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SB 10713
SB 13520

PALABORA AMERICA LTD.
MATERIAL SAFETY DATA SHEET
CRUDE VERMICULITE

IMPORTANT SAFETY NOTICE: The information in the Material Safety Data Sheet relates only to the specific material(s) described herein and does not relate to use in combination with any other material or substance or in any process. We believe that the information contained herein is current as of the date of issue of this Material Safety Data Sheet. *Because the use of this information and these opinions and the conditions of use of this product are not within the control of Palabora America Ltd., it is the user's obligation to determine the conditions of safe use of the product.*

Users of this product should study this Material Safety Data Sheet and become aware of the product hazards and safety information before using the product. Users should also notify their employees, agents, and contractors regarding information contained in this Material Safety Data Sheet and any product hazards and safety information in order to provide safe use of this product.

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Palabora America Ltd. Building 200, Suite 250 1000 Cobb Place Blvd. Kennesaw, GA 30144 Tel: (770) 590-7970	**EMERGENCY TELEPHONE No.:** Chemtrec: 1-800-424-9300
TRADE NAME: Crude Vermiculite	**MSDS NUMBER:** 1026 - Revision 1
CHEMICAL NAME: Hydrated Magnesium-Aluminum-Iron Silicate	**SYNONYMS:** Non-Exfoliated Vermiculite
PREPARED BY: Clayton Group Services	**DATE OF ISSUE/REVISION:** Issued: May 17, 1999 Revised: November 24, 2009

2. INGREDIENTS

Component	CAS #	Percent	ACGIH (TLV)	OSHA (PEL)	Units
Hydrated Magnesium-Aluminum-Iron Silicate (Vermiculite)	1318-00-9	100	Not Est.	Not Est.	Not Est.
Crystalline Silica	14808-60-7	<0.01	0.1 (R)	0.1 (R)	mg/M^3

See Section 11.

ACGIH TLVs are based on 1998 values. All values are 8 hour time weighted averages unless otherwise noted.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Product is tan flakes, granules, or powder with no odor. Dusts may cause irritation of eyes, skin, mucous membranes, and respiratory tract. Wear appropriate personal protective equipment. Keep individuals not involved in the cleanup out of the area. Pick up released product with appropriate implements and return to original container if reusable. If not reusable, place in appropriate containers for disposal. Although the product itself is non-hazardous, material collected during clean up operations may be contaminated and should be treated as hazardous unless specific testing, including TCLP, shows the collected material to be non-hazardous. Product is quite inert and is not expected to present an environmental hazard.

POTENTIAL HEALTH EFFECTS:

Eye: Dusts and particulate matter may cause irritation of the eyes.

Skin contact: Dusts and particulate matter may cause irritation of the skin.

Skin Absorption: Not known to be absorbed through the intact skin.

Ingestion: Not expected to be an important route of entry into the body. Ingestion of large quantities of the product may cause gastric discomfort or distress.

Inhalation: Dusts and particulate matter may cause irritation of the mucous membranes and respiratory tract.

Chronic and Carcinogenicity: No specific long term health effects have been identified for asbestos and silica free vermiculite. See Section 11. As is true of all nuisance or inert particulates, inhalation of high concentrations of vermiculite dusts and/or particulates over prolonged periods of time may cause a benign pneumoconiosis.

Prolonged exposure to respirable crystalline silica (quartz) may cause a progressive, disabling lung disorder (silicosis). Symptoms may include, cough, shortness of breath, wheezing, decrease in pulmonary function, and recurring non-specific pulmonary illnesses. The onset of symptoms, except in cases of massive exposures, is usually gradual over a period of several years and is accompanied by changes in the x-ray picture of the lungs. Crystalline silica has been listed a potential human carcinogen (2A) by the International Agency for Research on Cancer (IARC) and as a substance that can be reasonably anticipated to cause cancer in humans by the National Toxicology program. See Section 11.

Pre-existing lung and skin conditions may possibly be aggravated by exposure to the components of the product.

4. FIRST AID MEASURES

Inhalation: Remove exposed person to fresh air. If breathing is difficult, oxygen may be administered. If breathing has stopped, artificial respiration should be started immediately. Seek medical attention.

Eyes: Flush with tepid water for at least 20 minutes holding the eyelids wide open. Seek medical attention if irritation develops.

Skin: Wash thoroughly with mild soap and water. Seek medical attention if irritation develops. Remove any contaminated clothing and launder thoroughly before reuse.

Ingestion: Not expected to be an important route of entry into the body. If large amounts of the product are ingested, seek medical attention.

5. FIRE FIGHTING MEASURES

FLASH POINT: NA **LEL:** NA **UEL:** NA **AUTO IGN. TEMP.:** NA

Product will not burn. Material in or near fires should be cooled with a water spray or fog if compatible with fire fighting techniques for the other materials involved in the fire.

A self contained breathing apparatus operating in the positive pressure mode and full fire fighting gear should be worn for combating fires.

6. ACCIDENTAL RELEASE MEASURES

Pick up released product with appropriate implements and return to original container if reusable. If not reusable, place in appropriate containers for disposal. Appropriate personal protective equipment cited in Section 8 should be worn during all clean up operations. Although the product itself is non-hazardous, material collected during clean up operations may be contaminated and should be treated as hazardous unless specific testing, including TCLP, shows the collected material to be non-hazardous.

7. HANDLING AND STORAGE

Do not store with or near incompatible materials cited in Section 10. Store in tightly closed containers out of contact with the elements. Appropriate personal protective equipment cited in Section 8 should be worn during handling. Good housekeeping and engineering practices should be employed to prevent the generation and accumulation of dusts. Wet mopping or vacuuming with a unit that contains a HEPA filter is recommended to clean up any dusts that may be generated during handling and processing. See also Section 6.

Wash hands and face thoroughly before eating, drinking or smoking.

8. EXPOSURE CONTROL - PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation should be provided to maintain exposures below the limits recommended for nuisance particulates of 10 mg/M^3 for total particulates and 3 mg/M^3 for respirable particulates. Design details for local exhaust ventilation systems may be found in the latest edition of "Industrial Ventilation: A Manual of Recommended Practices" published by the ACGIH Committee on Industrial Ventilation, P.O. Box 16153, Lansing, MI 48910. The need for local exhaust ventilation should be evaluated by a professional industrial hygienist. Local exhaust ventilation systems should be designed by a professional engineer.

RESPIRATORY: If dusts or particulates are generated during handling or processing and exposures may exceed the limits cited above, use, as a minimum, a NIOSH approved ½ face piece respirator with cartridges approved for particulate matter with an exposure limit of not less than 0.05 mg/M^3. If exposures may exceed 10 times the limits cited in Section 2, consult your respiratory protective equipment supplier or a professional industrial hygienist for selection of the proper equipment. The evaluation of the need for respiratory protection should be made by a professional industrial hygienist.

EYE PROTECTION: Chemical protective goggles are recommended where there is the possibility of eye contact with the product. Safety glasses with side shields are recommended for all other operations.

PROTECTIVE GLOVES: Polymeric gloves are recommended to prevent possible irritation. PVC or similar construction materials are recommended.

GENERAL: A polymeric coated apron or other body covering is recommended where there is a possibility of regular work clothing becoming contaminated with the product. All soiled or dirty clothing and personal protective equipment should be thoroughly cleaned before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE & PHYSICAL STATE: Tan Flakes, Granules, or Powder.

MELT POINT: Approx 2426° F (1300° C)

VAPOR DENSITY (AIR=1): NA

OCTANOL/WATER PARTITION COEFFICIENT: ND

VAPOR PRESSURE: NA

EVAPORATION RATE BuOAC = 1: NA

ODOR: None

SPECIFIC GRAVITY/BULK DENSITY: (Bulk) 0.66-0.96 g/cc

% VOLATILE BY VOLUME: Not Volatile

BOILING POINT: ND

% SOLUBILITY (H_2O): <1

pH: NA

10. STABILITY AND REACTIVITY

STABILITY & POLYMERIZATION: Product is stable. Hazardous polymerization will not occur.

INCOMPATIBILITY (CONDITIONS TO AVOID): Do not store with or near strong acids, or reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: None that are known. Product is stable to at least 2400° F.

SPECIAL SENSITIVITY: Product will undergo an exfoliation reaction with a resultant large increase in volume at approximately 300° F.

11. TOXICOLOGICAL INFORMATION

Analytical studies conducted by the Institute of Occupational Medicine (IOM) in Edinburgh, Scotland indicated that the product does not contain asbestos minerals or crystalline silica at the limits of detection of the analytical methods employed. The reported limit of detection for asbestos minerals was 0.001 % while that for crystalline silica was 0.01 %.

Epidemiology studies cited by the IOM indicate that there is little direct evidence of specific harmful effects from inhalation of vermiculite. These studies focused on miners and processors in South Carolina and in South Africa.

In vitro toxicology studies conducted on aqueous extracts of the product under the auspices of the South African Department of Water Affairs and Forestry in 1998 indicated that the product most probably is not teratogenic or mutagenic. In the studies cited below, a known amount of product was extracted with a liter of distilled water. The resulting extract solution was used to derive the toxicity parameters. The extract was not teratogenic to frog (*Xenopus laevis*) embryos at extract concentrations of 1,000 grams per liter (g/l) and not mutagenic to *Salmonella typhimurium* at concentrations of 2,000 g/l.

12. ECOLOGICAL INFORMATION

In vitro ecotoxicity studies conducted on aqueous extracts of the product under the auspices of the South African Department of Water Affairs and Forestry in 1998 indicated that the product most probably is not toxic to the environment. In each of the ecotoxicity tests cited below, 50 grams of the product were extracted with a liter of distilled water. The resulting solution was used to derive the toxicity parameters. The 48 hour EC_0 and EC_{50} (*Daphnia pulex* lethality) were determined to be >50 milligrams of extract per liter (mg/l). The 72 hour EC_0 and EC_{50} (algal, *Selenastrum capricornutum*, growth inhibition) were determined to be >50 mg/l. The 72 hour EC_0 and EC_{50} (bacterial, *Pseudomonas putida*, growth inhibition) were determined to be >50 mg/l. The 48 hour EC_0 and 48

hour EC_{50} (frog, *Xenopus laevis*, embryo lethality) were determined to be >50 mg/l.

13. DISPOSAL CONSIDERATIONS

As prepared, product is considered non-hazardous. It should be disposed of in an EPA approved landfill in accordance with all local, state, and federal regulations. If used or waste product is disposed of testing, including TCLP, should be conducted to determine hazard characteristics.

Empty containers will contain product residues. Observe proper safety and handling precautions. Do not allow empty containers or packaging to be used for any purpose except to store and ship original product.

14. TRANSPORTATION INFORMATION

Not currently regulated under Department of Transportation regulations.

15. REGULATORY INFORMATION

Vermiculite is not reportable under Section 313 of the Superfund Amendments and Reauthorization Act of 1986.

OSHA Hazard Communication Categories: Irritant, Lung Hazard, Skin Hazard, Eye Hazard.

SARA Hazard Categories: Acute Hazard.

Crystalline silica whose particle size is in the respirable range, <10 microns, has been classified by the State of California as a substance that is known to cause cancer.

Crystalline silica has been listed as an Extraordinarily Hazardous Substance and Carcinogen by the State of Massachusetts.

16. OTHER INFORMATION

Not Est. = Not Established; NA = Not Applicable; ND = Not Determined.

All components of the product are included in the Toxic Substances Control Act (TSCA) inventory.