DAMIANOS M. STROUMBOULIS Ltd
45 Konstantinoupoleos st. Piraeus 18540
T. +30 210 4115033 F. +30 210 4134 187
www.stroumboulis.gr info@stroumboulis.gr

Natural Silica Sand

MATERIAL SAFETY DATA SHEET
(MSDS)

1. IDENTIFICATION OF THE SUBSTANCE/ PREPARATION AND OF THE COMPANY/ UNDERTAKING

1.1. Identification of the substance or product

Quartz sand with SiO_2 >98%, Al_2O_3, Fe_2O_3, CaO.

1.2. Use of the substance/product

Quartz sand is used in glass and silicic bricks manufacturing plants. It is the main component for a variety of structural products, such as specific cements, plasters, construction applications etc

1.3. Company/undertaking identification

Damianos M. Stroumboulis ltd
43 Konstantinoupoleos st. Piraeus 18540 GR
tel: +30 210 4115033
fax: +30 210 4134187
email: damianst@otenet.gr

1.4. Emergency telephone

Damianos M. Stroumboulis ltd
Phone: +302104115033
National Center for Direct Help: 166
Poisoning Center: +302107793777
Fire department: 199
email: damianst@otenet.gr

2. HAZARDS IDENTIFICATION

According to the directives 67/548/EEC and 1999/45/EC the product is characterized as harmful in case of inhalation and long-term exposure. The product is classified as dangerous according to the directive 1999/45/EC. Find information provided through tag in section 15.

3. COMPOSITION/INFORMATION ON INGREDIENTS

	Components	CAS#	Classification
1	Silicon dioxide (SiO_2)	14808-60-7	R48/20, S22, S38
2	Aluminium oxide (Al_2O_3)	1344-28-1	S24/25
3	Iron(III) oxide (Fe_2O_3)	1309-37-1	--
4	Calcium oxide (CaO)	1305-78-8	C, R35, R14, R22, S25, S36/37/39, S45
5	Organic matter	--	--
6	Water	--	--

3.1. Nature and concentration of ingredients

Quartz sand consists of silicon dioxide (>98%), aluminium oxide (Al_2O_3), Iron (III) oxide (Fe_2O_3) and calcium oxide (CaO), organic matter (<0.1%) and humidity (approximately 0.1-0.2%).

3.2. Classification as dangerous

The product is classified as dangerous according to the directive 1999/45/EC.

Substances / Components	Substance concentration in product (%w/w)	Risk phrases	Concentration limits in part B Annex II Directive 1999/45/EC (%w/w)
Silicon dioxide (SiO_2)	98.9	R48 R20	(1) $C_п \geq 25\%$
Aluminium oxide (Al_2O_3)	0.5	--	--
Iron(III) oxide (Fe_2O_3)	0.1	--	--
Calcium oxide (CaO)	0.1	R14, R22, C, R35	-- $C_п \geq 25\%$ (2)
Organic matter	<0.1	--	--
Water	0.2	--	--

(1)For substances classified as R48, the product, in proportion to substance's concentration is classified as follows:

Substance classification	Product classification	
T, R48 (via respiratory road)	T	X_n
	$C_п \geq 10\%$	$1\% \leq C_п < 10\%$
X_n, R48 (via respiratory road)		$C_п \geq 10\%$

(2) For substances classified as R35, the product in proportion to substance's concentration is classified as follows:

Substance classification	Product classification			
C, R35	C, R35	C, R34	X_i, R41	X_i, R36,R37,R38
	$C_n \geq 10\%$ R35 obligatory	$5\% \leq C_n < 10\%$ R34 obligatory	5%	$1\% \leq C_n < 5\%$ R36/38 obligatory

3.3. Classification as no dangerous

The product is classified as dangerous according to the directive 1999/45/EC.

3.4. Classification and labelling inventory of substances in accordance with their human health and environmental hazards and substances with a Community workplace exposure limit

Product contains the following substances. For risk phrases see section 15.

	Substances / Components	Risk Phrases
1	Silicon dioxide (SiO_2)	T, R48, R20
2	Aluminium oxide (Al_2O_3)	--
3	Iron(III) oxide (Fe_2O_3)	--
4	Calcium oxide (CaO)	C, R35, R14, R22
5	Organic matter	--
6	Water	--

3.5. Name, EINECS or ELINCS number, CAS number and IUPAC name

	Substances / Components	Number EINECS or ELINCS	CAS Number	IUPAC name
1	Silicon dioxide (SiO_2)	238-878-4	14808-60-7	dioxosilane
2	Aluminium oxide (Al_2O_3)	215-691-6	1344-28-1	aluminium oxide
3	Iron(III) oxide (Fe_2O_3)	215-168-2	1309-37-1	iron(III) oxide
4	Calcium oxide (CaO)	215-138-9	1305-78-8	Calcium oxide
5	Organic matter	--	--	--
6	Water	--	--	--

3.6. Chemical nature of confidential substances

The product does not contain substances, their identification must be confidential.

4. FIRST AID MEASURES

- First aid measures

Eye Contact	Check for and remove contact lenses. Immediately wash eyes with large amounts of water, for at least 15 minutes. If irritation persists, get medical attention.
Skin Contact	Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.
Inhalation	No specific first aid necessary since the adverse health effects associated with exposure to crystalline silica (quartz) result from chronic exposures. If there is a gross inhalation of crystalline silica, remove the person immediately to fresh air, give artificial respiration as needed. Seek medical attention as needed.
Ingestion	Do NOT induce vomiting unless medical personnel do so. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

- Immediate medical attention is not required
- Wear eye and respiratory protection mask.

5. FIRE-FIGHTING MEASURES

- Flammability of the Product: Non-flammable.
- Explosiveness of the Product: Non-explosive
- Combustion products:No formed
- Suitable extinguishing media: No required.
- Special exposure hazards arising from the substance or product itself, combustion products, resulting gases: No existed.
- Special protective equipment for fire-fighters: No required.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions: Wear the appropriate protective equipment as specified in Section 8.
- Environmental precautions: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose according to local and regional authority requirements.

7. HANDLING AND STORAGE

7.1. Handling

- Handle product in such a manner as to reduce and/or minimize the dust, possibly created when handling. Use adequate ventilation and dust collection equipment. Wear the proper personal protection equipment as described in Section 8. Use good housekeeping practices to prevent the accumulation of silica dust in the workplace.

7.2. Storage

- Keep container tightly closed. Keep container in a cool, well-ventilated area.
- Avoid breakage of bagged material or the accidental release of bulk material. Use dustless methods (vacuum) during clean up. Do not dry sweep. Wet down spilled material if sweeping is the most feasible method of clean up.
- Provide the employees with the proper training related to safe handle and storage practices.

7.3. Specific use(s)

Specific attention must be paid to the health protection from powder, during product use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure limit values

	Exposure limit values (mg/m^3)					
	OSHA		NIOSH		ACGIH	
Product	TWA	STEL	TWA	STEL	TWA	STEL
Crystal quartz sand	10	N.R.	0,05	N.R.	0,05	N.R.

* N.R.: No referred

8.2. Exposure controls

8.2.1. Occupational exposure controls

- According to Article 4, directive 98/24/EC, the design of appropriate work processes and engineering controls, the use of adequate equipment and materials, the application of collective protection measures at source, and the use of individual protection measures are required.
- Personal protective equipment is defined below considering the directive 89/686/EEC for providing suitable protection. Take into account Council Directive 89/686/EEC and make reference to the appropriate CEN standards.
- Handbooks concerning measures for individual protection must be studied by employees.
- Individual protection equipment must be replaced after the expiry date.

8.2.1.1. Respiratory protection

Product may form dust. For respiratory system protection the use of infiltration equipment is recommended consisting of a filtrating mask and white colour filter code P1. Equipment must correspond to EN 149 and filter to EN 143 standards. In case of severe problem (100 times the limit value, without overstepping $5000mg/m^3$), the use of a white color filter code P2 is recommended, binding the 94% of particles.

8.2.1.2. Hand protection

No necessary. For hand protection Lattex gloves are recommended.

8.2.1.3. Eye protection

For eye protection the use of hood or glasses are recommended. Marking of the frame: code 4 (against dust with a particle size greater than 5µm. Equipment must correspond to EN 166 standards.

8.2.1.4. Skin Protection

No necessary. For skin protection suits type 5 (impermeable to chemicals in the form of solid particles - dust) is recommended. Garments

must possess the CE mark and certification.

8.2.2. Environmental Exposure Controls

No specific requirements. Product is not eco-toxic and ubiquitous on earth.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General information

Physical state: Solid
Appearance: Crystalline
Product's Color: Light gray-brown
Odour: Odourless

9.2. Important health, safety and environmental information

Properties	Product
pH	--
Boiling point/boiling range	2230^0C
Flash point	--
Flammability	--
Explosive properties	--
Oxidizing properties	--
Vapour pressure	--
Relative density	--
Water solubility	Minimal
Solubility	Minimal
Partition coefficient: n-octanol/water	--
Viscosity	--
Vapour density	--
Evaporation rate	--

*Soluble in hydrofluoric acid

9.3. Other information

Important safety parameters	Preparation
Miscibility	--
Conductivity	--
Melting point/melting range	2200^0C
Gas group	--
Auto-ignition temperature	--

10. STABILITY AND REACTIVITY

The product is chemically stable. Contact with powerful oxidizing agents, such as fluorine, chlorine trifluoride and oxygen difluoride, may cause fires. Hazardous Polymerization does not occur. Product dissolves in hydrofluoric acid and produces a corrosive gas.

- Conditions must be avoided:
  Product is stable under normal handling and storage conditions. The product does not induce under conditions such as temperature, pressure, light, etc. Reaction with powerful oxidizing agents accelerates under high temperatures.
- Materials must be avoided:
  Powerful oxidizing agents.

- Hazardous Decomposition or Byproducts:
  Product is stable. Hazardous decomposition materials appear only during the reaction with hydrofluoric acid. Reaction accelerates under high temperatures. Corrosive silicon tetrafluoride is produced.

11. TOXICOLOGICAL INFORMATION

Long-term exposure to airborne respirable crystalline quartz dust may cause permanent lung harm, most common as silicosis. For that reason the product is classified as possible cancerous substance for humans. Many studies highlight a series of links between quartz silica exposure and other health concerns, including rheumatoid arthritis, schleroderma, lupus and renal disease.

CAS#: 14808-60-7
Acute oral toxicity (Oral, mouse): LD50 = N.R.*
Acute skin toxicity (Oral, rabbit) : LD50 = N.R.
Acute respiration toxicity αναπνοής (Oral, rat): LD50 = N.R.
Carcinogenicity: N.R.
Epidemiology: N.R.
Teratogenicity: N.R.
Reproductive Effects: N.R.
Mutagenicity: N.R.
Neurotoxicity: N.R.
Toxicity to Animals: N.R.
Chronic Effects on Humans: N.R.
*Specific values not referred

12. ECOLOGICAL INFORMATION

Ecotoxicity	No ecotoxic. There are no data that suggests that the product is toxic to birds, fish, invertebrates, microorganisms or plant.
Mobility	The product may present slight mobility. Quartz sand crystals may be transferred from the release place. Surface tension is not required.
Persistence and degradability	Not biodegradable. Degradable through oxidation. Not degradable in a wastewater plant
Bioaccumulative potential	Not bioaccumulative. Coefficient prices (Kow and BCF) no referred.
Assessment results ABT	Not referred
Other adverse effects	No available data for negative consequences to the environment, such as ozone layer depletion, photochemical ozone creation, contribution to the global warming and endocrine disrupting.

13. DISPOSAL CONSIDERATIONS

Waste packing management must be done according to the national legislation. Product may be landfilled and covered to minimize the hazard of dust inhalation.

14. TRANSPORT INFORMATION

Quartz sand is not a hazardous material for purposes of transportation. Do not come under any class ADR/RID (for road/ railway transportation), or under International Maritime Organization for maritime transportation IMO/IMDG (International Maritime Dangerous Goods), or air transportation ICAO/IATA (International Civil Aviation Organization).

15. REGULATORY INFORMATION

Labeling done according to Directive 1999/45/EC.

- Hazard Symbols:

Xn (in case of dust inhalation)

- Labeling

Xn Harmful
(in case of dust inhalation)

- R – phrases

R48/R20: Harmful: After long-term exposure, when inhalated, may induce harm in human health.

- S – phrases

S22: Do not breathe the dust
S38: Use appropriate respiratory apparatus, in case of inadequate ventilation.

16. OTHER INFORMATION

Catalog of relevant risk and safety phrases R and S, that were mentioned in sections 3 and 4 and they are not mentioned in section 15.

R35: Causes severe burns
R14: Reacts violently with water
R22: Harmful if swallowed

S24/25: Avoid contact with skin or eyes
S36/37/39: Wear suitable protective clothing, gloves, eye/face protection
S45: In case of accident or if you feel unwell, seek medical advice immediately

- **C :** Corrosive

Sources of key data used to compile the Safety Data Sheet

http://www.coshh-essentials.org.uk

National and European Legislation

http://www.osha.gov/SLTC/healthguidelines/

Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Disease", Parkes, W. Raymond (1994). Occupational Health Guideline for Crystalline Silica, http://www.cdc.gov/niosh/topics/silica/default.html

A Guide To Working Safely With Silica: If It's Silica, It's Not Just Dust (1997) http://www.cdc.gov/niosh/topics/silica/default.html

Silicosis-Related Years of Potential Life Lost Before Age 65 Years - United States, 1968-2005

MMWR Weekly for July 18, 2008 / 57(28);771-775, http://www.cdc.gov/niosh/topics/silica/default.html

Silica, Silicosis, and Progressive Systemic Sclerosis, British Journal of Industrial Medicine, Volume 42, Number 12, pp. 838 –843 (1985).