1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	Mulcoa® 47/Mulgrain 47		
FORMULA:	Not Applicable - Mixture		
SUPPLIER:	C-E Minerals	MANUFACTURER:	C-E Minerals
ADDRESS:	901 E. Eighth Avenue King of Prussia, PA 19406	ADDRESS:	P.O. Box 37 Andersonville, GA 31711
PHONE:	(610)265-6880	PHONE:	(229)924-7170
EMERGENCY PHONE:	(229)924-7170, After 5PM weekdays, Weekends, and Holidays: (229) 924-2175		

DESCRIPTION: Mulcoa 47 is a calcined kaolin clay composed of approximately 47% alumina. Mulcoa 47 contains 15 to 25% cristobalite combined in a 65% Mullite and 10-20% glass matrix.

2. INGREDIENTS: COMPOSITION/INFORMATION

INGREDIENT	% WEIGHT	PEL-OSHA	TLV-ACGIH	LD 50/LC 50 ROUTE/SPECIES
Calcined Kaolin (Mullite) CAS No.: 1302-93-8 RTECS No.: No Data	65	15 mg/m^3 (total) 5 mg/m^3 (resp.) (as kaolin)	2 mg/m^3 (resp.)*	No Data
Amorphous silica CAS No.: 7631-86-9 (Glass) RTECS No.: VV7310000	10-20	80 mg/m^3/ % SiO_2 or 20 mppcf	10 mg/m^3 (inhalable)* 3 mg/m^3 (resp.)*	No Data
Cristobalite CAS No.: 14464-46-1 RTECS No.: VV7325000	15-25	$^1/_2$[10 mg/m^3/ (%SiO_2 + 2)](resp.) $^1/_2$[30 mg/m^3/ (% SiO_2 + 2)] (total)	0.025 mg/m^3 (resp.)	No Data

* The value is for particulate matter containing no asbestos and < 1% crystalline silica.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Non-flammable gray to white granular material. Inhalation of high concentrations may cause upper respiratory irritation. Particulate matter may scratch the eyes. This product contains crystalline silica (cristobalite). Once inhaled, cristobalite can remain in the lungs causing scarring, stiffening and difficulty breathing. The most common type of silicosis develops following repeated inhalation over time; however inhalation of high dust concentrations may cause short-term (acute) silicosis. Repeated inhalation of crystalline silica can also increase the risks of developing respiratory cancer. Avoid dust creation. Do not inhale dusts from this product. Do not use compressed air or dry sweeping to remove dusts from the work area. Use a vacuum with adequate filtration or wet clean-up methods to remove dusts.

POTENTIAL HEALTH EFFECTS

EYE: Particulate matter may scratch the cornea or cause other mechanical injury to the eye.

SKIN: None anticipated.

INGESTION: Practically non-toxic. Ingestion is not anticipated under normal working conditions.

INHALATION: Inhalation may cause respiratory irritation and coughing. Exposures to very high concentrations of crystalline silica in a short period of time have on rare occasions been reported to cause acute or rapidly-developing silicosis. Acute silicosis can develop 1-2 months following exposure and has caused severe respiratory symptoms and death.

SIGNS AND SYMPTOMS: Scratching or physical damage to the eyes can cause irritation, redness, pain, tear formation, blurred vision, and light sensitivity. Symptoms of silicosis include phlegm, coughing, and characteristic x-rays. The damaged lungs will become increasingly less able to provide the body with oxygen causing tiredness, shortness of breath, decreased capacity to work, and can result in death by cardiac failure or by the destruction of lung tissue. Shortness of breath upon exertion is one of the most common symptom of silicosis and limited chest expansion is the most common physical sign.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Long-term dust exposure may aggravate pre-existing respiratory disease. Persons who develop silicosis have greatly increased risks of developing tuberculosis and workers who are exposed to crystalline silica and smoke have increased risks of lung damage.

CHRONIC: Reported inhalation of respirable cristobalite over a number of years can cause lung disease (silicosis) and increase the risks of developing respiratory cancer. Silicosis is a progressive fibrotic pneumoconiosis which greatly decreases the ability of the lungs to provide oxygen (decreased pulmonary capacity). The disease may progress even if the worker is removed from exposure. The extent and severity of lung injury depends on a variety of factors including particle size, percentage of silica, natural resistance, dust concentration and length of exposure.

Long-term exposure to kaolin dust has caused fibrosis in experimental animals and workers.

POTENTIAL HEALTH EFFECTS (continued)

TARGET ORGANS: Lungs

CARCINOGENICITY: NTP: Yes IARC: Yes (Group 1) OSHA: Yes

IARC and NTP classify respirable crystalline silica as a confirmed or known human carcinogen. Although OSHA has not promulgated a specific standard for crystalline silica, materials that contain ≥ 0.1% crystalline silica should be treated as a confirmed carcinogen for hazard communication purposes (29 CFR 1910.1200).

4. FIRST AID MEASURES

EYE: Flush eyes with lukewarm water for 15 minutes opening and closing eyelids to ensure adequate rinsing. If redness, irritation, pain, or tearing occurs, seek medical attention.

SKIN: Exposure not anticipated.

INHALATION: Immediate effects are not anticipated. If large amounts of dusts are inhaled, , remove to fresh air. If breathing problems occur, a certified professional should administer oxygen or CPR if indicated. Seek immediate medical attention.

INGESTION: None required.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES		
FLASH POINT:	Not Applicable	
FLAMMABLE LIMITS:	LEL: Not Applicable	UEL: Not Applicable
NFPA CLASSIFICATION:		
HEALTH: 0	FLAMMABILITY: 0	INSTABILITY: 0

EXTINGUISHING MEDIA: Any. Use media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARDS: Non-flammable, non-combustible. Product will not burn.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce silica and aluminum oxides.

FIRE FIGHTING INSTRUCTIONS: Firefighters should wear a NIOSH approved full-facepiece self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout or bunker gear.

6. ACCIDENTAL RELEASE MEASURES

Isolate hazard area and deny entry to unauthorized and/or unprotected personnel. Do not walk through or otherwise scatter spilled material. For small spills, clean with a vacuum with a filtration system sufficient to remove and prevent recirculation of crystalline silica (a vacuum equipped with a high-efficiency particulate air (HEPA) filter is recommended). For large spills, use a fine spray or mist to control dust creation and carefully scoop or shovel into clean dry container for later reuse or disposal. DO NOT USE DRY SWEEPING OR COMPRESSED AIR TO CLEAN SPILLS. Appropriate protective equipment including respiratory protection is essential for all clean-up personnel (See Section 8). Completely remove dusts to prevent recirculation of crystalline silica.

7. HANDLING AND STORAGE

Store in dry area in closed containers.Storage and work areas should be periodically cleaned to minimize dust accumulation. Avoid dust inhalation and promulgation. DO NOT use compressed air or dry sweeping to remove dust from work area. Use a vacuum with adequate filtration system to remove dusts. If an appropriate vacuum is unavailable, only wet-clean-up methods should be used (i.e. misting). Moisture should be added as necessary to reduce exposure to airborne respirable silica dust.

Under dusty conditions, employees should wear coveralls or other suitable work clothing. Contaminated clothing must be vacuumed before removal. DO NOT REMOVE dusts from clothing by blowing or shaking. Practice good housekeeping. Wash thoroughly after handling. Change contaminated clothing. Do not reuse until laundered. Do not take silica contaminated clothing home.

Comply with OSHA Hazard Communication Rule 29 CFR 1910.1200, and applicable federal, state, and local worker or community “right to know” laws and regulations during storage, use and disposal of this product. For further information, consult the American Society for Testing and Materials (ASTM) standard practice ASTM E 1132 Revision 99 A, “Standard Practice for Health Requirements Relating to Occupational Exposure to Crystalline Silica”.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY: Under normal working conditions, below acceptable exposure guidelines, none is required. Appropriate respirator selection is dependent upon the magnitude of exposure and must be selected in accordance with 29 CFR 1910.134. For air concentrations above the PEL to 2.5 mg/m^3 crystalline silica, a NIOSH approved full facepiece air-purifying respirator with a HEPA filter or powered air-purifying respirator with a tight-fitting facepiece and HEPA filter may be worn.

SKIN: None required.

EYES: Safety-glasses with side shields or goggles to prevent dust and particles from entering the eye.

ENGINEERING CONTROLS: Enclosed processes used in combination with local exhaust ventilation as necessary to control air contaminants at or below acceptable exposure guidelines. Collection systems must be designed and maintained to prevent the accumulation and recirculation of respirable silica into the workplace.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (continued)

OTHER: Where there is a potential exposure to free silica (cristobalite), the following warnings should be readily visible and posted near entrances or accessways to work areas: WARNING! FREE SILICA WORK AREA. Unauthorized persons keep out. The following warning should be posted within the work area where potential exposure may occur: WARNING! FREE SILICA WORK AREA. Avoid Breathing Dust. May Cause Delayed Lung Injury (silicosis). (NIOSH Criteria Document, Occupational Exposure to Crystalline Silica, pg. 5, 1974)

Medical surveillance program in accordance with "Criteria for a Recommended Standard. . . Occupational Exposure to Crystalline Silica", NIOSH, pp.: 2-4, 1974.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray to white granular material
ODOR:	Odorless
SOLUBILITY IN WATER:	Insoluble
SPECIFIC GRAVITY (H_2O = 1):	2.64
MELTING POINT:	+ 3000 °F (+ 1650 °C)
pH:	6.5-8
% VOLATILE	0
TYPES:	Size – Kiln Run (approx. $^1/_2$ ") to 325 Mesh Powder

10. STABILITY AND REACTIVITY

STABILITY: Stable

REACTIVITY/INCOMPATIBILITY: Silica is incompatible with strong oxidizers (i.e. fluorine, oxygen difluoride, and chlorine trifluoride).

DECOMPOSITION PRODUCTS: Thermal decomposition products will produce silicon dioxide and aluminum oxide.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

EYE: Particulate matter may cause physical injury to the eye.

SKIN: Skin irritation is not anticipated.

INHALATION: Acute silicosis has been reported for exposure to extremely high crystalline silica exposures particularly when the particle size of the dust is very small. Acute silicosis is rapidly progressive with diffuse pulmonary involvement. The disease is often complicated by tuberculosis and can develop several months after the initial exposure with the possibility of death within 1 or 2 years.

INGESTION: Product is relatively non-toxic if ingested.

11. TOXICOLOGICAL INFORMATION (continued)

CHRONIC: Animal studies indicate that cristobalite has a greater potential to produce fibrosis than quartz . Cristobalite produces a more severe response than quartz eliciting diffuse fibrosis rather than nodular. Silicosis may be slowly progressive in the absence of continued exposure.

Kaolinosis exists in both simple and complicated forms. More complicated forms of kaolinosis are more often associated with respiratory symptoms and changes. Crystalline silica exposure appears to enhance the severity of kaolinosis. Data indicates that kaolin has the ability to induce a fibrogenic response in the absence of crystalline silica. Amorphous silica may also have a mild fibrotic effect.

SUBCHRONIC: No Data

OTHER: Silica particles < 10 µm are considered respirable; however, particles retained in the lungs are generally much smaller. Silica particles retained in the human lung have median diameters of 0.5-0.7 µm.

The amount of cristobalite present in Mulcoa 47 which is respirable will vary with different grain sizes. Powdery materials will necessarily have a higher percentage of respirable material than coarse materials.

12. ECOLOGICAL INFORMATION

Mulcoa 47 is a relatively inert material. It does not contain ozone depleting substances and is not expected to exert an ecotoxic effect or bioconcentrate in the food chain.

13. DISPOSAL CONSIDERATIONS

Dispose of according to applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

U.S. Department of Transportation (DOT): Not Classified

15. REGULATORY INFORMATION

CANADIAN WHMIS: D2A, D2B

EPCRA Section 302 (EHSs): This product does not contain ingredients subject to reporting requirements of 40 CFR Part 355, Appendices A and B (Extremely Hazardous Substances).

CERCLA, Section 304: This product does not contain ingredients subject to state and local reporting under Section 304 of SARA Title III as listed in 40 CFR Part 302, Table 302.4

SARA 313 REPORTING REQUIREMENTS: This product does not contain ingredients subject to the reporting requirements of Section 313 SARA, and Section 6607 of the Pollution Prevention Act:

15. REGULATORY INFORMATION (continued)

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and by definition meets the requirements of the following category:

Chronic Health Hazard

CALIFORNIA PROPOSITION 65: This product contains crystalline silica, an ingredient known to the State of California to cause cancer.

TSCA (Toxic Substances Control Act): All ingredients contained in this product are on the TSCA inventory.

16. OTHER INFORMATION

Revision Date:	5/7/98 added Calif.Proposition 65 information and TSCA information. 10/3/00 reissued with no changes 8/27/01 updated new area code for manufacturing facility. 8/15/03 Health and safety review and update

KEY:

ACGIH:	American Conference of Governmental Industrial Hygienists
CAS:	Chemical Abstracts Service
(C):	Ceiling Limit
DOT:	Department of Transportation
IARC:	International Agency for Research on Cancer
MSHA:	Mine Safety and Health Administration
NFPA:	National Fire Protection Association
NIOSH:	National Institute for Occupational Safety and Health
NTP:	National Toxicology Program
OSHA:	Occupational Safety and Health Administration
PEL:	Permissible Exposure Limit
SARA:	Superfund Amendment and Reauthorization Act
TLV:	Threshold Limit Value

DISCLAIMER

Although reasonable care has been taken in the preparation of the information contained herein, C-E Minerals extends no warranties, makes no representation and assumes no responsibility as to the accuracy of suitability of such information for application to purchaser's intended purposes or for consequences of its use.