

MATERIAL SAFETY DATA SHEET
JANUARY 2011

SECTION I – PRODUCT IDENTIFICATION

PRODUCT NAME: CHROMITE, CHROME ORE

PRODUCT NUMBER: N/A

PRODUCT ID: AM017

SYNONYMS: Iron Chromite, Chromite, Chromite Ore, Chrome Ore

CAS NUMBER: 1308-31-2

MSDS NUMBER: AMCHROMITE

DESCRIPTION: Chromite is a mineral compound of a natural oxide of ferrous iron and chromium, with varying amounts of magnesium and aluminum substituting for the iron and chromium respectively. It has the general formula of $(\text{Fe,Mg})\text{O}^*(\text{Cr,Fe,Al})_2\text{O}_3$.

HMIS (NPCA)	
HEALTH	2
FLAMMABILITY	0
REACTIVITY	0
PERSONAL PROTECTION	E

SECTION II – COMPOSITION

COMPONENT	SYNONYMS	CAS#	% BY WT
Chrome Ore Cr_2FeO_4 or $\text{Cr}_2\text{O}_3^{**}$	Chromite, Ferrochromite (III), Chromite (Cr_2FeO_4), Chromite Mineral, Iron Chromite	1308-31-2	100

Notes:

****Typical Chemical analysis (Wt.%):** SiO_2 =1-5, FeO = 15-25, Al_2O_3 =10-20, MgO =10-20, CaO =0-1, Cr_2O_3 =35-45. The oxides shown in the "Typical Chemical Analysis" do not exist as free, uncombined oxides, but in complex mineralogical combinations.

SECTION III – HEALTH HAZARD DATA

COMPONENT	CAS#	% BY WT	OSHA PEL [mg/m ³]	OSHA CEILING [mg/m ³]	ACGIH TLV [mg/m ³]	ACGIH STEL [mg/m ³]	LISTED CARCINOGEN (Y/N)		
							NTP	IARC	OSHA
Chrome Ore Cr_2FeO_4 or Cr_2O_3	1308-31-2	100	1 (as Cr)	N/A	0.05 (as Cr)	N/A	N	Y ²	N

Notes:

T = Total dust: R = Respirable dust: F = Fume

- 1) Exposure limits listed for each ingredient is for exposure to dust that may be generated during product transfer and handling.
- 2) IARC Group 3: Not classifiable as to carcinogenicity to humans.

MATERIAL SAFETY DATA SHEET
JANUARY 2011

EMERGENCY OVERVIEW: Not a fire or spill hazard. Low toxicity: dry dust is a nuisance particulate. Generally, health effects are provided for exposure to dust that may be generated during product transfer and handling.

POTENTIAL HEALTH EFFECTS:

PRIMARY ROUTE OF EXPOSURE: Inhalation

RELEVANT ROUTE OF EXPOSURE:

EYE CONTACT: Contact with particulate may cause slight to moderate eye irritation. Abrasive action of dust particulate can damage eye.

SKIN CONTACT: Prolonged or repeated contact may cause slight to moderate skin irritation.

INHALATION: Overexposure by inhalation of airborne particulate, dust or fumes is irritating to the nose, throat and respiratory tract. Inhalation of excessive levels of dust or fumes may be harmful.

INGESTION: Ingestion is an unlikely route of exposure; no hazard in normal industrial use. Small amounts (< tablespoon) swallowed during normal handling operations are not likely to cause injury. However, if ingested in sufficient quantity may cause injury such as gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, abdominal pain and diarrhea.

TARGET ORGANS: Respiratory system, eyes.

ACUTE EFFECTS OF EXPOSURE: Excessive, short-term exposure to airborne mineral dusts and particulate may cause upper respiratory and eye irritation.

CHRONIC EFFECTS OF EXPOSURE: Excessive, short-term exposure to airborne mineral dusts and particulate may contribute to the development of bronchitis, reduced breathing capacity, and may lead to the increased susceptibility to lung disease.

SIGN AND SYMPTOMS OF EXPOSURE: (Dust) tearing of the eyes, burning sensation in the throat, cough, chest discomfort.

MATERIAL SAFETY DATA SHEET
JANUARY 2011

MEDICAL CONDITIONS GENERALLY KNOWN TO BE AGGRAVATED BY EXPOSURE: The excessive inhalation to mineral dust may aggravate pre-existing chronic lung conditions such as, but not limited to, bronchitis, emphysema and asthma.

REPRODUCTIVE HAZARDS: Not a hazard.

POTENTIAL ENVIRONMENTAL EFFECTS: Derived from natural ores; no adverse environmental effects known. However, prevent spilled product from entering streams, water bodies, and wastewater systems. This material is used as an agricultural product.

SECTION IV – FIRST AID

EMERGENCY AND FIRST AID PROCEDURES:

EYES: Flush thoroughly with clean, flowing, lukewarm water (low pressure) for 15 minutes. If irritation persists, contact a physician.

SKIN: Wash with mild soap and water to remove any dust adhering to skin. A commercially available hand lotion may be used to treat dry skin areas. If skin has become cracked, take appropriate action to prevent infection and promote healing. If irritation persists, contact a physician.

INHALATION: Leave the area of dust exposure and remain away until coughing or other symptoms subside. If not breathing, give artificial respiration or give oxygen by trained personnel. If respiratory symptoms persist, contact a physician.

INGESTION: Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious, give 1-2 glasses of milk. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel, since particles may be aspirated into the lungs. Seek immediate medical attention.

NOTE TO PHYSICIANS: None

SECTION V – FIRE FIGHTING METHODS

FLAMMABLE PROPERTIES: This material will not burn. No unusual fire or explosion hazards.

EXTINGUISHING MEDIA: Use extinguishing media appropriate to combustibles in the surrounding area.

MATERIAL SAFETY DATA SHEET
JANUARY 2011

PROTECTION FOR FIREFIGHTERS: Wet materials should be kept out of eyes and off skin. As in any fire, wear self-contained breathing apparatus pressure demand MSHA/NIOSH (approved or equivalent) and full protective gear. Material does not give off toxic fumes in a fire unless molten.

SECTION VI – ACCIDENTAL RELEASE MEASURES

CONTAINMENT: Product is a dry solid (granular or powder) and not readily soluble in water. However, prevent spilled product from entering streams, water bodies and wastewater systems.

CLEANUP: Vacuum or sweep up dry material and place in a container for reuse. Avoid creating excessive airborne dust. Cleanup personnel need to wear approved respiratory protection (air purifying or air supplying), gloves, long sleeved clothing and goggles to prevent irritation from contact and inhalation.

COLLECTION: If possible, collect and reuse spilled product.

REPORTING: *See SECTION XV: Regulatory Information*

EVACUATION: Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

SECTION VII – HANDLING AND STORAGE

HANDLING: Minimize dust generation and accumulation. Avoid breathing dust. Avoid contact with skin and eyes.

STORAGE: Store in a cool, dry area. Keep container closed when not in use.

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limits listed in *SECTION II*.

MATERIAL SAFETY DATA SHEET
JANUARY 2011

PERSONAL PROTECTIVE EQUIPMENT:

EYE AND FACE PROTECTION: Corrosive to eyes. Wear protective safety goggles when dust generation is likely.

SKIN PROTECTION: Wear clothing sufficient to cover the skin, safety shoes and leather gloves for hand protection against dry material.

RESPIRATORY PROTECTION: Use NIOS/MSHA approved respiratory protection (air purifying or air supplying) when concentrations are above exposure limit value. A respiratory protection program that meets OSHA 29 CFR part 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator.

GENERAL HYGIENE CONSIDERATIONS: Wash thoroughly after using product. Wash contaminated clothing. Wash hands before eating or drinking.

EXPOSURE GUIDELINES: *See SECTION II.*

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Chrome ore is usually black, but does show some variation from iron-black to brownish-black with some brown streaks. Various grades can vary from large pieces down to fine powders.

ODOR: None

PHYSICAL/CHEMICAL PROPERTIES:

BULK DENSITY:	-275 lbs/ft ³	FREEZE POINT:	Solid at STP	% VOLATILE BY VOL:	0% H ₂ O
WATER SOLUBILITY	Insoluable	MELTING POINT:	>3400°F	VAPOR DENSITY:	N/A
PH (10% aqueous slurry)	N/A	BOILING POINT:	N/A	VAPOR PRESSURE:	N/A

SECTION X – STABILITY AND REACTIVITY

STABILITY: Stable under normal conditions.

MATERIAL SAFETY DATA SHEET
JANUARY 2011

CONDITIONS TO AVOID: None under normal conditions.

MATERIALS TO AVOID: Chrome ore can react at high temperature with molten alkalies and alkali vapors forming water-soluble chromium salts.

HAZARDOUS DECOMPOSITION PRODUCTS: None under normal circumstances.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION XI – TOXICOLOGICAL PROPERTIES

COMPONENT	CAS#	RTECS TOXICITY DATE
Chrome Ore Cr_2FeO_4) or Cr_2O_3	1308-31-2	Mutagenic: Human Cytogenetic Analysis, 500 mg/L; Microorganisms-Salmonella typhimurium Test, Tissue Tested: Body Fluid Assay, Dose/plate (+S9); Hamster DNA Inhibition Test, Tissue tested: Kidney, Dose: 500 mg/L; Hamster Cytogenetic Analysis, Tissue tested: Ovary, Dose: 5 mg/L; Hamster Sister Chromatid Exchange test, Test Tissue: Ovary, Dose: 10 mg/L.

SECTION XII – ECOLOGICAL INFORMATION

Derived from mineral ores. No data available on any adverse effects of this material on the environment.

SECTION XIII – DISPOSAL CONSIDERATIONS

RCRA: This product, as manufactured, is not a RCRA listed hazardous waste and does not exhibit any characteristics of a hazardous waste, including toxicity (by EPA TCLP method).

DISPOSAL METHOD: This product is generally suitable for landfill disposal. Follow all applicable Federal, State, and local laws, rules and regulations regarding the proper disposal of this material. If this product has been altered or contaminated with other hazardous materials, appropriate waste analysis may be necessary to determine proper method for disposal. A qualified environmental professional should determine waste characterization, disposal and treatment methods for this material in accordance with applicable Federal, State and local laws, rules and regulations.

MATERIAL SAFETY DATA SHEET
JANUARY 2011

SECTION XIV – TRANSPORTATION INFORMATION

USDOT INFORMATION: This product is not regulated by USDOT as a hazardous material (49 CFR part 172.101). No UN code assigned. No placard required for transportation.

LABEL:

CAUTION:

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling and use. Keep in a closed container in a well-ventilated area.

FIRST AID MEASURES:

EYES: Flush thoroughly with clean, flowing, lukewarm water (low pressure) for 15 minutes. If irritation persists, contact a physician.

SKIN: Wash with mild soap and water to remove any dust adhering to skin. A commercially available hand lotion may be used to treat dry skin areas. If skin has become cracked, take appropriate action to prevent infection and promote healing. If irritation persists, contact a physician.

INHALATION: Leave the area of dust exposure and remain away until coughing or other symptoms subside. If not breathing, give artificial respiration or give oxygen by trained personnel. If respiratory symptoms persist, contact a physician.

INGESTION: Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious, give 1-2 glasses of milk. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel, since particles may be aspirated into the lungs. Seek immediate medical attention.

MATERIAL SAFETY DATA SHEET
JANUARY 2011

SECTION XV – REGULATORY INFORMATION

COMPONENT	CAS#	FEDERAL					STATE (right to know)			
		RCRA	CERCLA	SARA	SARA EHS	TSCA	PA	NJ	MA	CA
Chrome Ore Cr ₂ FeO ₄) or Cr ₂ O ₃	1308-31-2	NO	NO	NO	NO	NO	NO	NO	YES	NO

Note: Calumite Company LLC's Chromite Ore is mined from the Transvaal Region of South Africa. This ore and the unreacted ore component of the Chromite Ore processing residue are exempt from the reporting requirements under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA) and Section 6607 of the Pollution Prevention Act of 1990 (PPA). See 66FR24066 for complete citation.

SECTION XVI – OTHER INFORMATION

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM OF THE NATIONAL PAINT & COATINGS ASSOCIATION:

HEALTH:

- 0-NORMAL MATERIAL
- 1-SLIGHTLY HAZARD/SIGNIFICANT IRRITATION
- 2-HAZARDOUS/TEMPORARY INCAPACITATION OR RESIDUAL INJURY
- 3-EXTREME DANGER/SERIOUS OR PERMANENT INJURY
- 4-DEADLY

REACTIVITY:

- 0-STABLE
- 1-UNSTABLE UNDER HEAT OR PRESSURE
- 2-VIOLENT CHEMICAL CHANGE UNDER HEAT OR PRESSURE
- 3-SHOCK AND HEAT MAY DETONATE
- 4-CAPABLE OF DETONATION OR EXPLOSION

FLAMMABILITY:

- 0-WILL NOT BURN
- 1-MUST BE PREHEATED BEFORE IGNITION WILL OCCUR (FLASH POINT > 200°F)
- 2-MUST BE MODERATELY HEATED BEFORE IGNITION WILL OCCUR (FLASH POINT 100°F TO 200°F)
- 3-CAN BE IGNITED UNDER ALMOST ALL AMBIENT TEMPERATURES (FLASH POINT 73°F TO 100°F)
- 4-WILL RAPIDLY OR COMPLETELY VAPORIZE AT ATMOSPHERIC PRESSURE AND NORMAL AMBIENT TEMPERATURES, OR WILL BURN READILY WHEN DISPERSED IN AIR (FLASH POINT 73°F)

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Page 9 of 9

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MATERIAL SAFETY DATA SHEET
JANUARY 2011

PERSONAL PROTECTION:

A-SAFETY GLASSES
B-SAFETY GLASSES+GLOVES
C-SAFETY GLASSES+GLOVES
D-FACE SHIELD+GLOVES+APRON
E-SAFETY GLASSES+GLOVES+DUST RESPIRATOR
F-SAFETY GLASSES+GLOVES+APRON+DUST RESPIRATOR
G-SAFETY GLASSES+GLOVES+VAPOR RESPIRATOR
H-SPLASH GLASSES+GLOVES+APRON+VAPOR RESPIRATOR
I-SAFETY GLASSES+GLOVES+VAPOR RESPIRATOR+DUST RESPIRATOR
J-SPLASH GLASSES+GLOVES+APRON+VAPOR RESPIRATOR+DUST RESPIRATOR
K-AIR LINE HOOD OR MASK+GLOVES+FULL SUIT BOOTS
X-ASK SUPERVISOR OR SAFETY SPECIALIST FOR HANDLING INSTRUCTIONS

DISCLAIMER:

The data supplied in this material safety data sheet is, to the best of our knowledge and belief, accurate and reliable. The Calumite Company does not warrant or guarantee their accuracy or reliability, and will not be liable for any loss or damage arising out of the use thereof. The information contained herein is offered for the user's consideration, examination and determination of suitability

