



SAFETY DATA SHEET

Section 1: Identification

Product Identifier: Z-MAG Q

Other means of identification: Rigid shape of soluble high temperature fiber and Al₂O₃ binder. Soluble fiber board. Non-RCF Castertip.

Recommended use: Transport and casting of molten non-ferrous metals. Thermal and electrical insulation used primarily at high temperatures.

Manufacturer

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Section 2: Hazards Identification

Hazard Classification(s): Skin Irritation, Eye Effects, category 2 Respiratory Sensitizer

Signal Word: Warning



Precautionary Statement(s): May cause skin, eye and respiratory irritation.

CAUTION: Handling or machining of these products may produce respirable dust particles. Dust may irritate eyes, skin and respiratory tract.

Inhalation: Dust may cause irritation or soreness of throat and nose.

Eye Contact: Dust may cause temporary irritation or inflammation.

Skin Contact: May cause temporary dryness, irritation or rash.

Ingestion: Ingestion is unlikely. May cause gastrointestinal disturbances. Never induce vomiting without the advice of a physician.

Medical Conditions Aggravated by Exposure: Respiratory effects may be aggravated by smoking. Pre-existing respiratory problems may be aggravated by dust.

Section 3: Composition / Information on Ingredients

Chemical and common names, CAS numbers and concentration

Chemical Name	Common Name	CAS Number	% by Weight
Magnesium Silicate Fiber (AES) (Amorphous)	Soluble Fiber*	436083-99-7	75 - 83
Aluminum Oxide	Alumina	1344-28-1	17 - 25

*Also referred to as Alkaline Earth Silicate Wool (AES)

Section 4: First Aid Measures

Inhalation: If respiratory tract irritation develops, move the person to a dust free location. Rinse mouth to clear throat and expel liquid. Blow nose to evacuate dust. Consult a physician if irritation persists.

Eye Contact: Products can be physical irritants to eyes. Do not rub eyes. Keep hands or contaminated body parts away from eyes. Remove contact lenses. Flush with water. If irritation persists, consult a physician.

Skin Contact: Products are irritants. Wash with soap and water. For dryness, a skin cream may be helpful. Do not apply anything to a rash. Consult a physician if irritation persists.

Ingestion: Drink plenty of water. Do not induce vomiting without advice of a physician. Seek medical attention.

Notes to Physicians: Skin and respiratory effects are the result of temporary, mild mechanical irritation; fiber exposure does not result in allergic manifestations. The material is inert in the body. Some individuals may experience allergic sensitivity reactions. These are generally limited to mild occupational dermatitis. Chronic inhalation may result in pleural plaques not associated with cancers. Other effects principally derived from physical abrasion.

Aluminum Oxide dusts have caused no systemic or pathological problems. The material is inert in the body. Some individuals may experience allergic sensitivity reactions. These are generally limited to mild occupational dermatitis. Chronic inhalation may

result in pleural plaques not associated with cancers. Other effects principally derived from physical abrasion.

Section 5: Fire Fighting Measures

Materials are not combustible. Use extinguishing media suitable for type of surrounding fire.

Section 6: Accidental Release Measures

Spill Procedures: Clean up procedures should minimize formation of airborne dusts. Remove dust by vacuuming using HEPA filtration where possible or use wet sweeping or a dust suppressant where sweeping is necessary.

Release into Air: Prevent release of airborne particulates where possible. Not a regulated hazardous substance. See Section 8 for appropriate engineering controls.

Release into Water: Release into water is not appropriate. Not a regulated hazardous substance.

Section 7: Handling and Storage

Storage: These materials are stable and may be stored indefinitely. Physical abrasion may produce small amounts of respirable dusts. See precautions under Section 8.

Normal Use: Materials are stable under normal use and are not expected to produce significant hazardous by-products or emissions.

Machining and Cutting: These materials may produce respirable and nuisance dusts when machined or cut. See Section 8 for exposure controls and personal protection during machining or installation procedures.

High Temperature Conditions: Service significantly above the product design temperature may increase friability and the possibility of generating airborne fibers or particulates. While not considered problematic during use, airborne fibers may complicate removal activities. It is recommended that product use be carefully matched to design parameters.

After Service: As manufactured these products have low-biopersistence and do not represent any particular danger. They should, however, be handled with caution, and care taken not to breathe airborne fiber and dust generated by handling before or after use. It is important to note: The fibers used in these Soluble Fiber Insulation products may devitrify and form cristobalite (a form of crystalline silica) when used at temperatures above 1000°C for extended periods. Chronic exposure to respirable crystalline silica may lead to lung disease. IARC has concluded that "Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)." OSHA has adopted a permissible exposure limit (PEL) for respirable cristobalite at 0.05 mg/m³. Appropriate ventilation and respiratory protection should be provided in compliance with OSHA standards. Strict adherence to recommended safe work practices is advised. Product removal must consider the possibility of usage above design temperatures. See section 8 for appropriate respiratory protection during removal.

Section 8: Exposure Controls / Personal Protection

Exposure Limits

Aluminum Oxide	
OSHA PEL as 8 hr TWA	15/5 mg/m ³ Total dust/Respirable Fraction
ACGIH PEL as 8 hr TWA	10 mg/m ³ Inhalable particulate with no asbestos and <1% crystalline silica
Canadian PEL as TWA	5 mg/m ³
Magnesium Silicate Fiber (AES) (amorphous)	
OSHA PEL as 8 hr TWA	Not established
NIOSH PEL as 8 hr TWA	Not established
Particulates Not Otherwise Regulated, OSHA PEL as 8 hr TWA	
Total Dust	15 mg/m ³
Respirable Dust	5 mg/m ³
Particulates Not Otherwise Classified (PNOC), ACGIH	
Inhalable particulate	10 mg/m ³
Respirable particulate	3 mg/m ³

Appropriate Engineering Controls: Use dust suppression controls. Local exhaust ventilation, point of generation dust collection, and/or down-draft work stations to minimize airborne dust generation are recommended when machining product.

Recommendations for Personal Protective Measures

Respiratory Protection:	Use appropriate protection pursuant to OSHA 29CFR 1910.134, 29CFR 1926.103, and CFR1910.1000, Subpart Z, Air Contaminants. The following information is provided as a guide and reflects industry recommendations for control of dust.
PPE < 1.0 f/cc	No specific recommendation, use personal protective equipment based on local conditions.
PPE 1.0 f/cc to 5.0 f/cc	Half-face, air purifying respirator equipped with a high efficiency particulate air (HEPA) filter cartridge.
PPE 5.0 to 25 f/cc	Full-face, air purifying respirator equipped with a high-efficiency particulate air (HEPA) filter cartridge
PPE > 25 f/cc	Full-face, positive pressure, supplied air respirator.
Skin Protection	Wear gloves, head coverings, and full body clothing to prevent skin irritation. Disposable clothing may be used. Store work clothes and street clothes separately.
PPE Other	Work clothes should be washed separately and the washing machine rinsed following use. If possible, do not take work clothes home following machining or removal activities that produce significant amounts of dust.
Eye Protection	Wear safety glasses or chemical goggles to prevent eye contact. Do not wear contact lenses without goggles. Do not get dust or liquids into eyes. Have eye washing facilities available when using products.

These products are generally not hazardous during normal use. These guidelines are provided for special circumstances involved in machining, use and or after service removals. See Section 7 for after service and Section 13 for disposal recommendations.

Section 9: Physical and Chemical Properties

Physical and Chemical Properties

Appearance		Odor	Solubility in H ₂ O	Melting Point	Density (pcf)
Physical State	Color				
Rigid Insulation Shapes	White to Light Blue	Odorless	Soluble	1275 - 1500°C	14 - 28

Note: Viscosity, pH, Odor threshold, freezing point, initial boiling point and boiling range, flash point, evaporation rate, flammability, upper/lower flammability or explosive limits, vapor pressure, vapor density, partition coefficient: n-octanol/water, auto-ignition temperature and decomposition temperature are irrelevant and/or unavailable to/for these materials.

Section 10: Stability and Reactivity

Chemical Stability: Materials are stable with no possibility of hazardous reactions or polymerization.

Chemical Incompatibilities: Powerful oxidizers; fluorine, chlorine trifluoride, manganese trioxide, oxygen difluoride, etc.

Hazardous Decomposition Products: Fibers contained in these products may form cristobalite when used at temperatures above 1000C for sustained periods of time. See section 7 for more information.

Section 11: Toxicological Information

Exposure Routes and Effects

Inhalation: Dust may cause irritation or soreness of throat and nose.

Eye Contact: Dust may cause temporary irritation or inflammation.

Skin Contact: May cause temporary dryness, irritation or rash.

Ingestion: Ingestion is unlikely. May cause gastrointestinal disturbances. Never induce vomiting without the advice of a physician.

Medical Conditions Aggravated by Exposure: Respiratory effects may be aggravated by smoking. Pre-existing respiratory problems may be aggravated by dust.

Toxicology

Aluminum Oxide	
Acute Toxicity Estimate	LD ₅₀ : 4320 mg/kg
Carcinogenicity by IARC	Group A4: Not classifiable as a human carcinogen
Alkaline Earth Silicate (AES)	

Acute Toxicity Estimate	N/A
Carcinogenicity by IARC	Group A4: Not classifiable as a human carcinogen

Description of Symptoms: See Exposure Routes and Effects, Hazard Statement(s) and Precautionary Statement(s) sections above.

Additional Toxicology Information:

Aluminum Oxide dusts have caused no systemic or pathological problems. The material is inert in the body. Some individuals may experience allergic sensitivity reactions. These are generally limited to mild occupational dermatitis. Chronic inhalation may result in pleural plaques not associated with cancers. Other effects principally derived from physical abrasion.

Bio-persistence: a review of available scientific literature suggests an inverse relationship between dissolution rate and potential health effects; i.e. the higher the dissolution rate of a fiber the lower its potential to produce health effects. The dissolution rate of the fiber in these products has been determined through standardized *in vitro* testing. The dissolution rate of the fiber in these products is higher than that of other fiber types that have been tested in chronic animal studies and did not produce respiratory disease.

AES fibers contain a chemistry within the regulatory (European Commission Directive 97/69/EC) definition as a "man-made vitreous (silicate) fiber with random orientation with alkaline oxide and alkaline earth oxide (Na₂O + K₂O + CaO + MgO + BaO) content greater than 18% by weight". The fiber in these products has been tested pursuant to EU protocol ECB/TM/26, rev. 7, Nota Q, Directive 97/69/EC. The results for the short term biopersistence test by inhalation (IH test) were 6 days; well below the regulatory threshold of 10 days cited in Directive 97/69/EC. Based on testing results, the fiber in these products is not regarded as a potential carcinogen and is EXEMPT from European classification as such. By virtue of these test results, these products ARE EXEMPT from European regulatory guidelines that require hazard warning labels with specific risk phrases citing respiratory disease potential. In addition, the fiber in these products has been tested in an independent laboratory, by intratracheal (IT test) instillation, under a protocol that was consistent with the requirements of the German Hazardous Substances Ordinance (BGBI. I pp. 1782, 2049, Third Amendment, Appendix V, No. 7). The half-life clearance of the fiber in these products was 32.7 days; well below the applicable regulatory thresholds. Based on the IT test results, these products ARE EXEMPT from the requirements of the German Ordinance.

The definition of "irritant" contained in the hazard communication standard, 29 CFR 1900.1200, Appendix A, is "...a reversible inflammatory effect on living tissue by chemical action...". The fiber in these products is an inert material which doesn't interact chemically with exposed skin. However, there is a possibility that exposure to this product may cause temporary mechanical irritation to the eyes, skin or respiratory tract (nose, throat, lungs). This temporary irritation can be mitigated with proper handling practices designed to limit exposure and the use of protective clothing (glasses, gloves, clothing).

This product has not been specifically evaluated by any regulatory authority or other classification entity, such as the International Agency for Research on Cancer (IARC) or

the National Toxicology Program (NTP). Other types of man-made vitreous fibers (MMVF) have been evaluated and subsequently classified as potential carcinogens. Various classifications, such as "possible carcinogen", "probable carcinogen", and "reasonably anticipated to be a carcinogen" have been given to other MMVF's.

Section 12: Ecological Information

Eco toxicological Information: No information available.

Distribution: The substances these products are made of are naturally occurring and are widely distributed in igneous rock. Secondary deposits in sedimentary rock may be found.

Chemical Fate Information: The relative inertness of these materials indicates that they may be highly persistent in the environment. No information regarding any negative effects of this persistence has been noted.

Section 13: Disposal Consideration

Disposal: To prevent waste materials from becoming airborne during waste storage, transportation and disposal, a covered container or plastic bagging is recommended.

Hazardous Waste Classification: Materials as manufactured are not classified as a hazardous waste according to Federal regulations (40 CFR 261). Any processing, use, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the waste generator's responsibility to properly characterize a waste material, to determine if it is a "hazardous" waste. Disposal regulations vary. Check local, regional, state or provincial regulations to identify all applicable disposal requirements.

Empty Containers: Empty containers may contain product dust or residue. Do not re-use.

Disposal regulations vary. Consult with all applicable regulations prior to disposal. Refer to Section 8 for instructions regarding Exposure Controls/Personal Protection.

Section 14: Transportation Information

Materials are not regulated hazardous substances, no specific regulations apply.

Section 15: Regulatory Information

Regulated Constituents: Aluminum Oxide.

SARA Title III Constituent: listed none

SARA de Minimus Concentration: 1.0% N/A

N.J. Right to Know: listed none

Penn. Right to Know: listed none

Mass. Right to Know: listed none

SARA Note: The listed substance requires reporting under Section 313 of SARA Title III of the Emergency Planning and Community Right to Know Act, annually if above the de Minimus Concentration and threshold quantity.

New Jersey Right to Know Note: The listed substance is found on the New Jersey Hazardous substance list and is subject to reporting under SARA and the New Jersey Worker and Community Right to Know Act.

Pennsylvania Right to Know Note: The listed substance is subject to reporting under the Commonwealth of Pennsylvania's Worker and Community Right to Know Act. Form HSSF submissions due annually on April 1.

Mass. Right to Know Note: Items on the Massachusetts List of Hazardous Substances require specific hazard labeling in the workplace.

WHMIS Status: Aluminum oxide (CAS no. 1344-28-1) are subject to disclosure under the Hazardous Products Act.

Section 16: Other

Disclaimer:

The information contained herein is based on data considered to be accurate as of the preparation or revision date. It is provided in good faith and in compliance with state and federal regulations. No warranty or representation, express or implied is made as to the accuracy or completeness of this information. Other national, state and/or local regulations may apply.