

## 1. IDENTIFICATION OF PREPARATION

### Product Code and Names:

<b>77710</b> – Epirok Aggregate Mix No. 1	<b>77730</b> – Epirok Aggregate Mix No. 3	<b>77740</b> – Epirok Aggregate Mix No. 4
<b>77750</b> – Epirok Aggregate Mix No. 5	<b>77760</b> – Epirok DSC Component C	<b>77780</b> – Epirok HDS Component C

**Chemical Name:** Silica aggregate.

### Identification of Company:

<p><b>CHINA:</b>  <b>Terraco Architectural Coatings China Co., Ltd.</b>            Tel: +86 (0)20 8759 4742            Fax: +86 (0)20 8526 8056            E-mail: sales@terraco.com.cn            Web: www.terraco.com.cn</p> <p><b>Terraco Chemical (Shanghai) Co., Ltd.</b>            Tel: +86 (0)21 621020 48 / 18            Fax: +86 (0)21 625205 47            Email: sales@terraco.com.cn            Web: www.terraco.com.cn</p> <p><b>EGYPT:</b>  <b>Terraco Egypt Chemical Industries S.A.E.</b>            Tel: +20 (0)22 29184 53 / 57 / 58            Fax: +20 (0)22 29184 80            E-mail: terraco@terraco.com.eg            Web: www.terraco.com.eg</p> <p><b>JORDAN:</b>  <b>Jordan Swedish Polymers Industrial Corp.</b>            Tel: +962 (0)6 553 8751            Fax: +962 (0)6 553 6560            E-mail: terraco@nol.com.jo            Web: www.terraco.jo</p> <p><b>IRELAND:</b>  <b>Terraco Technical Centre, Ireland</b>            Tel: +353 (0) 404 66555            Fax: +353 (0) 404 66654            E-mail: technical-centre@terraco.com            Web: www.terraco.com</p>	<p><b>PAKISTAN:</b>  <b>Terraco Pakistan Pvt. Ltd.</b>            Tel: +92 (0)42 3529 70 56-8            Fax: +92 (0)42 3529 70 55            Email: terraco@terraco.pk            Web: www.terraco.com</p> <p><b>ROMANIA:</b>  <b>Terraco Romania SRL</b>            Tel: +40 (0)749 203 133            Fax: +40 (0)318 148 810            E-mail: ahaque@terraco.com            Web: www.terraco.com</p> <p><b>RUSSIA:</b>  <b>OOO Terraco Sweden Ltd, Russia</b>            Tel: +7 (0)495 9212 237            Fax: +7 (0)495 6273 881            E-mail: adm@terraco.ru            Web: www.terraco.ru</p> <p><b>OOO Terraco Vostok Ltd</b>            Tel: +7 (0)4212 410563            Fax: +7 (0)4212 410591            E-mail: terracovostok@terraco.khn.ru            Web: www.terraco.com</p> <p><b>SOUTH KOREA:</b>  <b>Terraco Korea Co., Ltd</b>            Tel: +82 (0) 2 5611 551            Fax: +82 (0)2 5671 771            E-mail: terraco@terraco.co.kr            Web: www.terraco.co.kr</p>	<p><b>THAILAND:</b>  <b>Terraco Industry (Thailand) Limited</b>            Tel: +66 (0)2 946 68 56 / 58            Fax: +66 (0)2 946 68 59            E-mail: terraco@terraco.co.th            Web: www.terraco.com</p> <p><b>TURKEY:</b>  <b>Terraco Yapi Malzemeleri Sanayi Ve Ticaret AS</b>            Tel: +90 (0)222 236 0423            Fax: +90 (0)222 236 0425            E-mail: terraco@terraco.com.tr            Web: www.terraco.com.tr</p> <p><b>UAE:</b>  <b>Terraco UAE Ltd</b>            Tel: +971 (0)4 326 2699            Fax: +971 (0)4 326 2733            E-mail: terraco@terraco.ae            Web: www.terraco.com</p> <p><b>UK:</b>  <b>ADDAGRIP</b>            Tel: +44 (0)1825 761 333            Fax: +44 (0)1825 768 566            E-mail: sales@addagrip.co.uk            Web: www.addagrip.co.uk / www.terraco.com</p> <p><b>VIETNAM:</b>  <b>Terraco Vietnam Co., Ltd</b>            Tel: +84 (0)650 3 820 100            Fax: +84 (0)650 3 820101            E-mail: terraco@terraco.com.vn            Web: www.terraco.com</p>
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## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Amount	CAS Number
Crystalline Silica (Quartz)	100%	14808-60-7

## 3. HAZARDS IDENTIFICATION

### Emergency Overview:

The material is an off-white aggregate. It is not flammable, combustible or explosive. It does not cause burns or severe skin or eye irritation. A single exposure will not result in serious adverse health effects.

Crystalline silica (quartz) is not known to be an environmental hazard.

Crystalline silica (quartz) is incompatible with hydrofluoric acid, fluorine, chlorine tri-fluoride or oxygen di-fluoride.

Potential Health Effects:	
<b>Skin Contact:</b>	Not applicable.
<b>Inhalation</b>	
<ul style="list-style-type: none"> <li>• <b>Silicosis:</b></li> </ul>	Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs. Silicosis may be progressive; it may lead to disability and death.
<ul style="list-style-type: none"> <li>• <b>Cancer:</b></li> </ul>	Crystalline silica (quartz) inhaled from occupational sources is classified as carcinogenic to humans.
<ul style="list-style-type: none"> <li>• <b>Autoimmune Disease:</b></li> </ul>	There are some studies that show excess numbers of cases of scleroderma and other connective tissue disorders in workers exposed to respirable crystalline silica.
<ul style="list-style-type: none"> <li>• <b>Tuberculosis:</b></li> </ul>	Silicosis increases the risk of tuberculosis.
<ul style="list-style-type: none"> <li>• <b>Nephrotoxicity:</b></li> </ul>	There are some studies that show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica (quartz).
<b>Eye Contact:</b>	Crystalline silica (quartz) may cause abrasion of the cornea.
<b>Ingestion:</b>	Not applicable.
Chronic Effects:	
The adverse health effects caused by chronic exposure include: silicosis, cancer, autoimmune diseases, tuberculosis and nephrotoxicity.	
Signs and Symptoms of Exposure:	
Generally, there are no signs or symptoms of exposure to crystalline silica (quartz).	
Medical conditions generally aggravated by exposure:	
The condition of individuals with lung disease (e.g. bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.	
See section 11, Toxicological Information, for additional details on potential adverse health effects.	

#### 4. FIRST AID MEASURES

<b>Inhalation:</b>	No specific first-aid is necessary since the adverse health effects associated with exposure to crystalline silica (quartz) results from chronic exposure. If there is a gross inhalation of crystalline silica (quartz), remove the person immediately to fresh air, give artificial respiration as needed, seek medical attention as needed.
<b>Eye contact:</b>	Wash immediately with water. If irritation persists, seek medical attention.
<b>Skin contact:</b>	Not applicable.
<b>Ingestion:</b>	Not applicable.

#### 5. FIRE FIGHTING MEASURES

Crystalline silica (quartz) is not flammable, combustible or explosive.
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#### 6. ACCIDENTAL RELEASE MEASURES

<b>Spills:</b>	Use dustless methods (vacuum) and place into closable container for disposal, or flush with water. Do not dry sweep and wear protective equipment specified below.
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#### 7. HANDLING AND STORAGE

<b>Handling and use:</b>	<p>Do not breathe dust.          Use adequate ventilation and dust collection.          Keep airborne dust concentrations below PEL.          Do not rely on your sight to determine if dust is in the air.          Silica may be in the air without a visible dust cloud.          If dust cannot be kept below permissible limits, wear a respirator approved for silica dust when using, handling, storing or disposing of this product or bag. Practice good housekeeping.          Do not permit dust to collect on walls, floors, sills, ledges, machinery or equipment.          Maintain, clean and fit test respirators in accordance with OSHA regulations. Maintain and test ventilation and dust collection equipment.          Wash or vacuum clothing that has become dusty.          See also control measures in Section 8.</p>
<b>Storage:</b>	<p>Avoid breakage of bagged material or spills of bulk material.          See control measures in Section 8.</p>

#### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<b>Local Exhaust</b>	
Use sufficient local exhaust to reduce the level of respirable crystalline silica to below the PEL. See ACGIH "Industrial Ventilation, A Manual of Recommended Practice" (latest edition).	
<b>Respiratory Protection</b>	
The following chart specifies the types of respirators which may provide respiratory protection from crystalline silica.	
<b>Particulate Concentration:</b>	<b>MINIMUM RESPIRATORY PROTECTION*</b>
10 x PEL or less	<ul style="list-style-type: none"> <li>• Any particular respirator, except single-use or quarter-mask respirator.</li> <li>• Any fume respirator or high efficiency particulate filter respirator.</li> <li>• Any supplied-air respirator.</li> <li>• Any self-contained breathing apparatus.</li> </ul>
50 x PEL or less	<ul style="list-style-type: none"> <li>• A high efficiency particulate filter respirator with a full face-piece.</li> <li>• Any supplied-air respirator with a full face-piece, helmet or hood.</li> <li>• Any self-contained breathing apparatus with a full face-piece.</li> </ul>
500 x PEL or less	<ul style="list-style-type: none"> <li>• A type C supplied-air respirator operated in pressure-demand or other positive pressure or continuous-flow mode.</li> </ul>
Greater than 500 x PEL or entry and escape from unknown concentrations.	<ul style="list-style-type: none"> <li>• Self-contained breathing apparatus with a full face-piece operated in pressure-demand mode.</li> <li>• A combination respirator which includes a type C supplied-air respirator with a full face-piece operated in pressure-demand or other positive pressure continuous-flow mode and an auxiliary self-contained breathing apparatus operated in pressure-demand or other, positive pressure mode.</li> </ul>
<p><b>*Use only NIOSH-approved or MSHA-approved equipment.</b>          See also ANSI standard Z88.2 (latest version "American National Standard for Respiratory Protection").</p>	

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Off white aggregate.
<b>Odour:</b>	None.
<b>Vapour pressure:</b>	None.
<b>Specific Gravity (Water = 1):</b>	2.65.
<b>Vapour Density (Air = 1):</b>	None.
<b>Evaporation Rate (Butyl Acetate = 1):</b>	None.
<b>Boiling point/range:</b>	4046°F.
<b>Melting Point:</b>	3110°F.
<b>Water solubility:</b>	Insoluble in water.

#### 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Crystalline silica (quartz) is stable.
<b>Incompatibility (Materials to avoid):</b>	Contact with powerful oxidizing agents, such as fluorine, chlorine trifluoride and oxygen difluoride, may cause fires.
<b>Hazardous Decomposition or By-products:</b>	Silica will dissolve in hydrofluoric acid and produce a corrosive gas – silicon tetrafluoride.
<b>Hazardous Polymerization:</b>	Will not occur.

#### 11. TOXICOLOGICAL INFORMATION

##### 1. SILICOSIS

The major concern is silicosis, caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms: chronic (or ordinary), accelerated, or acute.

##### Chronic or Ordinary Silicosis (often referred to as Simple Silicosis):

It is the most common form of silicosis and can occur after many years of exposure to relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimetre in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability.

Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimetre in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor pulmonale).

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

## 2. CANCER

IARC – The International Agency for Research on Cancer (“IARC”) concluded that there was “sufficient evidence in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources”, and that there is “sufficient evidence in experimental animals for the carcinogenicity of quartz and cristobalite”. The overall IARC evaluation was that “crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)”. The IARC evaluation noted that “carcinogenicity was not detected in all industrial circumstances studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs”. For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 68, “Silica, Some Silicates...” (1997).

NTP – The National Toxicology Program, in its Ninth Annual Report on Carcinogens, classified “silica, crystalline (respirable)” as a known human carcinogen. OSHA – Crystalline silica (quartz) is not regulated by the U.S. Occupational Safety and Health Administration as a carcinogen.

There have been many articles published on the carcinogenicity of crystalline silica, which the reader should consult for additional information; the following are examples of recently published articles: (1) “Crystalline Silica and Lung Cancer; The Problem of Conflicting Evidence”, *Indoor Built Environ*, Volume 8, pp. 121 – 126 (1998); (2) “Crystalline Silica and the risk of lung cancer on the potteries”, *Occupational Environ. Med.*, Volume 55, pp. 779 -785 (1998); (3) “Is Silicosis Required for Silica-Associated Lung Cancer?”, *American Journal of Industrial Medicine*, Volume 37, pp. 252 - 259 (2000); (4) “Silica, Silicosis, and Lung Cancer; A Risk Assessment”, *American Journal of Industrial Medicine*, Volume 38, pp. 8 – 18 (2000); (5) “Silica, Silicosis, and Lung Cancer: A Response to a Recent Working Group Report”, *Journal of Occupational and Environ. Med.*, Volume 42, pp. 704 – 720 (2000).

## 3. AUTOIMMUNE DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of several autoimmune disorders, - scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted; “Occupational Exposure to Crystalline Silica and Autoimmune Disease”, *Environmental Health Perspectives*, Volume 107, Supplement 5, pp. 793 – 802 (1999); “Occupational Scleroderma”, *Current Opinion in Rheumatology*, Volume 11, pp. 490 –494 (1999).

## 4. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: *Occupational Lung Disorders*, Third Edition, Chapter 12, entitled “Silicosis and Related Diseases”, Parkes, W. Raymond (1994); “Risk of pulmonary tuberculosis relative to silicosis and exposure to silica dust in South African gold miners,” *Occupational Environ. Med.*, Volume 55, pp. 496 – 502 (1998).

## 5. KIDNEY DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease. For additional information on the subject, the following may be consulted: “Kidney Disease and Silicosis”, *Nephron*, Volume 85, pp. 14 – 19 (2000).

## 12. ECOLOGICAL INFORMATION

Crystalline silica (quartz) is not known to be eco-toxic; i.e., there is no date which suggests that crystalline silica (quartz) is toxic to birds, fish, invertebrates, microorganisms or plants. For additional information on crystalline silica (quartz), see Sections 9 (physical and chemical properties) and 10 (stability and reactivity) of this MSDS.

## 13. DISPOSAL CONSIDERATIONS

### General:

The packaging and material may be land-filled; however, material should be covered to minimize generation of airborne dust.

<b>RCRA:</b>	Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.
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The above applies to materials as sold by U.S. Silica Company. The materials may be contaminated during use, and it is the responsibility of the user to assess the appropriate disposal of the used material.

#### 14. TRANSPORT INFORMATION

Crystalline silica (quartz) is not a hazardous material for purposes of transportation under the U.S. Department of Transportation Table of Hazardous Materials, 49 CFR §172.101.

Crystalline silica (quartz) is not dangerous for conveyance under international transport regulations ADR, RID, IATA, IMDG, UN, IMO and IATA/ICAO codes.

#### 15. REGULATORY INFORMATION

<b>UNITED STATES (FEDERAL AND STATE)</b>	
<b>TSCA No.:</b>	Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.
<b>RCRA:</b>	Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.
<b>CERCLA:</b>	Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 40 CFR §302.
<b>Emergency Planning &amp; Community Right to Know Act:</b>	Crystalline silica (quartz) is not an extremely hazardous substance under Section 302 and is not a toxic chemical subject to the requirements of Section 313.
<b>Clean Air Act:</b>	Crystalline silica (quartz) was not processed with or does not contain any Class I or Class II ozone depleting substances.
<b>FDA:</b>	Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3)(xxvi).

**National, state, provincial or local emergency planning, community right-to-know or other laws, regulations or ordinances may be applicable – consult applicable national, state, provincial or local laws.**

#### 16. OTHER INFORMATION

The products should not be used for purposes other than those shown on the manufacturer's product labels and technical data sheets. As the specific conditions of use are outside the supplier's control; the user is responsible for ensuring compliance with the relevant legislation in the territory of use.

The information contained in this Material Safety Data Sheet, is based on the current state of knowledge and current state of Legislation. It provides guidance on Health Safety and Environmental aspects of the products, and should not be taken as a guarantee of technical performance or suitability for particular applications.

<b>Approved by:</b>	J. Carey - Group Technical Director.
<b>Approval date:</b>	07/11/2011
<b>Supersedes:</b>	22/10/2010
<b>Number:</b>	MSDS No. 1049

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