

MATERIAL SAFETY DATA SHEET FOR GRAPHITE POWDER

TOTAL Lubricants USA Southwest
400 Chisholm Place, Suite 418
Plano, Texas 75075

TOTAL Lubricants USA, Inc.
5 N. Stiles Street
Linden NJ 07036

REVISION DATE
N/A

DATE ISSUED
1-July-2009

Chronic Exposure to natural graphite is associated with the development of pneumoconiosis, a disease of the lungs.
For Quartz: Prolonged inhalation exposure may produce silicosis. Chronic symptoms include cough, dyspnea, wheezing, increased susceptibility to tuberculosis, decreased chest expansion, and repeated nonspecific chest illnesses. Progressive respiratory and cardiopulmonary impairment may be fatal. Chronic inhalation of crystalline silica is a lung cancer hazard.
Aggravation of Pre-existing Conditions: Persons with pre-existing respiratory or cardiopulmonary problems may be more susceptible to the effects of this substance.

INGESTION:

Not expected to require first aid measures. If large amounts were swallowed, give water to drink and get medical advice. Rinse mouth thoroughly with water. Seek medical advice immediately.

Symptoms. Not expected to be a health hazard via ingestion. May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea

FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM): NA

AUTOIGNITION TEMPERATURE: Graphite does not burn or support combustion. If ground to sub-micron sizes, graphite may ignite spontaneously in air.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION:

Health	Flammability	Reactivity
0	1	0

FLAMMABLE OR EXPLOSIVE LIMITS (approximate percent by volume in air):

Estimated values: lower: NO DATA upper: NO DATA

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES:

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water froth may be used to flush spills away from exposure. Minimize breathing gases, vapor, fumes, or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

n/a

"EMPTY" CONTAINER WARNING:

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Empty containers retain residue (liquid or vapor) and can be dangerous. DO NOT PRESSURIZE, WELD, CUT BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged, and returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with government regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

HEALTH AND HAZARD INFORMATION

EXPOSURE LIMIT FOR TOTAL PRODUCT: Monitor data listed in the Components and Hazard Information section.

VARIABILITY AMONG INDIVIDUALS:

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which vary from person to person. As a precaution, exposure to liquids, vapors, mists, or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure):

Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis. Product contacting the eye may cause irritation. Product has a low order of oral and dermal toxicity. Possible aspiration hazard. Induced vomiting may cause aspiration of product into the lungs. (See Emergency First Aid Section).

Airborne Exposure Limits (Applicable workplace exposure levels):

For Graphite (Natural)—CAS 7782-42-5, EC no. 231-955-3:

- ACGIH Threshold Limit Values (TLVs) -
2 mg/m³ (for all forms of graphite except graphite fibers)
- NIOSH Recommended Exposure Limit (REL) -
2.5 mg/m³ for up to a 10-hour workday during a 40-hour workweek.
- OSHA Permissible Exposure Limits (PELs) - TWA 15 ml/m³

For Silica, Crystalline, Quartz (CAS no 14808-60-7, EC no 231-955-3):

- ACGIH Threshold Limit Values (TLVs) -
0.05 mg/m³ (TWA), respirable fraction, A2 - Suspected Human Carcinogen.
- NIOSH Recommended Exposure Limit (REL) -
0.05 mg/m³ (TWA), potential occupational carcinogen.
- OSHA Permissible Exposure Limits (PELs) -
(30mg/m³)/(%SiO₂ + 2), (TWA), total dust;
(10 mg/m³)/(%SiO₂ + 2), (TWA), respirable fraction;
where "%SiO₂" is the percentage of crystalline silica
determined by airborne samples, as defined by 29 CFR 1910.1000, Z-3.

Other Control Measures: Graphite is a conductor of electricity. Exercise caution when handling graphite in areas where contact with electrical circuitry is possible. Use good personal hygiene practices.

PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

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BOILING RANGE:
Sublimes

VAPOR PRESSURE:
<0.0001 mm Hg @ 25°C

SPECIFIC GRAVITY (25°C/25°C):
2.27 (WATER = 1)

VAPOR DENSITY (AIR = 1):
>1

MOLECULAR WEIGHT:
Wide range

PERCENT VOLATILE BY VOLUME:
Negligible

EVAPORATION RATE @ 1 ATM. AND 25°C
(77°F) (n-BUTYL ACETATE = 1):
< 1.0

SOLUBILITY IN WATER @ 1 ATM. and 25°C
(77°F):
Insoluble solid

POUR, CONGEALING OR MELTING POINT:
Melts at 3650 C (6602 F)

FREEZING POINT:
n/e

REACTIVITY

Incompatibilities:

Graphite reacts vigorously with liquid potassium, potassium peroxide and will ignite with chlorine trifluoride and fluorine. If graphite contacts liquid potassium, rubidium, or cesium at 300C, intercalation compounds may be formed. These compounds may explode on contact with water or ignite in air. For Quartz: Reacts with hydrogen fluoride, fluorine, oxygen difluoride, chlorine trifluoride, strong acids, strong bases, and oxidizers.
Conditions to Avoid: Incompatibles.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS:

Fumes, smoke, carbon monoxide, and other decomposition products, in case of incomplete combustion.

CONDITIONS TO AVOID:

Open flames

TOXICITY

ORAL (Acute)	N/E
DERMAL (Acute)	N/E
EYE	N/E
INHALATION (Acute)	N/E
CHRONIC, SUBCHRONIC, ETC.	N/E

Medical Conditions Aggravated by Exposure: Unknown

This product does NOT contain any ingredients identified as carcinogenic by IARC, NTP, or OSHA.

SARA Section 313 Status: This material is not known to contain any chemicals on the SARA Section 313 list at a concentration greater than 1.0 percent or carcinogenic chemical on that list at a concentration greater than 0.1 percent.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

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Slipping hazard—do not walk through spilled material. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

WASTE DISPOSAL METHOD: (Consult federal, state, or local authorities for proper disposal procedures.) Assure conformity with applicable disposal regulations.

PROTECTION AND PRECAUTIONS

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

RESPIRATORY PROTECTION: (Use only NIOSH approved equipment.)

Personal Respirators (NIOSH Approved): A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

PROTECTIVE GLOVES:

Hand and Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Before use, the protective gloves should be tested for its specific work-station suitability (i.e. mechanical resistance, product compatibility and antistatic properties). Adhere to the manufacturer's instructions and information relating to the use, storage, care and replacement of protective gloves. Protective gloves shall be replaced immediately when physically damaged or worn. Design operations to avoid permanent use of protective gloves if possible. Use rubber gloves to provide protection against permeation.

EYE PROTECTION:

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CERCLA HAZARDOUS SUBSTANCES:

Notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. Chemical substances present in this product that may be subject to this statute are: None identified.

U.S. TSCA INVENTORY

All components (graphite and quartz) of this material are listed on the U.S. TSCA Inventory. CAS 7782-45-5 and 14808-60-7.

CALIFORNIA PROPOSITION 65

WARNING: THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

NEW JERSEY RIGHT-TO-KNOW LABEL

Graphite powder

PREPARED BY: Alan Denniston

VP PRODUCT MANAGEMENT

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR MISUSE BEYOND OUR CONTROL, SELLER MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.