

A Safety Data Sheet is not legally required for this product under the Workplace Hazardous Materials Information System (WHMIS). The following information is provided as a courtesy service to our customers.

SECTION 1: IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING**1.1 Product identifier**

Trade name: **SCALEGUARD® II PLUS**
Registration number: None
Synonym(s): Release-Controlled, Infused Ceramic Proppant; Semi-Crystalline Alumina Silicate; Sintered Kaolinite
Preparation/Revision date: 11 January 2017

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

Identified uses: Proppant for oil and natural gas well hydraulic fracturing and scale inhibition
Uses advised against: None known

1.3 Details of the supplier of the safety data sheet**Manufacturer / Supplier**

Company name: CARBO Ceramics Inc.
Address: 575 N. Dairy Ashford Road, Suite 300
Houston, Texas 77079, USA
Customer service: +1-337-367-6151

1.4 Emergency telephone number

For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night
Within USA and Canada: 1-800-424-9300

SECTION 2: HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture**

This product is an article that contains a chemical additive intended for time-release after delivery of the proppant into the well. Human and environmental exposure to the chemical additive is not anticipated under normal handling and storage conditions. The following information is provided as a courtesy in case of incidental exposure. This article has been assessed and/or tested for its physical, health and environmental hazards and the following classifications apply.

Classification according to WHMIS (Canada)

Classification: Not controlled

SECTION 2: HAZARDS IDENTIFICATION (CONT'D)**2.2 Label elements**

Contains:	None
Hazard pictogram:	None
Signal word:	None
Hazard statement:	None
Precautionary statements:	
- Prevention:	None
- Response:	None
- Storage:	None
- Disposal:	None
Supplemental label information:	None

2.3 Other hazards None

Hazard summary

Physical hazards:	Not classified for physical hazards.
Health hazards:	While the use of this product as intended generally does not create respirable dusts, small amounts may form from transport or conveyance. Prolonged inhalation of insoluble, respirable (less than 10 micron) dusts can lead to pulmonary damage. Use standard hygienic practices to minimize exposure to dusts that may form. While use of this product as intended does not result in exposure to chemical additives, exposure may cause irritation to the eyes and skin, and respiratory irritation. Ingestion may cause abdominal pain, vomiting, nausea and diarrhea.
Environmental hazards:	Not classified for hazards to the environment.
Main symptoms:	Exposure to dust may cause irritation of eyes, nose, throat and mucous membranes. Prolonged contact with skin may cause irritation. Exposure to the chemical additive may cause irritation to the eyes, skin, and respiratory tract. Ingestion may cause abdominal pain, vomiting, nausea and diarrhea. Use of the product as intended does not result in exposure to dust or chemical additives.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Mixture

Chemical Name	Percent	CAS No.	Notes
Substrate			
Ceramic materials and wares, chemicals	85-90	66402-68-4	-
Semi-permeable coating	0-5	Trade Secret	-
Chemical Additive			
Confidential scale inhibitor	3-10	Trade Secret	-
Confidential buffer 1	0-2	Trade Secret	-
Confidential buffer 2	< 0.2	Trade Secret	-

Composition comments: All concentrations are in percent by weight unless ingredients are a gas. Gas concentrations are in percent by volume.

SECTION 4: FIRST AID MEASURES

General Information

Show this Safety Data Sheet to the medical professional in attendance. Exposure is not anticipated with use of this product as intended. If symptoms occur, follow first aid measures as appropriate.

4.1 Description of first aid measures

Inhalation:	Remove to fresh air. Get medical attention if irritation or symptoms persist.
Skin contact:	Wash with soap and water. Get medical attention if irritation develops or persists.
Eye contact:	Rinse immediately with plenty of water, including under the eyelids, for at least 15 minutes. Get medical attention if irritation or symptoms persist.
Ingestion:	Rinse mouth. Do not induce vomiting. Get medical attention.
Notes to Physician:	None specified

4.2 Most important symptoms and effects, both acute and delayed

Exposure to dust may cause irritation of eyes, nose, throat and mucous membranes. Prolonged contact with skin may cause irritation. Exposure to the chemical additive may cause irritation to the eyes, skin, and respiratory tract. Ingestion may cause abdominal pain, vomiting, nausea and diarrhea. Use of the product as intended does not result in exposure to dust or chemical additives.

SECTION 4: FIRST AID MEASURES, (CONT'D)

4.3 Indication of any immediate medical attention and special treatment needed Provide general supportive measures and treat symptoms as needed.

SECTION 5: FIRE FIGHTING MEASURES

General fire hazards Product may ignite if exposed to open flame or other ignition sources.

5.1 Extinguishing Media

Suitable extinguishing media: CO₂, dry chemical, foam or water
Unsuitable extinguishing media: Not applicable

5.2 Special hazards arising from the substance or mixture Not applicable

5.3 Advice for firefighters

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus
Special firefighting procedures: Not applicable
Special remarks on fire hazards: None

SECTION 6: ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel: Avoid dust formation. Avoid exposure to chemical additives. Wear suitable protective clothing. Avoid contact with skin and eyes.
For emergency responders: Use personal protection recommended in Section 8 of the SDS.

6.2 Environmental Precautions None known

6.3 Methods and materials for containing and cleaning up Sweep up spilled substance and remove to safe place. Pick up and arrange for disposal without creating dust. Spilled material can reduce traction and may present a slip hazard. Collect and dispose of spillage as indicated in Section 13.

SECTION 6: ACCIDENTAL RELEASE MEASURES (CONT'D)

6.4 Reference to other Sections For personal protection, see Section 8.
For waste disposal, see Section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling Avoid dust formation. Avoid breathing dust. Avoid exposure to chemical additives. Observe good industrial hygiene practices. Spilled material can reduce traction and may present a slip hazard.

7.2 Conditions for safe storage, including any incompatibilities Keep container tightly closed. Store in accordance with local, regional, national and international regulations.

7.3 Specific end use(s) Industrial use – oil & gas well stimulation.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Canada. Occupational Exposure Limits

Component	CAS No.	Type	Value	Form
Ceramic materials and wares, chemicals	66402-68-4	N/A	N/A	N/A
Semi-permeable coating	Trade Secret	N/A	N/A	N/A
Confidential scale inhibitor	Trade Secret	N/A	N/A	N/A
Confidential buffer 1	Trade Secret	N/A	N/A	N/A
Confidential buffer 2	Trade Secret	N/A	N/A	N/A

Consult local authorities for acceptable exposure limits

8.2 Exposure Controls

Appropriate engineering controls: Observe occupational exposure limits and prevent generation of dusts.

Individual Protective Measures

General Information: Personal protective equipment should be chosen according to applicable standards and in consultation with the supplier of the personal protective equipment. Spilled material can reduce traction and may present a slip hazard.

Eye/face protection: Wear safety glasses with side shields or goggles. Avoid wearing contact lenses while handling.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION (CONT'D)

Skin protection:

- Hand protection: Wear protective gloves.
- Other: Minimize skin contact.

Respiratory protection:

In case of inadequate ventilation or risk of inhalation of dust, use a suitable air purifying respirator with particle filter or dust mask (Type P2).

Thermal hazards:

Not applicable

Hygiene measures

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental exposure controls

Environmental manager must be informed of all major releases.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Form	Solid spheres	Explosive properties	Not applicable
Color	Pale green to pale yellow	Explosive limit	Not applicable
Odor	Odorless	Vapor pressure	Not applicable
Odor threshold	Not applicable	Vapor density	Not applicable
pH	Not applicable	Evaporation rate	Not applicable
Melting/freezing point	Not applicable (Cross-linked resin coating) 4,000°F / 2,204°C (Estimated - Substrate)	Relative density	2.5-2.8 (water = 1)
Boiling point, initial boiling point and boiling range	Not applicable	Partition coefficient (n-octanol/water)	No data available
Flash point	Not applicable	Solubility (water)	Insoluble in water
Auto-ignition temperature	Not applicable	Decomposition temperature	No data available
Flammability (solid, gas)	Not applicable	Bulk density	90-105 lb/ft ³ (1,442-1,682 kg/m ³)
Flammability limit-lower%	Not applicable	Viscosity	Not applicable
Flammability limit-upper%	Not applicable	VOC (weight %)	0 %
Oxidizing properties	Not applicable	Percent volatile	Not applicable

9.2 Other Information

No relevant additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
10.2 Chemical stability	Material is stable under normal conditions.
10.3 Possibility of hazardous reactions	Hazardous polymerization does not occur under normal conditions.
10.4 Conditions to avoid	Excessive heat
10.5 Incompatible materials	Strong oxidizers. Strong acids. Strong bases.
10.6 Hazardous decompositions products	Thermal decomposition may produce oxides of carbon, oxides of nitrogen, oxides of phosphorus, ammonia, aldehydes or other materials.

SECTION 11: TOXICOLOGICAL INFORMATION**General information on likely routes of exposure**

Ingestion:	May cause discomfort if swallowed. The chemical additive is harmful if swallowed.
Inhalation:	Inhalation of dust or chemical additives may cause respiratory irritation. Use of this product as intended does not result in exposure to dust or chemical additives.
Skin contact:	Dust and chemical additives may irritate skin. Use of this product as intended does not result in exposure to dust or chemical additives.
Eye contact:	Dust and chemical additives may irritate eyes. Use of this product as intended does not result in exposure to dust or chemical additives.
Symptoms:	Exposure to dust may cause irritation of eyes, nose, throat and mucous membranes. Prolonged contact with skin may cause irritation. Exposure to the chemical additive may cause irritation to the eyes, skin, and respiratory tract. Ingestion may cause abdominal pain, vomiting, nausea and diarrhea. Use of the product as intended does not result in exposure to dust or chemical additives.

SECTION 11: TOXICOLOGICAL INFORMATION (CONT'D)

11.1 Information on toxicological effects

Acute Toxicity: No data were identified for the product as a whole. Data are for constituents:

Product / ingredient name	Result	Species	Dose	Exposure
Ceramic materials and wares, chemicals	No data	N/A	N/A	N/A
Semi-permeable coating	No data	N/A	N/A	N/A
Confidential scale inhibitor*	LD ₅₀	Rat	>5,838 mg/kg	Oral; Dermal
Confidential buffer 1	LD ₅₀	Rat	2,000-5,000 mg/kg	Oral
	LD ₅₀	Rat	> 10,000 mg/kg	Dermal
Confidential buffer 2*	LD ₅₀	Rat	> 2,000 mg/kg	Oral; Dermal
	LC ₅₀	Rat	> 0.83 mg/L	Inhalation

* Based on data for a similar substance.

Serious Eye Damage/Irritation: No data were identified for this product as a whole. Confidential buffer 1 caused slight to moderate eye irritation in rabbits in both undiluted samples and at 10% in water. Confidential buffer 2 is expected to cause serious eye damage, with potential tissue damage, based on data for a similar substance.

Skin corrosion/Irritation: No data were identified for this product as a whole. Confidential buffer 1 was not irritating to the skin of rabbits. Confidential buffer 2 is expected to cause moderate skin irritation based on data for a similar substance.

Respiratory/Skin Sensitization: No data were identified for this product as a whole. Confidential scale inhibitor and confidential buffer 2 are not expected to be skin sensitizers based on data for similar substances. Confidential buffer 1 is not regarded as a sensitizer.

Germ Cell Mutagenicity: No data were identified for this product as a whole. Confidential scale inhibitor is not expected to cause mutagenic effects based on data for similar substances. Confidential buffer 2 is not regarded as mutagenic.

Carcinogenicity: No data were identified for this product as a whole. Confidential scale inhibitor is not expected to be carcinogenic based on data for similar substances. Confidential buffer 1 did not cause carcinogenic effects when tested in rats. None of the components of this product are listed as a carcinogen by IARC, NTP or OSHA.

Reproductive Toxicity: No data were identified for this product as a whole. Confidential scale inhibitor and confidential buffer 2 are not expected to affect fertility based on data for similar substances. Confidential buffer 1 is not known to be a reproductive toxicant.

Developmental Effects: No data were identified for this product as a whole. Confidential scale inhibitor and confidential buffer 2 are not expected to cause developmental effects based on data for similar substances. Confidential buffer 1 is not known to be a teratogen.

SECTION 11: TOXICOLOGICAL INFORMATION (CONT'D)

STOT – Single Exposure: No data were identified for this product as a whole. Confidential buffer 1 and confidential buffer 2 may cause disorder and damage to the respiratory system.

STOT – Repeated Exposure: No data were identified for this product as a whole. While the use of this product as intended generally does not create respirable dusts, small amounts may form from transport or conveyance. Prolonged inhalation of insoluble, respirable (less than 10 micron) dusts can lead to pulmonary damage. Use standard hygienic practices to minimize exposure to dusts that may form.

Aspiration Hazard: Not relevant based on physical form of the product.

Conclusion/Summary This product is not expected to produce toxic effects.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity / Aquatic Ecotoxicity No data were identified for this product as a whole. Data are for constituents

Product / ingredient name	Result	Species	Dose	Exposure
Ceramic materials and wares, chemicals	N/A	N/A	N/A	N/A
Semi-permeable coating	N/A	N/A	N/A	N/A
Confidential scale inhibitor*	LC ₅₀	<i>Oncorhynchus mykiss</i>	216 mg/L	96 hour
	NOEC	<i>Oncorhynchus mykiss</i>	25.6 mg/L	60 day
Confidential buffer 1	LC ₅₀	freshwater fish (varies)	9,675 mg/L	96 hour
	EC ₅₀	<i>Tubifex tubifex</i>	1,250 mg/L	24 hour
Confidential buffer 2*	LC ₅₀	<i>Oncorhynchus mykiss</i>	> 100 mg/L	96 hour
	EC ₅₀	<i>Daphnia magna</i>	> 100 mg/L	48 hour
	EC ₅₀	<i>Desmodesmus subspicatus</i>	> 100 mg/L	72 hour
	NOEC	N/A	> 1,000 mg/L	3 hour

* Based on data for a similar substance.

12.2 Persistence and degradability Product is not biodegradable with low solubility in water and is not expected to decompose in the environment. Confidential scale inhibitor is not biodegradable. Confidential buffer 1 is readily biodegradable.

12.3 Bioaccumulative potential Product is not biodegradable with low solubility in water and is not expected to accumulate in the environment. Confidential scale inhibitor is not bioaccumulative.

12.4 Mobility No data available

SECTION 12: ECOLOGICAL INFORMATION (CONT'D)

12.5 Results of PBT and vPvB assessment	Not a PBT or vPvB material
12.6 Other adverse effects	This product is not classified as hazardous to the environment.
Conclusion/Summary	Ecotoxicity data from comparable products indicates that this product is non-toxic in the environment.

SECTION 13: DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods**

Residual waste:	Dispose of in accordance with all applicable regulations.
Contaminated packaging:	Empty containers should be taken to an approved waste handling site for recycling or disposal.
Disposal methods/information:	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local, regional, national, international regulations.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14: TRANSPORT INFORMATION

14.1 UN Number	Not applicable, not regulated as hazardous for transport.
14.2 UN proper shipping name	Not applicable, not regulated as hazardous for transport.
14.3 Transport hazard class(es)	Not applicable, not regulated as hazardous for transport.
14.4 Packing group	Not applicable, not regulated as hazardous for transport.
14.5 Environmental hazards	Not applicable, not regulated as hazardous for transport.
14.6 Special precautions for user	Not applicable, not regulated as hazardous for transport.

SECTION 14: TRANSPORT INFORMATION (CONT'D)**14.7 Transport in bulk according to Annex II MARPOL73/78 and the IBC Code**

Not applicable, not regulated as hazardous for transport.

The transport regulation may vary based on the country of use. Check for the appropriate regulations in the country of transport or usage of this product.

SECTION 15: REGULATORY INFORMATION**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****Canadian Regulations**

WHMIS (Canada):	This product has been classified according to the hazard criteria of the CPR and the SDS contains all of the information required by the CPR.
WHMIS Ingredient Disclosure List (Canada):	Not listed
CEPA (DSL):	All components are listed or exempted.
CEPA (NPRI):	Not listed

Other Regulations None specified**SECTION 16: OTHER INFORMATION****Label Requirements** None**List of abbreviations**

CAS	Chemical Abstract Service
CEPA	Canadian Environmental Protection Act
DSL	Domestic Substances List (Canada)
EC50/90	Effective Concentration (median / 90 th percentile)
IARC	International Agency for Research on Cancer
LC50/90	Lethal Concentration (median / 90 th percentile)
NOEC	No Observed Effect Concentration
NPRI	National Pollutant Release Inventory (Canada)
NTP	National Toxicology Program (United States)
OSHA	Occupational Safety and Health Administration (United States)

SECTION 16: OTHER INFORMATION (CONT'D)**List of abbreviations, cont'd**

PBT	Persistent, Bioaccumulative and Toxic
vPvB	Very Persistent and Very Bioaccumulative
WHMIS	Workplace Hazardous Materials Information System (Canada)

References

ChemAdvisor List of Lists (LOLI)
IARC Monographs. Overall Evaluation of Carcinogenicity
IUCLID DATA Set
ECHA Dissemination Portal

Information on evaluation method leading to the classification of mixture

The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available. For details refer to Sections 9, 11 and 12.

Full test of any statements or R-phrases and H-phrases under Section 2 to 12

None

Training information

Follow training instructions when handling this material.

SDS Revisions

SDS prepared on 11 January 2017.

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.