MATERIAL SAFETY DATA SHEET

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MATERIALS INFORMATION SERVICES

NO. 15A

CHRYSOTILE ASBESTOS

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SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: CHRYSOTILE ASBESTOS

DESCRIPTION: A crystalline serpentine mineral, or layered, hydrated magnesium silicate in fine fiber form (asbestiform). The end of a sliver of this material with a cross-section of 0.1 mm² can show about 20 million tubules (scroll-like fibrils about 0.01 μm diameter) in approximate parallel orientation. It is possible to strip from a fiber bundle very fine chrysotile threads, each an agglomerate of hundreds or thousands of hollow fibrils. (90% of asbestos used is chrysotile.)

OTHER DESIGNATIONS: Asbestos, CAS #001 332 214, GE Material D4E11

SECTION II. INGREDIENTS AND HAZARDS	%	HAZARD DATA
Idealized Chrysotile (unit cell) - $Mg_3Si_2O_5(OH)_4$*	ca 95	8-hr TWA 2 fibers/cc, * Ceiling 10 fibers/cc (>5 μm in length) "Asbestos" Human, inhal. TDLo 1.2 fb/cc for 19 years (Pulmonary effects.

*Impurities include low levels of Mn, Fe^{+2}, Fe^{+3}, and Al in the structure, replacing randomly 4% av. of the Mg atoms. Impurities depend on the mineral source; the unit cell hydroxyl content can also vary with an average of 4.25.

**Current OSHA TLV. OSHA (1975) proposed TLV of 0.5 fb/cc with a Ceiling of 5 fb/cc (15 min. sample). NIOSH (1976) proposed 0.1 fb/cc. ACGIH (1979 Intended Changes List) has retained TLV of 2 fb/cc for chrysotile asbestos. Asbestos is carcinogenic and/or co-carcinogenic for humans!

SECTION III. PHYSICAL DATA

Melting point ---------- Decomposes (see Sect. V)

Vapor pressure ---------- Nil

Water solubility ---------- Insoluble (slowly breaks down in hot water)

Appearance: White, fibrous solid, as long flexible textile fibers down to dust-like powder. [Milled chrysotile asbestos (powder-like) has an aspect ratio (ratio of length/diameter) as high as 50 for most particles.]

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
N/A	N/A	N/A		

This material is not combustible in air. Use extinguishing media as appropriate for the surrounding materials in a fire situation.

PLAINTIFF'S EXHIBIT

ATT-109

SECTION V. REACTIVITY DATA

This material is inert under ordinary room temperature and heated use conditions. It is resistant to heat, but it will decompose and alter its microscopic fiber structure (see Sect. I) above 600 C (1112 F): Chrysotile dehydroxylates at 600-780 C; the "asbestos anhydride" in turn breaks down to mixture of silica (SiO_2) and fosterite (Mg_2SiO_4) at 800-850 C. Above 1000 C (1832 F) magnesium pyroxenes are formed which melt at about 1450 C.

Mineral acids can attack chrysotile and rapidly extract its MgO and H_2O content; it can be decomposed by glacial acetic acid. Hot water slowly breaks down chrysotile. It, like other forms of asbestos, resists strong alkali (5 M NaOH at least up to 100 C).

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SECTION VI. HEALTH HAZARD INFORMATION

TLV 2 fibers/cc >5 um in length (See Sect. II)

As a particulate material, chrysotile asbestos can be irritating to the respiratory tract, skin or eyes. However, the significant industrial hazards arise from excessive dust inhalation with damage requiring years to become evident. Chronic inhalation of high levels of asbestos particles can produce asbestosis, a disabling fibrosis of the lungs which gradually reduces lung capacity and efficiency. (Usually over 4 years is required for a serious condition to develop.) Excessive inhalation can also cause pleural plaques, a thickening of the lung lining. Compliance with TLV is expected to control these hazards.

Cancer can result from excessive inhalation of asbestos particulate, which may require decades to develop. Lung cancer is a special risk to those who smoke cigarettes regularly in addition to having asbestos exposure. Rare mesotheliomas of the pleura and peritoneum (lining around the lungs or abdominal cavity) and possibly cancers of the GI tract and larynx (also smoking related) have been associated with inhalation exposure to asbestos particles. (Crocidolite asbestos has been suggested as the major mesothelioma risk.)

In groups of workers exposed to asbestos, lung cancer death is 3 or 4 times more common than mesothelioma death, and 97.5% of asbestos-related lung cancers occur with those workers who also smoke cigarettes! For non-smokers asbestos exposure increases risk of lung cancer 5X.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel of spills! Exclude all from spill area except trained clean-up personnel who have approved respiratory protection against dust. Provide exhaust ventilation with capture filtration, but do not stir up the dust. Use a wet method or an approved vacuum cleaning system to pick up spills. The techniques used must collect particulate without dispersing dust into the air. Waste must be placed in dust-tight containers or sealed plastic bags for disposal. Label properly!

DISPOSAL: Deposit waste containers in a secured landfill where asbestos will remain buried. Follow Federal, State and local regulations. Also note that chrysotile can be converted-into-non-asbestos waste by heating at high temperature (see Sect. V).

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide exhaust ventilation and capture filtration to remove airborne asbestos particulate from the workplace (as much as possible) without dispersing it into the environment. Isolate work areas (also post signs) where asbestos particulate may occur at excessive levels.

For nonroutine or emergency conditions where excessive dust is present, approved respirators must be used: Single use or re-usable air-purifying respiratory up to 10X TLV; full-facepiece powered air-purifying respirator up to 100X TLV; full-facepiece air-supplied (continuous flow or pressure-demand type) respirator above 100X TLV.

Depending on exposure levels, it may be necessary to provide body-covering work clothes, special vacuuming facilities for clothes and suitable laundering or disposal arrangements, change areas with dual lockering facilities, showers before changing to street clothing after work, etc. Be sure workers do not carry asbestos dust home on their clothing or person. Prevent asbestos dust from being carried to rest rooms, to eating areas, to non-asbestos workplaces, etc.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store asbestos in closed containers (dust tight) in a clean, secure area. Protect containers from physical damage. Do not open containers that can release asbestos dust without providing proper enclosure or control measures. Use dust suppression control measures at all stages of asbestos handling, use and disposal. Follow good housekeeping practices to prevent accumulations of asbestos-containing dust. Avoid inhalation of asbestos. The effects on cancer incidence of chronic exposure are not yet fully known. Monitor areas where asbestos dust is present to be sure of worker exposure levels; keep records to define exposures and retain for at least 20 years. Provide preplacement and annual medical examinations for those exposed in the workplace to 8-hr TWA of 0.1 asbestos fibers or more/cc which are >5 um in length. Retain medical records for at least 20 years.

DATA SOURCE(S) CODE: 2-4.6.12.14.20.26.32

APPROVALS: MIS, CRD

Industrial Hygiene and Safety

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