

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Names: SPARTAN CA-D (PRAC 7283)

Category: A Refractory Shape

Technical Specification Nos.: TS 17283

Chemical Name: Inorganic Oxide

Company Name:

SNOW SHOE REFRACTORIES, LLC

895 Clarence Road

P.O. Box 276

Snow Shoe, PA 16874 USA

Technical Information: 1-814-387-6811 (USA)
24hr. EMERGENCY ASSISTANCE, (CHEMTREC) 1-800-424-9300

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SECTION 2. COMPOSITION OF REFRACTORY SHAPE

This product is a fired refractory shape/brick (an article) available in various sizes and shapes. It is composed of the following mineral phases some of which may be present in dust generated by sawing, cutting, or crushing during installation or tear-out.

Table with 5 columns: Ingredient name, CAS Number, Percent, IARC/NTP/OSHA, Exposure Limits. Rows include Aluminum Oxide, Chrome Oxide (Cr2O3), and Quartz (SiO2).

Quartz, a polymorph of crystalline silica, classified by IARC as a "Known Human Carcinogen - Group 1". NTP lists respirable crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens".

SECTION 3. HAZARDS IDENTIFICATION

HMIS

Table with 2 columns: Hazard Category, Rating. Categories include Health Hazard, Flammability Hazard, Reactivity Hazard, and Personal Protection.

EMERGENCY OVERVIEW:

A green, fired refractory shape/brick ready for installation. Slight health risk from inhalation of dust generated during installation (sawing/crushing). Not a fire, spill or environmental hazard.

Target organs: Upper Respiratory System

Primary route(s) of entry: Inhalation

ACUTE EFFECTS

- Eye contact: Dust particulate is a physical irritant.
Skin contact: Physical abrasion.
Inhalation: Inhalation of airborne particulate from sawing or crushing may irritate upper respiratory system.
Ingestion: An unlikely route of exposure. If ingested in sufficient quantity, may cause gastrointestinal disturbances.

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HAZARD IDENTIFICATION continued from page 2

CHRONIC EFFECTS

Dust which may be generated from sawing, or crushing product during installation and from after service tear-out may contain free/crystalline silica. The prolonged inhalation (usually years) of mineral dusts containing free/crystalline silica may result in the development of a disabling pulmonary fibrosis known as silicosis; a progressive, incapacitating and sometimes fatal lung disease. IARC has classified crystalline silica as a "Known Human Carcinogen - Group 1". NTP lists respirable crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens". See Section 16 for safe "Removal After Service Precautions".

SECTION 4. FIRST AID MEASURES

Eye contact: Flush eyes, including under the eyelids, with large amounts of water. If irritation persists, seek medical attention.
Skin contact: Wash affected areas with mild soap and water.
Inhalation: Remove victim to fresh air. If not breathing, give artificial respiration. Get immediate medical attention.
Ingestion: Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious, give 1-2 glasses of water or 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.

SECTION 5. FIRE FIGHTING MEASURES

NFPA code: Flammability: 0, Health: 0, Reactivity: 0, Special: 0.
Flash point: Not Combustible
Hazardous Decomposition Products: None
Extinguishing media: No special instructions or conditions.
Firefighting instructions: Firefighters should wear NIOSH-approved, positive pressure, self-contained breathing apparatus and full protective clothing where appropriate.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Spill procedures: Product is not a spill nor environmental hazard.

SECTION 7. HANDLING AND STORAGE

Storage: No special storage instructions.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering controls: Provide sufficient ventilation, in both volume and air flow patterns, to control dust concentrations below allowable exposure limits.
Personal protective equipment: The use of eye protection, gloves and long sleeve clothing is recommended.
Respiration protection: Provide workers with NIOSH approved respirators in accordance with requirements of 29 CFR 1910.13 for level of exposure incurred.
Hygienic Practices: Avoid contact with skin, eyes and clothing. After handling this product, wash hands before eating or drinking.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: These fired refractory shapes are green in color and available in various sizes and shapes; odorless.
Boiling Point: Not Applicable
Melting Point: >2900°F (<1590°C)
Water Solubility: 0 (Insoluble)
Ph (10% aqueous slurry): Not Applicable
Specific Gravity(g/cc): Mixture
Bulk Density(g/cc): 2.62
% Volatile by volume: 0
Evaporation rate: Not applicable

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SECTION 10. STABILITY AND REACTIVITY

Hazardous Polymerization: Will not occur

Chemical Incompatibilities: None

Hazardous Decomposition Products: None

SECTION 11. TOXICOLOGICAL INFORMATION

Aluminum Oxide CAS#1344-28-1 Toxic and Hazard Review (Sax): an experimental tumorigen and neoplastigen by implant. Inhalation of finely divided particles may cause lung damage (Shaver's disease). TOXICITY DATA: ipl-rat TDLo:90mg/kg:ETA; imp-rat TDLo:200 mg/kg:NEO; imp-rat TD :200 mg/kg:ETA.

Chromic (III) Oxide CAS#130838-9. Chromic oxide fed to rats in dosage up to 5% for two years produced no treatment related effects (NOEL). Chromic oxide is not listed as a carcinogen by NTP, IARC or OSHA.

Quartz CAS# 14808-60-7. Toxic and Hazard Review (Sax): Experimental poison by intratracheal and intravenous routes. An experimental carcinogen, tumorigen, and neoplastigen. CLASS OF COMPOUND(RTECS): Tumorigen; Mutagen; Human data. Human systemic effects by inhalation: cough, dyspnea, liver effects. Listed by IARC as a "known human carcinogen" Group 1. Listed by NTP. No LD₅₀ in RTECS.

Toxicity Data:Inhalation human: TCLo 16 million particles per cubic centimeter per 8 hours per 17.9 Years-Intermittent:Pulmonary system effects;
Inhalation-human LCLo: 300 micrograms/m³ per 10 years-intermittent: liver.
Other species toxicity data (NIOSH RTECS): intravenous-rat LDLo: 90 mg/kg; intraperitoneal-rat LDLo: 200 mg/kg;intravenous-mouse LDLo: 40 mg/kg; intravenous-dog LDLo: 20 mg/kg.

Balance of Ingredients: No LD₅₀ or LC₅₀ found for oral, dermal, or inhalation routes of administration.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicological/Chemical Fate Information:

No data available on any adverse effects of this material on the environment.

SECTION 13. DISPOSAL INFORMATION

Waste Management/Disposal: This product, as manufactured, does not exhibit any characteristics of a hazardous waste. As shipped, this material does not exceed the RCRA extraction procedure limit of 5 ppm for total soluble chromium. It is suitable for landfill disposal. However, process environments, especially extremely high temperatures may cause chemical reactions which produce substances which will exceed the RCRA limit for soluble chrome, or debris generated during installation, maintenance or tear-out procedures may be contaminated with other hazardous materials. Therefore, testing of waste/debris should be performed to determine the proper waste classification. Waste characterization and disposal/treatment methods should be determined by a qualified environmental professional in accordance with applicable federal, state and local regulations.

SECTION 14. TRANSPORT INFORMATION

US Department of Transportation: Not regulated by DOT as a hazardous material. No hazard class, no label or placard required, no UN or NA number assigned.

Canadian TDG Hazard Class & PIN: Not regulated

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SECTION 15. REGULATORY INFORMATION

Product or components of mixture regulated under following lists:

SARA TITLE III:

- Section 302: No (Extremely Hazardous Substances)
Section 304: No (Emergency Release)
Section 311: Yes, Acute and Chronic Effects- MSDS
Section 312: Yes, Tier I/II
Section 313: Yes. The product contains 10.0% Chrome (III) Oxide CAS#1308-38-9 which is listed and reportable under requirements of SARA TITLE III Section 313.

Chromic oxide is listed on these additional regulatory lists:

Federal Water Pollution Control Act, Clean Water Act, 40 CFR116
Chromic oxide is covered by the CWA as CHROMIUM and COMPOUNDS.
Clean Air Act, 40 CFR 60, Section III, 40 CFR 61 Section 112.
Chromic oxide is covered by the CAA as CHROMIUM and COMPOUNDS
OSHA Hazard Communication Rule 29 CFR 1910.1200
Under this rule, chromic oxide is hazardous. ACGIH TLV:TWA 0.5 mg/m3 as /Cr/.
CERCLA, 40 CFR 117.302
Chromic oxide does not have a listed reportable quantity (RQ).
Canadian CN1 and state list MALCE and Calif. Prop. 65.

CERCLA Hazardous Substance List, RQ: No

TSCA: All substances in this product are listed in the Chemical Substance Inventory of the Toxic Substances Control Act.

California Proposition 65: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive toxins.

SECTION 16. OTHER INFORMATION

REMOVAL AFTER SERVICE/TEAR-OUT PRECAUTIONS:

Because of the possible presence of crystalline silica in used refractory debris, particular care should be exercised during tear-out to minimize the generation of dust. Adherence to proper methods of dust suppression and control is imperative. The following precautions should be taken during tear-out.

- 1. Employees should be apprised of the hazards and proper conditions and precautions for safe use or exposure.
2. Approved respirators, in accordance with requirements of 29 CFR 1910.134, should be used for dust levels above 0.05mg/m3 respirable crystalline silica.
3. Dust generation should be minimized by the use of dust control equipment or water spray.
4. Wear protective clothing and vacuum clean prior to removing clothing.
5. Where there is a possibility of exposure to dust containing respirable crystalline silica, the following warning should be posted.

Table with 2 columns: FREE SILICA WORK AREA, AVOID BREATHING DUST. Row 2: DUST MAY CAUSE DELAYED LUNG INJURY(SILICOSIS)

ACRONYMS AND REFERENCES USED IN PREPARATION OF MSDS':

- ACGIH: American Conference of Governmental Industrial Hygienists
CAS#: CAS Registration Number is an assigned number to identify a material. CAS stands for Chemical Abstracts Service.
CERCLA: Comprehensive Environmental Response, Compensation & Liability Act
EPCRA: Emergency Planning and Community Right-to-Know Act of 1986
HMIS™: Hazardous Materials Identification System (National Paint & Coatings Association)
IARC: International Agency for Research on Cancer

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ACRONYMS continued from page 5

MSHA: Mine Safety and Health Administration
mg/m³: Milligrams per cubic meter
NIOSH: National Institute for Occupational Safety and Health
NFPA: National Fire Protection Association
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit (OSHA)
REL: Recommended Exposure Limit (NIOSH)
SARA: Superfund Amendments and Reauthorization Act
TITLE III: Emergency Planning and Community Right To Know Act
Section 302: Extremely Hazardous Substances
Section 304: Emergency Release
Section 311: *Community Right-to-Know*, MSDSs or List of Chemicals
Section 312: *Community Right-to-Know*, Inventories & Locations, (Tier I/II)
Section 313: Toxic Chemicals, Toxic Chemical Release Reporting, Form R
TLV: Threshold Limit Values (ACGIH)
TWA: Time Weighted Average
29CFR1910.134: OSHA Respiratory Protection Standard

REFERENCES:

Sax, N. Irving: Dangerous Properties of Industrial Materials, Ninth Edition, Van Nostrand Reinhold Co., Inc., 1996.
Kirk, R. and Othmer, D., Encyclopedia of Chemical Technology, Third Edition, Wiley-Interscience, New York, NY 1982.
Clansky, K.B., Suspect Chemicals Sourcebook, 1992-2 Edition, Roytech Publications, Bethesda, Maryland.
Sax, N.Irving and Lewis, R.J. Hawley's Condensed Chemical Dictionary, Eleventh Ed., Van Nostrand Reinhold Co., Inc., NY
Manufacturers/Suppliers, Material Safety Data Sheets on Raw Materials Used
American National Standard for Hazardous Industrial Chemicals - Material Safety Data Sheets - Preparation, American National Standards Institute, Inc. 11 West 42nd St, New York, NY 10036.

Prepared/Revised by: Mark Jacobs
February 15, 2007

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