

*A Safety Data Sheet is not legally required for this product under the OSHA Hazard Communication Standard (29 CFR 1910.1200). 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 – KSHD (Up to 15% Blend)**  
Registration number: NA  
Synonym(s): Release-Controlled, Infused Ceramic Proppant; Semi-Crystalline Alumina and/or Alumina Silicate  
Preparation/Revision date: 25 March 2015

**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 the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

Classification: Not classified

**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 corrosion or irritation to the eyes and skin.
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 corrosion or irritation to the eyes and skin. Use of the product as intended does not result in exposure to dust or chemical additives.

### SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

#### ARTICLE

#### 3.1 Mixture

Chemical Name	Percent	CAS No.	Notes
<b>Substrate</b>			
Ceramic materials and wares, chemicals	97-99	66402-68-4	-
Semi-permeable coating	< 1	Trade Secret	-
<b>Chemical Additive</b>			
Diethylenetriaminepenta(methylenephosphonic acid) (DTPMP)	< 1	15827-60-8	-
Sodium hydroxide	< 1	1310-73-2	#
Calcium chloride	< 1	10043-52-4	#

#: This substance has workplace exposure limit(s)

**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 corrosion or irritation to the eyes and skin. 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: CO<sub>2</sub>, 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.

**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

##### United States. 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
Diethylenetriaminepenta(methylenephosphonic acid) (DTPMP)	15827-60-8	N/A	N/A	N/A
Sodium hydroxide	1310-73-2	ACGIH TLV – Ceiling	2 mg/m <sup>3</sup>	N/A
		NIOSH REL – Ceiling	2 mg/m <sup>3</sup>	N/A
		NIOSH REL – IDLH	10 mg/m <sup>3</sup>	N/A
		PELs – TWA	2 mg/m <sup>3</sup>	N/A
Calcium chloride	10043-52-4	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

<b>Form</b>	Solid spheres	<b>Explosive properties</b>	Not applicable
<b>Color</b>	Pale green to pale yellow	<b>Explosive limit</b>	Not applicable
<b>Odor</b>	Odorless	<b>Vapor pressure</b>	Not applicable
<b>Odor threshold</b>	Not applicable	<b>Vapor density</b>	Not applicable
<b>pH</b>	Not applicable	<b>Evaporation rate</b>	Not applicable
<b>Melting/freezing point</b>	185-203°F / 85-95°C (Estimated – Coating) 4,000°F / 2,204°C (Estimated – Substrate)	<b>Relative density</b>	3.63 (water = 1)
<b>Boiling point, initial boiling point and boiling range</b>	Not applicable	<b>Partition coefficient (n-octanol/water)</b>	No data available
<b>Flash point</b>	Not applicable	<b>Solubility (water)</b>	Insoluble in water
<b>Auto-ignition temperature</b>	Not applicable	<b>Decomposition temperature</b>	No data available
<b>Flammability (solid, gas)</b>	Not applicable	<b>Bulk density</b>	133 lb/ft <sup>3</sup> (2,130 kg/m <sup>3</sup> )
<b>Flammability limit-lower%</b>	Not applicable	<b>Viscosity</b>	Not applicable
<b>Flammability limit-upper%</b>	Not applicable	<b>VOC (weight %)</b>	0 %
<b>Oxidizing properties</b>	Not applicable	<b>Percent volatile</b>	Not applicable

#### 9.2 Other Information

No relevant additional information available

**SECTION 10: STABILITY AND REACTIVITY**

<b>10.1 Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>10.2 Chemical stability</b>	Material is stable under normal conditions.
<b>10.3 Possibility of hazardous reactions</b>	Hazardous polymerization does not occur under normal conditions.
<b>10.4 Conditions to avoid</b>	Not specified
<b>10.5 Incompatible materials</b>	Strong oxidizers
<b>10.6 Hazardous decompositions products</b>	Thermal decomposition may produce oxides of carbon, oxides of nitrogen, 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 corrosion or irritation to the eyes and skin. 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
DTPMP	LD <sub>50</sub>	Rat	>5,000 mg/kg bw	Oral
	LD <sub>50</sub>	Rabbit	>5,000 mg/kg bw	Dermal
Sodium hydroxide	LD <sub>50</sub>	Rabbit	325 mg/kg bw	Oral
Calcium chloride	LD <sub>50</sub>	Rat	3,798 mg/kg (m), 4,179	Oral
	LD <sub>50</sub>	Rabbit	mg/kg (f) 5,000 mg/kg	Dermal

**Serious Eye Damage/Irritation:** No data were identified for this product as a whole. DTPMP, present in this product at less than 1%, was found to be corrosive to mildly irritating to the eyes of rabbits at high concentrations. Sodium hydroxide, present in this product at less than 1%, was non-irritating to the eyes of rabbits at concentrations of 0.2 to 1% and corrosive at concentrations as low as 1.2%. Calcium chloride, present in this product at less than 1%, is severely irritating to the eyes of rabbits.

**Skin corrosion/Irritation:** No data were identified for this product as a whole. DTPMP, present in this product at less than 1%, was found to be slightly irritating to the skin of rabbits when exposed at high concentrations. Sodium hydroxide, present in this product at less than 1%, was found to be irritating to the skin of humans at concentrations of 0.5-4.0% and was found to be corrosive to the skin of animals at concentrations exceeding 8%. Calcium chloride, present in this product at less than 1%, is non-irritating to slightly irritating to the skin.

**Respiratory/Skin Sensitization:** No data were identified for this product as a whole. None of the components of this product are known or anticipated to be sensitizers. DTPMP, present in this product at less than 1%, was found to be non-sensitizing to the skin of guinea pigs in a Buehler Test and a Guinea Pig Maximization Test.

**Germ Cell Mutagenicity:** No data were identified for this product as a whole. None of the components of this product are known or anticipated to be mutagenic. DTPMP, present in this product at less than 1%, is not considered to pose a genotoxic hazard. While evidence for mutagenic potential *in vitro* in mammalian cells is conflicting, DTPMP was negative *in vitro* in bacteria and in an HPRT locus test and *in vivo* in a chromosome aberration study. Sodium hydroxide, present in this product at less than 1%, indicated no evidence of mutagenic activity in both *in vitro* and *in vivo* genetic toxicity tests. Genetic toxicity of calcium chloride, present in this product at less than 1%, was negative in the bacterial mutation tests and the mammalian chromosome aberration test.



**SECTION 11: TOXICOLOGICAL INFORMATION (CONT'D)**

Carcinogenicity:	No data were identified for this product as a whole. No evidence of carcinogenicity was observed in chronic toxicity studies in DTPMP.
Reproductive Toxicity:	No data were identified for this product as a whole. In a one-generation reproductive toxicity study on DTPMP (present in this product at less than 1%) administered via the diet in rats, no clear treatment-related or statistically significant effects were seen. The reproductive NOAEL in this study was determined to be 294 mg/kg bw/day for parental males; 312 mg/kg bw/day for parental females and 100 mg/kg bw/day for fetotoxicity. Sodium hydroxide and calcium chloride, present in this product at less than 1% each, are not expected to be reproductive toxicants.
Developmental Effects:	No data were identified for this product as a whole. In a prenatal developmental toxicity screening study on DTPMP (sodium salt) in rats, the NOAEL for developmental toxicity was 2000 mg/kg bw/day.
STOT – Single Exposure:	No data were identified for this product.
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. Calcium chloride, present in this product at less than 1%, is not anticipated to be toxic. Calcium and chloride are both essential nutrients for humans and a daily intake of more than 1000 mg each of the ions is recommended.
Aspiration Hazard:	Not relevant based on physical form of the product.
<b>Conclusion/Summary</b>	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
DTPMP	EC <sub>50</sub>	<i>Chironomus tentans</i>	9,910 mg/L	48 h
	LC <sub>50</sub>	<i>Oncorhynchus mykiss</i>	180 - 252 mg/L	96 h
	NOEC	<i>Oncorhynchus mykiss</i>	25.6 mg/L	60 day
	EC <sub>0</sub>	<i>Photobacterium phosphoreum</i> (Bacteria)	>2500 mg/L	30 min
	ErC <sub>50</sub>	Algae (species not specified)	>10 mg/L	95 h
	EC <sub>50</sub>	<i>Selenastrum capricornutum</i> (Algae)	8.68 mg/L (biomass)	14 d
Sodium Hydroxide*	L(E)C <sub>50</sub>	Various aquatic organisms	33 - 189 mg/L	No data
Calcium Chloride	LC <sub>50</sub>	<i>Pimephales promelas</i>	4,630 mg/L	96 h
	EC <sub>50</sub>	<i>Daphnia magna</i>	1,062 mg/L	48 h
	EC <sub>50</sub>	<i>Selensatrum capricornutum</i>	2,900 mg/L	72 h

\* The hazard of NaOH for the environment is caused by the hydroxyl ion (pH effect). For this reason the effect of NaOH on the organisms depends on the buffer capacity of the aquatic or terrestrial ecosystem. Also the variation in acute toxicity for aquatic organisms can be explained for a significant extent by the variation in buffer capacity of the test medium.

### 12.2 Persistence and degradability

Product is not biodegradable with low solubility in water and is not expected to decompose in the environment. DTPMP, present in this product at less than 1%, is considered not readily biodegradable under standard conditions; however, there was some evidence of degradation by abiotic processes in natural waters and following acclimation or under conditions of low inorganic phosphate. Sodium hydroxide will rapidly dissolve and dissociate in water.

### 12.3 Bioaccumulative potential

Product is not biodegradable with low solubility in water and is not expected to accumulate in the environment. DTPMP, present in this product at less than 1%, is not expected to be bioaccumulative, based on its low Log Kow and read-across to related substances. Sodium hydroxide, present in this product at less than 1%, is not expected to bioconcentrate in organisms due to its high water solubility and rapid dissociation in water.

### 12.4 Mobility

No data available

### 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**

<b>14.1 UN Number</b>	Not applicable, not regulated as hazardous for transport.
<b>14.2 UN proper shipping name</b>	Not applicable, not regulated as hazardous for transport.
<b>14.3 Transport hazard class(es)</b>	Not applicable, not regulated as hazardous for transport.
<b>14.4 Packing group</b>	Not applicable, not regulated as hazardous for transport.
<b>14.5 Environmental hazards</b>	Not applicable, not regulated as hazardous for transport.
<b>14.6 Special precautions for user</b>	Not applicable, not regulated as hazardous for transport.
<b>14.7 Transport in bulk according to Annex II MARPOL73/78 and the IBC Code</b>	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**

**USA Federal Regulations**

29 CFR 1910.1200 Hazard Communication Standard (HCS): Not hazardous  
 TSCA - U.S. Inventory (TSCA 8b): Exempt/Compliant  
 SARA Title III – Section 302, Extremely Hazardous Substances (EHS): None  
 U.S. Clean Air Act (CAA): None  
 U.S. Clean Water Act (CWA): Sodium hydroxide (100 lb)  
 U.S. Chemical Facility Anti-Terrorism Standards (CFATS): None  
 CERCLA - Hazardous substances:

Components	Concentration	Section 304 CERCLA Hazardous Substance	CERCLA Reportable Quantity	Product Reportable Quantity
Sodium hydroxide	< 1%	-	1,000 lb	100,000 lb

**Release of CERCLA hazardous substances in excess of any reportable quantity threshold to the environment requires notification to the National Response Center (+1-800-424-8802 or +1-202-267-2675).**

SARA Title III – Section 302, Extremely Hazardous Substances (EHS): Not listed  
 SARA Title III – 311/312, Hazard Classes:

Fire / Flammability	No
Reactivity	No
Release of Pressure	No
Acute Health Hazard	No
Chronic Health Hazard	No

SARA 313 – Toxic Chemicals: None

**USA State Regulations:**

California Prop 65: Not listed  
 Massachusetts – Right to Know: Sodium hydroxide (1%)  
 New Jersey - Right to Know: Sodium hydroxide (1%)  
 Pennsylvania – Right to Know: Sodium hydroxide (1%)

**Other Regulations** None specified

**SECTION 16: OTHER INFORMATION****Label Requirements**

None

**List of abbreviations**

CAS	Chemical Abstract Service
EC50/90	Effective Concentration (median / 90 <sup>th</sup> percentile)
LC50/90	Lethal Concentration (median / 90 <sup>th</sup> percentile)
OSHA	Occupational Safety and Health Administration (United States)
PBT	Persistent, Bioaccumulative and Toxic
vPvB	Very Persistent and Very Bioaccumulative

**References**

ChemAdvisor List of Lists (LOLI)  
IARC Monographs. Overall Evaluation of Carcinogenicity  
IUCLID DATA Set  
Supplier Safety Data Sheet

**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 25 March 2015.

**Disclaimer**

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