data available	ºC / ºF
Odour threshold	Not applicable	Flash point	Not applicable	ºC / ºF
pH	Not applicable	Upper/lower flammability or explosive limits	Not applicable	ºC / ºF
Evaporation rate	Not applicable	Vapour pressure	Not applicable	mbar / Torr
Flammability (solid, gas)	Not applicable	Vapour density	Not applicable	g/cm^3
Solubility(ies)	Insoluble (water)	Relative density	6.7 at 25 ^oC	g/cm^3
Partition coefficient: n-octanol/water	Not applicable	Auto-ignition temperature	Not applicable	ºC / ºF
Explosive properties	Not applicable	Decomposition temperature	No data available	ºC / ºF
Oxidising properties	No data available	Viscosity	Not applicable	cSt

The information presented below is for Calcium Oxide only.

Appearance	White granules	Melting point / freezing point	Melting point/ range: 2,572 / 4,662	ºC / ºF
Odour	None	Initial boiling point and boiling range	2,800 / 5,072 literature value	ºC / ºF
Odour threshold	Not applicable	Flash point	Not applicable	ºC / ºF
pH	12.5 - 12.8 at 1.65g/l at 25 ^oC	Upper/lower flammability or explosive limits	Not applicable	ºC / ºF
Evaporation rate	Not applicable	Vapour pressure	No data available	mbar / Torr
Flammability (solid, gas)	No data available	Vapour density	No data available	g/cm^3
Solubility(ies)	1.2 g/l at 25 ^oC reacts to form $Ca(OH)_2$	Relative density	3.3 at 25 ^oC	g/cm^3
Partition coefficient: n-octanol/water	No data available	Auto-ignition temperature	No data available	ºC / ºF
Explosive properties	Not applicable	Decomposition temperature	No data available	ºC / ºF
Oxidising properties	No data available	Viscosity	Not applicable	cSt

9.2 Other information

No additional information.

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity

Calcium Oxide reacts exothermically with water to form Calcium Hydroxide Ca(OH)2, liberating approximately 1155 kJ/kg Calcium Oxide.

10.2 Chemical stability

Stable at normal ambient temperatures (minus 40 ºC to + 40 ºC) and pressures under dry conditions.

10.3 Possibility of hazardous reactions

None known.

10.4 Conditions to avoid

Minimise exposure to air and moisture to avoid degradation.

10.5 Incompatible materials

Must not be used for the treatment of gas streams other than those specified by the manufacturer. Avoid contact with water and acids. Storage in aluminium or brass containers in the presence of moisture will liberate Hydrogen.

10.6 Hazardous decomposition products

No known hazardous decomposition products.

Further information: Calcium Oxide absorbs moisture and Carbon Dioxide from air to form Calcium Carbonate, which is non-hazardous.

SECTION 11. TOXICOLOGICAL INFORMATION

Unless noted otherwise, the data provided in this section relates to the individual component substances of the mixture and are given in support of the classification and labelling information provided in Section 2.

11.1 Information on toxicological effects

Acute toxicity:

Nickel (II) Oxide
Based on available data, the classification criteria are not met.
Calcium Oxide
Oral LD_{50} > 2000 mg/kg (OECD 425, rat)
Dermal LD_{50} > 25000 mg/kg (Calcium Hydroxide, OECD 402, rabbit) by read across these results are also applicable to Calcium Oxide, since in contact with moisture Calcium Hydroxide is formed.
Based on the available data, Calcium Oxide is not acutely toxic.

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Irritation:	**Nickel (II) Oxide** Based on available data, the classification criteria are not met. **Calcium Oxide** Skin - human - severe skin irritation. Based on experimental results, Calcium Oxide and the mixture are classified as Category 2 Skin irritation, H315. Eyes (in vivo, rabbit) - risk of serious damage to eyes. Based on experimental results, Calcium Oxide and the mixture are classified as Category 1 Serious eye damage/eye irritation, H318.
Corrosivity:	**Nickel (II) Oxide** No data available. **Calcium Oxide** No data available.
Sensitisation:	**Nickel (II) Oxide** Maximization Test - rabbit - OECD Test Guideline 406 - may cause sensitization by skin contact. Based on available data, Nickel Oxide and the mixture are classified as Category 1 Skin sensitization, H317. **Calcium Oxide** Calcium Oxide is considered not to be a skin sensitizer, based on the nature of the effect (pH shift) and the essential requirement of Calcium for human nutrition. Based on available data, the classification criteria are not met.
Repeat dose toxicity:	**Nickel (II) Oxide** Not applicable. **Calcium Oxide** Not applicable.
Carcinogenicity:	**Nickel (II) Oxide** IARC: 1 - Group 1: Carcinogenic to humans. Based on available data, Nickel Oxide and the mixture are classified as Category 1A Carcinogenicity, Inhalation, H350i. **Calcium Oxide** Based on the available data, the classification criteria are not met.
Mutagenicity:	**Nickel (II) Oxide** Based on the available data, the classification criteria are not met. **Calcium Oxide** Based on the available data, the classification criteria are not met.
Specific Target Organ Toxicity (STOT) - single exposure	**Nickel (II) Oxide** Based on the available data, the classification criteria are not met. **Calcium Oxide** Inhalation - may cause respiratory irritation. Based on experimental results, Calcium Oxide and the mixture are classified as Category 3 STOT - single exposure, H335.

STOT - repeated exposure	**Nickel (II) Oxide** Inhalation - causes damage to organs through prolonged or repeated exposure. Based on experimental results, Nickel Oxide and the mixture are classified as Category 1 STOT - repeated exposure, H372 **Calcium Oxide** Based on the available data, the classification criteria are not met.
Aspiration hazard	**Nickel (II) Oxide** Based on the available data, the classification criteria are not met. **Calcium Oxide** Based on the available data, the classification criteria are not met.
Toxicity for reproduction:	**Nickel (II) Oxide** Based on the available data, the classification criteria are not met. **Calcium Oxide** Based on the available data, the classification criteria are not met.

Information on likely routes of exposure

No data available.

Symptoms related to the physical, chemical and toxicological characteristics

Eye Effects:	**Nickel (II) Oxide** May cause eye irritation. **Calcium Oxide** Causes eye burns.
Skin Effects:	**Nickel (II) Oxide** Toxic if absorbed through skin. May cause skin irritation. **Calcium Oxide** May be harmful if absorbed through skin. Causes skin irritation.
Ingestion/Oral Effects:	**Nickel (II) Oxide** Toxic if swallowed. **Calcium Oxide** May be harmful if swallowed.
Inhalation Effects:	**Nickel (II) Oxide** Toxic if inhaled. May cause respiratory tract irritation. **Calcium Oxide** May be harmful if inhaled. Causes respiratory tract irritation

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Nickel (II) Oxide

Dermatitis and shortness of breath (asthma).

Calcium Oxide

Cough, shortness of breath, headache, nausea, vomiting.

Other information

Nickel (II) Oxide

Registry of Toxic Effects of Chemical Substances, RTECS: QR8400000.

Calcium Oxide

Registry of Toxic Effects of Chemical Substances, RTECS: EW3100000.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

Nickel (II) Oxide	Freshwater algae, 127.3 mg/L EC_{50} > 72 h. Freshwater fish, 100 mg/L, 96 h. Water flea, 100 mg/L EC_{50} > 48 h.
Calcium Oxide	Toxicity to fish. LC_{50} - Cyprinus carpio (Carp) - 1,070 mg/L, 96 h

12.2 Persistence and degradability

Not applicable.

12.3 Bioaccumulative potential

Nickel (II) Oxide

Fucus vesiculosus - 21 d - 0.00001 mg/L.

Bioconcentration factor (BCF): 675.

Method: Tested according to Annex V of Directive 67/548/EEC.

Remarks: The product may be accumulated in organisms.

Calcium Oxide

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

PBT:	This mixture does not contain any substances that are assessed to be a PBT.
vPvB:	This mixture does not contain any substances that are assessed to be a vPvB.

12.6 Other adverse effects

No data available.

PRODUCT NAME : GRC Cartridge C150A

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product: Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Packaging: Dispose of as unused product

SECTION 14. TRANSPORT INFORMATION

14.1 UN number

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	UN1910	Not applicable

14.2 UN proper shipping name

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	Calcium Oxide Mixture	Not applicable

14.3 Transport hazard class

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	8	Not applicable

14.4 Packing group

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	III	Not applicable

14.5 Environmental hazards

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	Not applicable	Not applicable

PRODUCT NAME : GRC Cartridge C150A

14.6 Special precautions for user

ADR/RID	IMDG	IATA	United States DOT
None	None	None	None

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

Not applicable.

SECTION 15. REGULATORY INFORMATION

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

No additional provisions or regulations identified.

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this mixture by the supplier.

SECTION 16. OTHER INFORMATION

This SDS is compiled in accordance with ANSI Z400.1, Regulation (EC) No 1907/2006 (as amended by Regulation No 453/2010) concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

16.1 Full text of abbreviated statements and phrases

All relevant risk/safety phrases and hazard/precautionary statements are given in full in Section 2.2

16.2 NFPA / HMIS hazard codes

NFPA Hazard codes		HMIS Hazard codes		Rating System
Health	3	Health	3	0 = No Hazard
Flammability	0	Flammability	0	1 = Slight Hazard
Instability	1	Physical Hazard	1	2 = Moderate Hazard
		Personal Protection	E	3 = Serious Hazard
				4 = Severe Hazard

16.3 Sources of information for this data sheet

- The ECHA database on registered substances - http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances
- The ECHA classification and labelling inventory - http://echa.europa.eu/web/guest/regulations/clp/cl-inventory

- OECD - eChemPortal - http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- ESIS: European chemical Substances Information System - http://esis.jrc.ec.europa.eu/
- International Programme on Chemical Safety - INCHEM - http://www.inchem.org/

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

Classification according to Regulation (EC) Nr.1272/2008	Classification Procedure
Category 2 Skin irritation, H315	Calculation method
Category 1 Serious eye damage/eye irritation, H318	Calculation method
Category 3 STOT - single exposure, H335	Calculation method
Category 1A Carcinogenicity, inhalation, H350i	Calculation method
Category 1 Skin sensitization, H317	Calculation method
Category 1 STOT - repeated exposure	Calculation method

- Training advice - All training requirements on usage of this product should be addressed to the supplier using the contact details given in Section 1.

16.4 Glossary

ACGIH - American Conference of Governmental Industrial Hygienists; **ADN** - European agreement concerning the international carriage of dangerous goods by inland waterways **ADR** - European Agreement concerning the International Carriage of Dangerous Goods by Road; **ATE** - Acute Toxicity Estimate**; CAS No.** - Chemical Abstracts Service number; **CEN** - European Committee for Standardization; **CVD** - Chemical vapour deposition; **EC No.** - EINECS and ELINCS Number (see also EINECS and ELINCS); **EC_{50}** - Median effective concentration; **ECHA** - European Chemicals Agency; **EINECS** - European Inventory of Existing Commercial Substances; **ELINCS** - European List of Notified Chemical Substances; **IATA** - International carriage of dangerous goods by air; **IMDG** - International carriage of dangerous goods by sea; **LC_{50}** - Median lethal concentration; **LD_{50}** - Median lethal dose; **NIOSH** - National Institute for Occupational Safety and Health (US); **OECD** - Organisation for Economic Co-operation and Development; **OEL** - Occupational exposure limit; **PBT** - Persistent, bioaccumulative, toxic chemical; **PEL** - Permissible exposure limit; **RID** - International carriage of dangerous goods by rail; **STEL** - Short term exposure limit, 15 minute reference period; **STOT** - Specific target organ toxicity; **TLV** - Threshold limit value; **TWA** - Time weighted average, 8 hour reference period; **vPvB** - Very persistent, very bioaccumulative chemical

PRODUCT NAME : GRC Cartridge C150A

16.5 Revisions:

April 2010 - Data Sheet updated to reflect the latest supplier safety information and the latest regulatory information.

June 2012 - Data Sheet updated to reflect the current regulatory information.

December 2013 - Data Sheet updated to conform to Regulation (EC) No 1907/2006 (as amended by Regulation No 453/2010) and GHS.

May 2014 - Global formatting updates.

January 2016 - Contact details updated. Revision date not changed to preserve 2-yearly SDS review date.

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