MEDICAL SAFETY DATA SHEET / USA (Nr.07)
As amended by Commission (EU) Directive No. 2015/830

Date of issue: 14 February 2014
Revision date: 10. January 2018

Product name: Silica Bricks and bricks based on fused silica
Product group: DISIL, FUSIL
Quality class: DISS, DSSB, DSA, DU, DKN, DKD, DKS, DS 30, VZ, DOX,
DOLL, DOLL14, DOLL17, DOML14, DML17, DHKS, DHKD
KS96, KS98F, KS99
PD-SI96, PD-SI97LF, PD-SI97LL17, PD-SI95HBs, PD-SI95KN, PD-
SI95KD, PD-SI95KS, PD-SI97LL, PD-Si100NL

SECTION 1. SUBSTANCE/MIXTURE AND MANUFACTURER IDENTIFICATION

1.1. Product identifier:

Business name: Silica Bricks
CAS no: n/a (mixture)          EC (EINECS) no: n/a (mixture)
Index no: n/a (mixture)        REACH registration no: N/A for mixtures
Other names: None.

1.2. Designed applications of substance or mixture and non-recommended applications:

Designated industry – masonry lining of walls, vaults and other parts of thermal aggregates.

1.3. Detailed data of material safety data sheet supplier:

Manufacturer: P-D Refractories CZ a.s.
Address: Nádražní 218, 679 63 Velké Opatovice
Phone: +420 516 493 111, Fax: +420 516 477 338
Email address of competent person responsible for material safety data sheet:
Milan.mazura@pd-group.com

1.4. Emergency phone for CZ:

Toxicological information centre: +420 224919293, 224915402
Na Bojišti 1, 128 08 PRAGUE 2

1.4. Emergency phone for USA:

General Phone: 412-375-6600
CHEMTREC 24 HOUR EMERGENCY # 1-800-424-9300

SECTION 2. HAZARD IDENTIFICATION

2.1 Classification of substance or mixture:
The product is not classified as hazardous pursuant to Regulation of the European Parliament and of the
Council (EC) no 1272/2008 CLP.

2.2. Identification elements:
The product is not subject to compulsory identification.

2.3. Other hazards:

This product contains various forms of crystalline silica. Finished GREFCO refractory bricks do not
present any unusual health or safety hazards. However, if this product is used in such a way as to
generate airborne particulate, health hazards can arise from chronic exposure to the airborne
particulate. Also, these refractory bricks may be contaminated with other compounds during their
use in industrial applications. End users of this product are responsible for determining additional
hazards that may arise after this product is used in their specific industrial application. Other More detailed
information is provided in section 4.2

SECTION 3. COMPOSITION/COMPONENT INFORMATION

3.1. Substances:
Not to be completed.

3.2. Mixtures:
Moulded dense refractory material based on silicates with SiO2 content over 93%, content of silicon dioxide –
silica below 3% (CAS: 14808-60-7, EC:238-878-4) and 50–70% of cristobalite (CAS: 14464-46-1, EC: 238-
455-4) and 30–50% of tridymite.

Substances dangerous for health or the environment:
The product does not contain substances classified as dangerous in the sense of Act no 350/2011 Coll., or in
the sense of Dangerous Preparation Directive (1999/45/EC) or Regulation of the European Parliament and of
the Council (EC) no. 1272/2008 CLP.
Note: The mentioned chromic oxide contains chromium in oxidation level III.

Substances with workplace exposure limits:

Does not contain any in the solid state, otherwise see data in 8.1.
Persistent, bio-accumulative and toxic, highly persistent and highly bio-accumulative substances:
The product does not contain PBT and vPvB type substances.
SECTION 4. FIRST AID INSTRUCTIONS

4.1 First aid description:

4.1.1 First aid instructions:

General instructions: Dust resulting from cutting, grinding, breaking etc. mainly consists of a mixture of aluminium-silicates. Exposure to dust particles may cause irritation of eyes and upper respiratory tract. Dust particles may contain a small amount of crystalline silicon dioxide.

Immediate medical attention is not necessary.

Inhalation: Move the exposed person to the fresh air. Rinse the oral cavity with water and clear the nose to remove the inhaled dust.

Skin contact: First aid not needed, observe routine personal hygiene practice.

Eye contact: Wash with plenty of lukewarm water. After rinsing use a suitable eye lotion. Wash the eye surroundings with water too. In the case of eye injury seek medical attention.

Swallowing: Never evoke vomiting in unconscious person! Do not serve drinks to unconscious person! Rinse the mouth with water carefully, drink a couple of glasses of water.

4.1.2 Additional data:

a) Immediate medical attention is recommended in the case of swallowing.

b) In the case of inhalation moving the exposed person to fresh air is recommended.

c) Remove contaminated parts of clothing.

d) Recommended personal protective means to persons providing first aid: See section 8

4.2 Major acute and delayed symptoms and effects:

Respiratory tract irritation.
Exposed eye irritation.
Temporary irritation of the digestive tract after swallowing the dust.

4.2.1 Symptoms of exposure to crystalline silica:

a) Inhalation: Silicosis: Chronic exposure to respirable crystalline silica can cause silicosis, a fibrous scarring of the lungs. Silicosis may be progressive and may lead to disability and death. Lung Cancer: Crystalline silica in ha led from occupational sources is classified as carcinogenic to humans by IARC and NTP. Tuberculosis: Silicosis increases the risk of tuberculosis. Autoimmune Disease: There is evidence that exposure to crystalline silica (without silicosis) or the disease silicosis may be associated with the increased incidence of several autoimmune disorders including scleroderma, systematic lupus, and rheumatoid arthritis. Kidney Disease: There is evidence that exposure to crystalline silica (without silicosis) or that the disease silicosis is associated with the increased risk of kidney diseases, including end stage renal disease. Non-malignant Respiratory Disease: There is evidence that exposure to crystalline silica is associated with an increased incidence of chronic bronchitis and emphysema.

b) Eye Contact: Crystalline silica may cause abrasion of the cornea.

c) Skin Contact: May cause abrasion to skin.

d) Ingestion: Unlikely route of occupational exposure. No known effects

e) Acute Effects: Very high exposures to crystalline silica over periods as short as a few months can result in acute silicosis. Symptoms include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal

f) Chronic Effects: The adverse health effects listed above, silicosis, lung cancer, kidney diseases, tuberculosis, and non-malignant respiratory disease are chronic effects from prolonged exposure to crystalline silica.

g) Signs and Symptoms of Exposure: There are generally no immediate signs and symptoms of exposure to crystalline silica other than minor respiratory and/or eye irritation.

h) Medical Conditions (Aggravated by Exposure): The condition of individuals with existing lung disease such as bronchitis, emphysema and chronic obstructive pulmonary disease (COPD) may be aggravated by exposure to crystalline silica.

4.3 Instruction concerning immediate medical attention and special treatment:

Visit a doctor in the case of nausea.
## SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing agents: **Suitable**: Non-flammable. Packaging material used may be flammable, use appropriate extinguishing agent depending on the surrounding fire.

**Non-suitable**: None are specified.

5.2 Special hazards following from the substance or mixture: None are known.

5.3 Instructions for fire-fighters: Use equipment depending on the surrounding fire. Non-flammable material.

## SECTION 6. PRECAUTIONS IN CASE OF ACCIDENTAL LEAK

6.1 Precautions for personnel protection, protective means and emergency procedures:

6.1.1 For staff except for emergency intervention staff

Restrict unauthorised access to the exposed area until emergency elimination. In the case of large leaks secure the area against unauthorised access.

6.1.2 For emergency intervention staff

Prevent further dust spread through the air. In the case of dusty environment use personal protective equipment (see section 8). Other special precautions are not necessary.

6.2 Environment protection measures: No acute negative effects on the environment. Prevent further dust spread through the air. Place the devalued product in specified waste collection containers.

6.3 Methods and materials for leak minimisation and cleaning: Sweep up the spilled product and place in specified waste collection containers. Prevent excessive dust formation during cleaning. Other special precautions are not necessary.

6.4 References to other sections: Personal protective equipment – section 8.


## SECTION 7. STORAGE AND HANDLING

7.1 Precautions for safe handling:

7.1.1 Particular recommendations: Prevent excessive (undesirable) dust formation during handling.

7.1.2 General hygienic instructions for work: Use personal protective equipment where necessary. Other special precautions are not necessary.

7.2 Conditions for safe storage: Store in a dry place. Prevent dust formation. Storage limits: None are specified.

7.3 Specific final application requirements: No other requirements and instructions except for the data included in section 1.2.

## SECTION 8. EXPOSURE LIMITATIONS/PERSONAL PROTECTIVE EQUIPMENT

8.1 Control parameters: Governed by Government Regulation no 361/2007 Coll., stipulating conditions of occupational health protection, as amended, Annex 3:

No hygienic limits are specified for the product. Due to the nature of the mixture the following values may be applied:

For dust with prevailingly fibrogenic effect:

### US. ACGIH Threshold Limit values

<table>
<thead>
<tr>
<th>Substance</th>
<th>TWA (mg.m⁻³) (respirable fraction)</th>
<th>TWA (mg.m⁻³) (total concentration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cristobalite (14464-46-1)</td>
<td>0.025</td>
<td>--</td>
</tr>
<tr>
<td>Quarz (SiO₂) (14808-60-7)</td>
<td>0.025</td>
<td>--</td>
</tr>
</tbody>
</table>
### US. OSH Table Z-3 (29 CRF 1910.1000)

<table>
<thead>
<tr>
<th>Substance</th>
<th>TWA (mg·m⁻³) (respirable fraction)</th>
<th>TWA (mg·m⁻³) (total concentration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cristobalite (14464-46-1)</td>
<td>0,05</td>
<td>0,15</td>
</tr>
<tr>
<td></td>
<td>1,2 (mppcf)</td>
<td>--</td>
</tr>
<tr>
<td>Quarz (SiO₂) (14808-60-7)</td>
<td>0,1</td>
<td>0,3</td>
</tr>
<tr>
<td></td>
<td>2,4 (mppcf)</td>
<td>--</td>
</tr>
<tr>
<td>Other silicates</td>
<td>PEL (mg·m⁻³) (total fraction)</td>
<td>PELc (mg·m⁻³) (total fraction)</td>
</tr>
<tr>
<td>(Fᵢ = respirable fraction)</td>
<td>2.0</td>
<td>10 : Fᵢ</td>
</tr>
<tr>
<td>Amorphous SiO₂</td>
<td>4.0</td>
<td></td>
</tr>
</tbody>
</table>

For dust with potential fibrogenic effect:

<table>
<thead>
<tr>
<th>Substance</th>
<th>PELc (mg·m⁻³) (total fraction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium and its oxides</td>
<td>10</td>
</tr>
<tr>
<td>(except for gamma Al₂O₃)</td>
<td></td>
</tr>
</tbody>
</table>

### Exposure limitations:

8.2.1 Appropriate technical controls: Ventilation – Where dust content in the air may be controlled with technical methods (local exhaustion, ventilation etc.)

8.2.2 Individual protective measures including personal protective equipment:

- **Hygienic conditions:** Prevent eye contact, do not inhale. Do not stay in places with higher dust concentrations without cause. Observe routine personal hygiene before eating, drinking, toilet use and after work.

- **Personal protective equipment:**
  - **Eye and face protection:** Use protective goggles with side pieces in the places of excessive dust formation.
  - **Skin – hand protection:** Protective work gloves (for example leather).
  - **Skin – other protection:** Work clothes and boots.
  - **Respiratory tract protection:** In the case of exceeded NPK (exposure limit) use a respirator with filter against fibrogenic dust.

**Thermal hazard:** N/A
8.2.3 Limitations of environment exposure:
Prevent flying dust during cutting, grinding, breaking etc.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES
The information relates to mixture.
9.1 Information about basic physical and chemical properties
a) Appearance
   Solid state – refractory moulded products, different colours.
b) Odour
   None.
c) Odour threshold
   Not specified.
d) pH
   6 - 8
e) Melting / solidification point
   Not specified.
f) Initial boiling point and range
   Not specified.
g) Ignition point
   Non-flammable.
h) Evaporation speed
   Not specified.
i) Flammability (solid subst., gas)
   Non-flammable.
j) Upper/lower limit of flammability
   Not specified or explosiveness
k) Vapour pressure
   Not specified.
l) Vapour density
   Not specified.
m) Relative density
   1.80 - 1.95 g/cm$^3$ (bulk density)
n) Solubility
   Non-soluble

o) Differentiation coefficient: n-octanol/water
   Not specified.
p) Self-ignition temperature
   Non-flammable.
q) Decomposition temperature
   Not specified.
r) Dynamic viscosity
   Not specified.
s) Explosive properties
   None.
t) Oxidisation properties
   None.

9.2. Other information
Solvent content (VOC)
0% (according to definition of the air protection act)

Note:
"Not specified": irrelevant for the product
"None": not available for the product.

SECTION 10. STABILITY AND REACTIVITY
10.1 Reactivity:
No decomposition under appropriate storage and use conditions.

10.2 Chemical stability:
The product is stable under normal conditions.

10.3 Possible dangerous reactions:
None.

10.4 Conditions to be avoided:
None.

10.5 Incompatible materials:
None.

10.6 Dangerous decomposition products:
None.

SECTION 11. TOXICOLOGICAL INFORMATION
11.1 Toxicity Data:
11.1.1) Silicious: Silicosis is the major concern associated with occupational exposure to crystalline silica. It is caused by inhalation and retention of respirable crystalline silica dust. Silicosis can exist in chronic (ordinary), accelerated, or acute forms.

   The most common form of silicosis is chronic (ordinary) silicosis, which can occur after many years of exposure to respirable silica particles that exceed occupational exposure limits.
11.1.5 Autoimmune Diseases: There is evidence that exposure to respirable crystalline silica can be associated with increased incidence of several autoimmune disorders such as: scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. These autoimmune diseases may occur in patients with or without existing silicosis.

11.1.4) Tuberculosis: Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if they are exposed to persons with tuberculosis.

11.1.5) Kidney disease: There is evidence that exposure to respirable crystalline silica (without silicosis), or silicosis, could be associated with an increased incidence of kidney diseases, including end stage renal disease.

The occupational exposure limit (OEL) for crystalline silica varies by individual.
country. It is up to the individual users of this product to determine the legally enforceable OEL for its location. The American Conference of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV) of 0.025 mg/m³ for crystalline silica (respirable fraction). This TLV is an 8-hour time weighted average exposure level that is believed to be protective for most workers for a working lifetime.

11.2 Occupational Exposure Limits: Permissible Exposure Limits (PELs) mandated by the U.S Occupational Safety and Health Administration (OSHA) are listed below:

<table>
<thead>
<tr>
<th>Substance</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz - 10 mg/m³ (respirable fraction) SiO₂</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Cristobalite - 5 mg/m³ (respirable fraction) SiO₂</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Tridymite - 5 mg/m³ (respirable fraction) SiO₂</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Quartz - 30 mg/m³ (total particulate) SiO₂</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Cristobalite - 15 mg/m³ (total particulate) SiO₂</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Tridymite - 15 mg/m³ (total particulate) SiO₂</td>
<td>2 mg/m³</td>
</tr>
</tbody>
</table>

11.3 Suspected Cancer Agent: OSHA: No

11.4 Irritancy of Product: Product may cause irritation by inhalation and eye contact.

11.5 Sensitization to the Product: Not known to cause sensitization

11.6 Reproductive Toxicity Information: Not known to cause reproductive toxicity

11.7 Medical Conditions Aggravated by Exposure: The condition of individuals with existing lung disease such as bronchitis, emphysema and chronic obstructive pulmonary disease (COPD) may be aggravated by exposure to crystalline silica.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity for aquatic organisms: A natural material by origin, no assumed toxic effects on aquatic organisms.

12.2 Persistence and degradability: The product is inert and does not degrade.

12.3 Bioaccumulation potential: Data not available.

12.4 Mobility in soil: Data not available.

12.5. Results of PBT and VpVBA assessment: Not required.

12.6. Other unfavourable effects: The product is inert and other potential negative effects are connected with mechanical effects of dust formation.

SECTION 13. DISPOSAL INSTRUCTIONS

13.1 Methods of waste disposal: Dumping on specified dumps. Disposal by release to sewerage: Excluded by the product nature.
### MATERIAL SAFETY DATA SHEET / USA (Nr.07)

**P-D Refractories CZ a.s.**

Nádražní 218
679 63 Velké Opatovice

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**Waste classification according to Decree 93/2016 Coll. (Waste Catalogue):**

- **10 12 08** Waste ceramic goods, bricks, tiles and construction materials (after thermal processing), cat. O.  

**13.2 Methods of contaminated waste disposal:** According to the nature of package construction material the waste is classified in group 15 01 Packaging materials (including separately collected communal waste packaging materials), cat. O. Empty package without content residues may be disposed of by procedures dictated by the construction material of the package (repurchase, recycling, dumping, incineration).

**13.3 Waste legislation:**  
- Act no 185/2001 Coll., on Waste  
- Decree no 93/2016 Coll. (Waste Catalogue)  
- Decree no 383/2001 Coll. on waste Disposal Details  
- Not applicable.

**13.4 Waste codes USA**  
- **USA**

**13.5 Disposal instructions:** This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

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### SECTION 14. TRANSPORT INFORMATION

**14.1** UN no: Not subject to regulations for dangerous object transport.  

**14.2 Official (UN) denomination for transportation:** Not subject to regulations for dangerous object transport.  

**14.3 Class/classes of dangers for transport:** Not subject to regulations for dangerous object transport.  

**14.4 Package group:**  
- Not subject to regulations for dangerous object transport.  

**14.5 Environment hazards:** Not subject to regulations for dangerous object transport.  

**14.6 Special safety precautions for users:**  
- Not subject to regulations for dangerous object transport.  

**14.7 Bulk transport according to Annex II MARPOL 73/78 and IBC regulation:** Not subject to regulations for dangerous object transport.

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### SECTION 15. REGULATORY INFORMATION

**15.1 Regulations concerning safety, health and environment/specific legislation concerning substance or mixture:**  
- Act no 254/2001 Coll. on Waters (Water Act), as amended  
- Act no 185/2001 Coll., on Waste, as amended  
- Act no 201/2012 Coll., on Air Protection, as amended by later regulations  
- Act no 258/2000 Coll., on Public Health Protection, as amended  
- Act no 350/2011 Coll. of 27 October 2011 on Chemical Substances and Mixtures and on amendment to certain other acts (Chemical Act), as amended by later regulations  
- ČSN 75 3415 Water Protection against Oil Substances. Objects for Oil Substance Handling and Storage  
- Government Regulation no 361/2007 Coll., as amended, stipulating conditions for occupational health, including PEL and NPK exposure limits (see above)  
- Regulation (EC) no 1907/2006 on Registration, Evaluation, Authorisation & Restriction of Chemicals and on Establishment of European Chemical Agency, as amended (REACH)  
15.2 Chemical safety assessment
There are no available data for assessment of safety of chemical substances for this material.

15.3 Regulatory Information for USA

US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
CERCLA/SARA Hazardous Substances - Not applicable.
All chemical substances in this product are listed on the TSCA chemical substance Inventory where required.

CERCLA (Superfund) reportable quantity
None

State regulations WARNING: This product contains a chemical known to the State of California to cause cancer.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance
Quartz (SiO2) (CAS 14808-60-7) Listed: October 1, 1988 Carcinogenic.

US - New Jersey RTK - Substances: Listed substance
SILICA, CRISTOBALITE (CAS 14464-46-1) Listed.
SILICA, QUARTZ (CAS 14808-60-7) Listed.

US - Pennsylvania RTK - Hazardous Substances: Listed substance
Cristobalite (SiO2) (CAS 14464-46-1) Listed.
QUARTZ DUST (CAS 14808-60-7) Listed.

SECTION 16. OTHER INFORMATION

Data on amendments and revisions:

<table>
<thead>
<tr>
<th>Rev. no</th>
<th>Date</th>
<th>Amendment description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14.2.2014</td>
<td>Addition exposure limits, toxicology, recycling and emergency information for USA</td>
</tr>
<tr>
<td>2</td>
<td>04.08.2017</td>
<td>Modification of the heading, Sec. 3, 14, 15, in compliance with Commission (EU) No. 2015/830, regulation update</td>
</tr>
<tr>
<td>3</td>
<td>10.01.2018</td>
<td>Addition of newly labeled qualities</td>
</tr>
</tbody>
</table>

Important literature references and data sources: Data contained in this material safety data sheet were compiled from materials of the manufacturer and on the basis of effective CR and EU legislation.
In the case of mixture information about which information evaluation method according to Article 9 of Regulation (EC) no 1272/2008 was used for classification purposes:
Approximation according to hazards of components and physical nature of product.
List of relevant R-phrases, standard risk phrases, safety phrases and/or instructions for safe handling. Full wording of all phrases and instructions not included in sections 2 to 15: None are included.
Instructions concerning all training courses for staff responsible for human health and environment protection:
Staff should be informed about the principles of work with the product and required personal protective equipment in the context of regular OHS training.

Recommended limitations for use: Use exclusively for purposes specified by the manufacturer.

Recommended restrictions USA: Users should be informed of the potential presence of respirable dust and respirable crystalline silica as well as their potential hazards. Appropriate training in the proper use and handling of this material should be provided as required under applicable regulations.

HMIS® ratings
Health: 1*
Flammability: 0
Physical hazard: 0

NFPA ratings
Health: 1
Flammability: 0
Instability: 0

Other information: This safety data sheet is issued by P-D Refractories CZ a.s. Velké Opatovice on request of customer. Regulation (EC) no 1907/2006 on Registration, Evaluation, Authorisation & Restriction of Chemicals and on Establishment of European Chemical Agency, as amended (REACH) does not apply to the product in question.

The above data describe exclusively safety requirements for products and are based on current knowledge. They do not describe product properties in the sense of quality parameters and legislative regulations for warranty compliance.

End of safety data sheet.