

SAFETY DATA SHEET (SDS)

PRODUCT NAME : GRC Cartridge C150T C250T C250T/A

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

1.1 Product identifier

Product name: Gas Reactor Column (GRC) Cartridge
Types C150T, C250T and C250TA

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

Edwards, Innovation Drive, Burgess Hill, West Sussex,
RH15 9TW, United Kingdom

General enquiries

Tel: +44 (0)8459 212223
Email: info@edwardsvacuum.com

US contact details

Edwards, 6416 Inducon Drive West, Sanborn,
New York, 14132, USA

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).
Acute aquatic toxicity, Category 1 (applies to C150T only).
Chronic aquatic toxicity, Category 1 (applies to C150T only).
Chronic aquatic toxicity, Category 2 (applies to C250T and C250TA only).

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Classification according to
Directive 1999/45/EC:

Irritating to respiratory system and skin. Risk of serious damage to eyes.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment (applies to C150T only).
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment (applies to C250T and C250TA only).

2.2 Label elements

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

Hazard pictograms:



Signal words:

Danger

Hazard statements:

H315 - Causes skin irritation.
H318 - Causes serious eye damage.
H335 - May cause respiratory irritation.
H400 (C150T only) - Very toxic to aquatic life.
H410 (C150T only) - Very toxic to aquatic life with long lasting effects.
H411 (C250T and C250TA only) - Toxic to aquatic life with long lasting effects.

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.
P273 - Avoid release to the environment.
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-phrases(s):

R37/38 - Irritating to respiratory system and skin.
R41 - Risk of serious damage to eyes.
R51/53 (C150T only) - Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.
R52/53 (C205T and C250TA only) - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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S-phrases):

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S39 - Wear eye/face protection.

S60 - This material and its container must be disposed of as hazardous waste.

S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.

2.3 Other hazards

PBT criteria: None.

vPvB criteria: None.

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)
Calcium Oxide	1305-78-8	215-138-9	60-84	Irritant; Xi, R37/38, R41	Skin irritation 2, H315 Eye damage 1, H318 Organ toxicity 3, H335
Copper (II) Oxide	1317-38-0	215-269-1	1-4	Harmful; Xn, R22 Very toxic to aquatic organisms; R50/53	Acute aquatic toxicity 1, H400 Chronic aquatic toxicity 1, H410
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.					
Sodium Chloride	7647-14-5	231-598-3	0-3	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	13-30	Not applicable	Not applicable
Manganese (IV) Oxide	1313-13-9	215-202-6	1-5	Not applicable	Not applicable

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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.

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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 material 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.

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.

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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
Manganese (IV) Oxide	0.2 mg m ⁻³ - 8 hr TWA	5.0 mg m ⁻³ - 8 hr TWA (as Mn)	0.5 mg m ⁻³ - 8 hr TWA
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 (total dust) 4.0 mg m ⁻³ - 8 hr TWA (respirable fraction)

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	
Manganese (IV) Oxide	1.0 mg m ⁻³ - 8 hr TWA	
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	
Manganese (IV) 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		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	0.2 mg m ⁻³ - 8 hr TWA	
Silicon	10.0 mg m ⁻³ - 8 hr TWA	
Canada		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	Occupational Health and Safety Code - OEL
Manganese (IV) 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		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	0.15 mg m ⁻³ - 8 hr TWA	
Silicon	No data available	
Czech Republic		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA 4.0 mg m ⁻³ - STEL	No data available
Manganese (IV) Oxide	1.0 mg m ⁻³ - 8 hr TWA 2.0 mg m ⁻³ - STEL	
Silicon	No data available	
Denmark		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	0.2 mg m ⁻³ - 8 hr TWA	
Silicon	10.0 mg m ⁻³ - 8 hr TWA	
Finland		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	0.1 mg m ⁻³ - 8 hr TWA	
Silicon	No data available	
France		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	No data available	
Silicon	10.0 mg m ⁻³ - 8 hr TWA	

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Country/Ingredient	Exposure Limit	Basis
Germany		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	0.2 mg m ⁻³ - 8 hr TWA (inhalable dust) 0.02 mg m ⁻³ - 8 hr TWA (respirable dust)	
Silicon	No data available	
India		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	Factories Act, 1948 Section 41F. Permissible limits of exposure of chemical and toxic substances
Manganese (IV) Oxide	No data available	
Silicon	No data available	
Ireland		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	List of Chemical Agents and Occupational Exposure Limit Values - Schedule 1
Manganese (IV) Oxide	0.2 mg m ⁻³ - 8 hr TWA	
Silicon	10.0 mg m ⁻³ - 8 hr TWA (inhalable dust) 4.0 mg m ⁻³ - 8 hr TWA (respirable dust)	
Israel		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	No data available	
Silicon	No data available	
Italy		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	No data available	
Silicon	No data available	
Japan		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	No data available	
Silicon	No data available	
Malaysia		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	No data available	
Silicon	No data available	

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Country/Ingredient	Exposure Limit	Basis
Netherlands		
Calcium Oxide	No data available	No public limit values set.
Manganese (IV) Oxide	No data available	
Silicon	No data available	
Norway		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	0.1 mg m ⁻³ - 8 hr TWA	
Silicon	10.0 mg m ⁻³ - 8 hr TWA	
Portugal		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	0.2 mg m ⁻³ - 8 hr TWA	
Silicon	No data available	
Russian Federation		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	No data available	
Silicon	No data available	
Saudi Arabia		
Calcium Oxide	No data available	No data available
Manganese (IV) Oxide	No data available	
Silicon	No data available	
Singapore		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	Workplace Safety & Health Regulations - PEL
Manganese (IV) Oxide	1.0 mg m ⁻³ - 8 hr TWA	
Silicon	10.0 mg m ⁻³ - 8 hr TWA	
South Korea		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	1.0 mg m ⁻³ - 8 hr TWA	
Silicon	No data available	
Spain		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	0.2 mg m ⁻³ - 8 hr TWA	
Silicon	No data available	

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Country/Ingredient	Exposure Limit	Basis
Sweden		
Calcium Oxide	1.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	0.1 mg m ⁻³ - 8 hr TWA	
Silicon	No data available	
Switzerland		
Calcium Oxide	2.0 mg m ⁻³ - 8 hr TWA	No data available
Manganese (IV) Oxide	0.5 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).

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Hygiene Measures: As specified in 'Individual Protective 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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

The information presented below is for Calcium Oxide only.

Appearance	White granules	Melting point / freezing point	Melting point range: 2,572/4662	°C / °F
Odour	None	Initial boiling point and boiling range	2,800/5072 literature value	°C / °F
Odour threshold	Not applicable	Flash point	Not applicable	°C / °F
pH	12.5 - 12.8 at 1.65g/l at 25 °C	Upper/lower flammability or explosive limits	Not applicable	°C / °F
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 °C reacts to form Ca(OH) ₂	Relative density	3.3 at 25 °C	g/cm ³
Partition coefficient: n-octanol/water	No data available	Auto-ignition temperature	No data available	°C / °F
Explosive properties	Not applicable	Decomposition temperature	No data available	°C / °F
Oxidising properties	No data available	Viscosity	Not applicable	cSt

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The information presented below is for Copper (II) Oxide / Manganese (IV) Oxide only.

Appearance	Black granules	Melting point / freezing point	No data available	°C / °F
Odour	None	Initial boiling point and boiling range	No data available	°C / °F
Odour threshold	Not applicable	Flash point	Not applicable	°C / °F
pH	No data available	Upper/lower flammability or explosive limits	Not applicable	°C / °F
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)	Slight	Relative density	2.0 to 3.0	g/cm ³
Partition coefficient: n-octanol/water	No data available	Auto-ignition temperature	No data available	°C / °F
Explosive properties	No data available	Decomposition temperature	No data available	°C / °F
Oxidising properties	Strongly oxidising substance	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 °C to + 40 °C) 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.

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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 relate to 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:

Copper (II) Oxide

Oral LD₅₀ 470 mg/kg (OECD 425, rat)

Based on determination of the ATE, the mixture is not acutely toxic.

Calcium Oxide

Oral LD₅₀ > 2000 mg/kg (OECD 425, rat)

Dermal LD₅₀ > 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.

Irritation:

Copper (II) Oxide

No data available.

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:

Copper (II) Oxide

No data available.

Calcium Oxide

No data available.

Sensitisation:

Copper (II) Oxide

No data available.

Calcium Oxide

Calcium Oxide is considered not to be a skin sensitiser, 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:

Copper (II) Oxide

Not applicable.

Calcium Oxide

Not applicable.

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Carcinogenicity:	Copper (II) Oxide Based on available data, the classification criteria are not met. Calcium Oxide Based on available data, the classification criteria are not met.
Mutagenicity:	Copper (II) Oxide No data available. Calcium Oxide Based on available data, the classification criteria are not met.
Specific Target Organ Toxicity (STOT) - single exposure	Copper (II) Oxide No data available 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	Copper (II) Oxide Based on available data, the classification criteria are not met. Calcium Oxide Based on available data, the classification criteria are not met.
Aspiration hazard	Copper (II) oxide No data available. Calcium oxide Based on available data, the classification criteria are not met.
Toxicity for reproduction:	Copper (II) Oxide No data available. Calcium Oxide Based on 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:	Copper (II) Oxide May cause eye irritation. Calcium Oxide Causes eye burns.
Skin Effects:	Copper (II) Oxide May be harmful if absorbed through skin. May cause skin irritation. Calcium Oxide May be harmful if absorbed through skin. Causes skin irritation.
Ingestion/Oral Effects:	Copper (II) Oxide Harmful if swallowed. Calcium Oxide May be harmful if swallowed.

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Inhalation Effects: **Copper (II) Oxide**
 May be harmful 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

Copper (II) Oxide

Capillary damage, headache, cold sweat, weak pulse, and kidney and liver damage, central nervous system excitation followed by depression, jaundice, convulsions, paralysis, and coma. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Calcium Oxide

Cough, shortness of breath, headache, nausea, vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Other information

Copper (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

Copper (II) Oxide Toxicity to fish. LC₅₀ - Oncorhynchus mykiss (rainbow trout) - 25.4 mg/L - 96 h
 Toxicity to daphnia and other aquatic invertebrates. EC₅₀ - Daphnia magna (water flea) - 0.011 to 0.039 mg/L - 48 h.

Calcium Oxide Toxicity to fish. LC₅₀ - Cyprinus carpio (Carp) - 1,070 mg/L, 96 h.

12.2 Persistence and degradability

Not applicable.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

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12.6 Other adverse effects

Copper (II) Oxide

Very toxic to aquatic life with long lasting effects. Based on experimental results the mixture is classified as Category 1 Acute aquatic toxicity, H400 and Category 1 Chronic aquatic toxicity, H410 (C150T only).

Toxic to aquatic life with long lasting effects. Based on experimental results the mixture is classified as Category 2 Chronic aquatic toxicity, H411 (C250T and C250TA only).

Calcium Oxide

No data available.

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	UN3363	UN1910	Not applicable

14.2 UN proper shipping name

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Dangerous Goods in Apparatus	Calcium Oxide Mixture	Not applicable

14.3 Transport hazard class

ADR/RID	IMDG	IATA	United States DOT
Not applicable	9	8	Not applicable

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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

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.

SAFETY DATA SHEET (SDS)

PRODUCT NAME : GRC Cartridge C150T C250T C250T/A

16.2 NFPA / HMIS hazard codes

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

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 1 Acute aquatic toxicity, H400 (C150T only)	Calculation method
Category 1 Chronic aquatic toxicity, H410 (C150T only)	Calculation method
Category 2 Chronic aquatic toxicity, H411 (C250T and C250TA only)	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.

SAFETY DATA SHEET (SDS)

PRODUCT NAME : GRC Cartridge C150T C250T C250T/A

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; **CLP** - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; **CVD** - Chemical vapour deposition; **EC No.** - EINECS and ELINCS Number (see also EINECS and ELINCS); **EC₅₀** - 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; **LC₅₀** - Median lethal concentration; **LD₅₀** - Median lethal dose; **MARPOL** - International Convention for the Prevention of Pollution from Ships; **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

16.5 Revisions:

December 2013 - Initial release conforming 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.

Although the information and recommendations in this data sheet are to the best of our knowledge correct, it is recommended that you make your own determination of the material's suitability for your purpose before you use it. The information contained in this data sheet has been reproduced from the manufacturers data; accuracy of this information is the responsibility of the manufacturer. It should not, therefore, be construed as guaranteeing any specific property of the product.