

MATERIAL SAFETY DATA SHEET

Section 1 - IDENTIFICATION

Product Name: Cement Kiln Dust

CAS Reg. No.: 68475-76-3

Chemical Name and Synonyms: Kiln Dust, CKD, Flue Dust, Stack Dust, By-pass Dust, BPD

MSDS Information: This Material Safety Data Sheet was produced in May 2010 and replaces any prior versions. This MSDS covers many types of kiln dust with various combinations and concentrations of the constituents and hazardous ingredients listed below.

Chemical Family: Cement Kiln Dust (CKD) is a by-product from the manufacturing of Portland Cement that contains calcium compounds; calcium silicate compounds; other calcium compounds containing iron and aluminum; and other inorganic compounds generated in the cement manufacturing process. These compounds include various combinations and concentrations of the following constituents.

CaCO ₃	Calcium Carbonate	CaO	Calcium Oxide
SiO ₂	Silicon Dioxide	Al ₂ O ₃	Aluminum Trioxide
K ₂ SO ₄	Potassium Sulfate	KCl	Potassium Chloride
Na ₂ SO ₄	Sodium Sulfate	CaSO ₄	Calcium Sulfate
Fe ₂ O ₃	Ferrous Trioxide	MgO	Magnesium Oxide

Informational Phone Numbers: (610) 837-6725

Emergency Contact Information: (800)-424-9300 Chemtrec

MSDS Prepared By: Essroc MSDS Development Committee
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May 6, 2014

Section 2 - COMPONENTS

Hazardous Ingredients:

Component	CAS No.	OSHA PEL (8-hour TWA)	ACGIH TLV	Other Information
Portland Cement Kiln Dust (100%)	68475-76-3	NA	NA	NA
Calcium Carbonate (10 – 80%)	1317-65-3	15 mg total dust/m ³ 5 mg respirable dust/m ³	10 mg/m ³	IDLH: Not Determined LD ₅₀ : No Data
Calcium Oxide (0 - 25%)	1305-78-8	5 mg total dust/m ³	2 mg/m ³	LD ₅₀ : 3059 mg/kg mouse intraperitoneal
Crystalline Silica (< 0.3 – 9%)	14808-60-7	For mineral dusts containing crystalline silica: (10 mg respirable dust/m ³)/(%SiO ₂ + 2) (30 mg total dust/m ³)/(%SiO ₂ + 2)	0.025 mg/m ³ respirable	IDLH: 50 mg/m ³ (twa) LD ₅₀ : ipr rat LD Lo 400 mg/kg
Potassium Chloride (0 – 20%)	7447-40-7	PNOR 15 mg total dust/m ³ 5 mg respirable dust/m ³	10mg/m ³ 3 mg/m ³ respirable	LD ₅₀ : 2600 mg/kg oral rat
Notes:				

Trace Elements: Cement Kiln Dust is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of naturally occurring potentially harmful chemicals might be detected during chemical analysis. Trace constituents may include compounds of arsenic, cadmium, chromium, nickel, and lead.

Section 3 - HAZARDS IDENTIFICATION

Emergency Overview:

Cement Kiln Dust is a light gray powder that poses little immediate hazard. A single short term exposure to the dry powder is not likely to cause serious harm. However, exposure of sufficient duration to wet cement kiln dust can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns, including third degree burns. The same type of tissue destruction can occur if wet or moist areas of the body are exposed for sufficient duration to dry cement kiln dust.

Potential Health Effects:

Relevant Routes of Exposure:

Eye contact, skin contact, inhalation and ingestion.

Effects resulting from eye contact:

Exposure to airborne dust may cause immediate or delayed irritation or inflammation.

Eye contact by larger amounts of dry powder or splashes of wet cement kiln dust may cause effects ranging from moderate eye irritation to chemical burns and blindness. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

Effects resulting from skin contact:

Discomfort or pain cannot be relied upon to alert a person to hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly contact with wet cement kiln dust. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Exposure to dry cement kiln dust may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation or other conditions. Dry cement kiln dust contacting wet skin or exposure to moist or wet cement kiln dust may cause more severe skin effects including thickening, cracking, or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (caustic) chemical burns.

Some individuals may exhibit an allergic response upon exposure to cement kiln dust, possibly due to trace amounts of chromium. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with cement kiln dust.

Effects resulting from inhalation:

Cement kiln dust may contain trace amounts of free crystalline silica. Prolonged exposure to airborne free crystalline silica may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or other diseases. (also see "Carcinogenic potential" below.)

It may also aggravate other lung conditions. Exposure to cement kiln dust may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

Effects resulting from ingestion:

Although ingestion of small quantities of cement kiln dust are not known to be harmful, ill effects are possible especially if larger quantities are consumed. Cement kiln dust should not be eaten.

Carcinogenic potential:

Cement kiln dust is not listed as a carcinogen by the National Toxicology Program (NTP), International Agency for Research (IARC) or the Occupational Safety and Health Administration (OSHA). However, CKD contains crystalline silica and trace amounts of hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

Medical conditions which may be aggravated by inhalation or dermal exposure:

Pre-existing upper respiratory and lung diseases.

Unusual (hyper) sensitivity to hexavalent chromium (chromium⁺⁶) salts.

Section 4 - FIRST AID

Eyes: Immediate flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes including under lids, to remove all particles. Call physician immediately.

Skin: Wash skin with cool water and pH-neutral soap or a mild detergent intended for use on skin. Seek medical treatment in all cases of prolonged exposure to wet cement kiln dust, cement kiln dust mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement kiln dust.

Inhalation of Airborne Dust: Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. ("Inhalation" of gross amounts of cement kiln dust requires immediate medical attention.)

Ingestion: Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

Section 5 - FIRE AND EXPLOSION DATA

- Flash Point.....None
- Lower Explosive Limit.....None
- Upper Explosive Limit.....None
- Auto ignition temperature..... Not combustible
- Extinguishing media.....Not combustible
- Hazardous combustion products.....None
- Unusual fire and explosion hazards.....None
- Special fire fighting procedures..... None*

**Although cement kiln dust poses no fire-related hazards, a self-contained breathing apparatus is recommended to limit exposure to combustion products when fighting any fire.*

Section 6 - ACCIDENTAL RELEASE MEASURES

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8.

Scrape up wet material and place in appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash cement kiln dust down drains.

Dispose of waste material according to local, state, and federal regulations.

Section 7 - HANDLING AND STORAGE

Keep cement kiln dust dry until used. Normal temperatures and pressures do not affect the material. Promptly remove dusty clothing or clothing which is wet with cement fluids and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures or fluids.

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Skin protection: Prevention is essential to avoid potentially severe skin injury. Avoid contact with unhardened (wet) cement kiln dust products. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened cement kiln dust products might occur, wear impervious clothing and gloves to eliminate skin contact. Where required, wear boots that are impervious to water to eliminate foot and ankle exposure.

Do not rely on barrier creams; barrier creams should not be used in place of gloves.

Periodically wash areas contacted by dry or wet cement kiln dust by wet cement or concrete fluids with a pH neutral soap. Wash again at the end of the work. If irritation occurs, immediately wash the affected area and seek

treatment. If clothing becomes saturated with wet concrete, it should be removed and replaced with clean dry clothing.

Respiratory protection: Avoid actions that cause dust to become airborne. Use local or general ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA-approved (under 30 CFR 11) or NIOSH-approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation. (Advisory: Respirators and filters purchased after July 10, 1998, must be certified under 42 CFR 84)

Ventilation: Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye protection: When engaged in activities where cement kiln dust or wet cement kiln dust or concrete could contact the eye, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with wet cement kiln dust or fresh cement products.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance..... Gray or white with powder
Odor..... No distinct odor
Physical state..... Solid (powder)
pH (as per EPA 9045 procedure)..... 11.4 to 13.2
Solubility in water..... 2 to 20%)
Vapor pressure..... Not applicable
Vapor density..... Not applicable
Boiling point..... Not applicable (i.e., >1000 deg. C)
Melting point..... Not applicable
Specific gravity (H₂O = 1.0)..... 2.8
Evaporation Rate..... Not applicable
Freezing Point..... Not Applicable
Coefficient of oil to water distribution..... Not Applicable

Section 10 - STABILITY AND REACTIVITY

Stability: Stable

Conditions to avoid: Unintentional contact with water.

Incompatibility: Wet cement kiln dust is alkaline. As such it is incompatible with acids, ammonium salts and aluminum metal.

Hazardous decomposition: Will not spontaneously occur. Adding water results in hydration and produces (caustic) calcium hydroxide.

Hazardous polymerization: Will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

Route of Entry.....Section 3
Effects of acute exposure to product.....Section 3
Effects of chronic exposure to product.....Section 3
Exposure Limits.....Section 2
Irritancy of product.....Section 3
Sensitization to product.....Section 3
Carcinogenicity.....Section 3
Reproductive Toxicity.....Not Applicable
Teratogenicity.....Not Applicable
Mutagenicity.....Not Applicable
Toxicologically synergistic products.....Section 3, Section 16

For a description of available, more detailed toxicological information, call one of the informational phone numbers listed at the end of Section 1.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity: No recognized unusual toxicity to plants or animals.

Relevant physical and chemical properties: See sections 9 and 10.

Section 13 - DISPOSAL

Dispose of waste material according to local, state, and federal regulations. (Since cement kiln dust is stable, uncontaminated material may be saved for future use.)

Dispose of bags in an approved landfill or incinerator.

Section 14 - TRANSPORTATION DATA

Hazardous materials description/proper shipping name: Cement kiln dust is not hazardous under U.S. Department of Transportation (DOT) regulations.

Hazard class: Not applicable.

Identification number: Not applicable

Required label text: Not applicable.

Hazardous substances/reportable quantities (RQ): Not applicable

Section 15 - OTHER REGULATORY INFORMATION

Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200: Cement kiln dust is considered a "hazardous chemical" under this regulation, and should be part of any hazard communication program.

Status under CERCLA/Superfund, 40 CFR 117 and 302: Not Listed

Hazard Category under SARA TITLE III, Sections 311- 312: Cement kiln dust qualifies as a "hazard substance" with delayed health effects.

Status under SARA Title III, Section 313: This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 in concentrations above de minimis levels.

Toxic Substance Control Act (TSCA): Some substances in cement kiln dust are on the TSCA inventory list.

Status under the Federal Hazardous Substances Act: Cement kiln dust is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under Canadian Environmental Protection Act: Not listed.

Status under WHMIS: Cement kiln dust is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class E - Corrosive material) and is therefore subject to the labeling and MSDS requirements of the Workplace Hazardous Materials Information System (WHMIS).

SECTION 16 - OTHER INFORMATION

Abbreviations:

ACGIH	American Conference of Government Industrial Hygienists
ASTM	American Society of Testing Materials
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
CKD	Cement Kiln Dust
DOT	Department of Transportation
IARC	International Agency for Research
m ³	cubic meter
mg	Milligram
mm	millimeter
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
RQ	Reportable Quantities
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TWA	Time Weighted Average
URT	Upper Respiratory Tract
WHMIS	Workplace Hazardous Material Information System

Other important information:

Cement kiln dust should only be used by knowledgeable persons. A key to using the product safely requires the user to recognize that cement kiln dust chemically reacts with water, and that some of the intermediate products of this reaction (that is, those present while cement kiln dust is "setting") pose a far more severe hazard than does cement kiln dust itself.

While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards of cement kiln dust as it is commonly used, the sheet cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with cement kiln dust to produce cement kiln dust products. Users should review other relevant material safety data sheets before working with this cement kiln dust or working on cement kiln dust products, for example non-ASTM cements and a soil stabilization ingredient.

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