



Material Safety Data Sheet

Material Name: MONOFRAX® E

ID: 352

***** Section 1 - Chemical Product and Company Identification *****

Chemical Name: Chrome Magnesia Spinel

Manufacturer Information

RHI Monofrax Ltd.
1870 New York Ave.
Falconer, NY 14733

Phone: (716) 483-7200

General Comments

CHEMTREC Assist: 1-800-424-9300 (Continental U.S.)
1-703-527-3887 (Outside Continental U.S. - Call Collect)

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

***** Section 2 - Composition / Information on Ingredients *****

CAS #	Component	Percent
70984-09-7	Spinel-group minerals, aluminum-chromium-iron-magnesium	70-80
54991-58-1	Aluminum chromium oxide	20-25
65997-17-3	Glass, oxide	4-5

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Nuisance particulates, Aluminum oxide (1344-28-1), Chromium (III) Compounds.

Component Information/Information on Non-Hazardous Components

This material contains crystalline silica. Due to a variable occurrence, the exact percentage of crystalline silica is unknown.

This product may contain trace levels (<0.1%) of hexavalent chromium.

***** Section 3 - Hazards Identification *****

Emergency Overview

WARNING! Product is a dark green to black block. Dusts from this product may be harmful if swallowed or inhaled. Dust from this product may be irritating to the eyes, respiratory system and skin. During normal conditions of use, this product is not expected to create any unusual health or emergency hazards. If the product is cut, sanded, ground or machined, dusts may be generated. **DO NOT CUT, SAND OR GRIND THIS PRODUCT** in a manner that will lead to the generation of dusts. Skin contact with dusts from this material may result in an allergic sensitization reaction. Inhalation of dusts from this product may result in allergic respiratory sensitization reactions. This product contains components that are cancer hazards.

Potential Health Effects: Eyes

Dust may cause irritation. Abrasive action may cause damage to the outer surface of the eye.

Potential Health Effects: Skin

May cause cuts and abrasions. Dust from cutting or grinding may cause irritation. Repeated or prolonged contact may cause a rash, itching, redness, and swelling (dermatitis). May also cause allergic reactions in some people.

Potential Health Effects: Ingestion

Ingestion of this product is unlikely because material is supplied in a block form. However, if the dusts from this product are swallowed it may be harmful. Product contains chromium compounds. Ingestion of sufficient amounts of some chromium compounds may result in dizziness, thirst, abdominal pain, vomiting, shock, and decreased urination.

Material Safety Data Sheet

Material Name: MONOFRAX® E

ID: 352

Potential Health Effects: Inhalation

Inhalation of dusts during normal usage is unlikely because product is supplied in a block form. However, if inhaled this product may be harmful. Dust from cutting or grinding may cause respiratory tract irritation, sore throat, coughing, or nasal congestion. Inhalation may produce allergic respiratory sensitization reactions.

Conditions Aggravated by Exposure

Pre-existing skin and respiratory disorders.

HMIS Ratings: Health: 2* Fire: 0 Physical Hazard: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes

Flush immediately with large amounts of water for at least 15-20 minutes while holding eyelids open. Do not rub eyes. Get immediate medical attention.

First Aid: Skin

Flush with large amounts of water while removing contaminated clothing. If irritation persists, get medical attention.

First Aid: Ingestion

Get immediate medical attention or advice -- Do not induce vomiting. Never give anything by mouth to a person who is unconscious or is having convulsions.

First Aid: Inhalation

Immediately remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. Seek medical attention.

*** Section 5 - Fire Fighting Measures ***

Flash Point: Not applicable

Upper Flammable Limit (UFL): Not applicable

Auto Ignition: Not applicable

Rate of Burning: Not applicable

General Fire Hazards

Not a fire hazard.

Hazardous Combustion Products

None identified.

Extinguishing Media

Use methods for the surrounding fire.

Fire Fighting Equipment/Instructions

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

NFPA Ratings: Health: 2 Fire: 0 Instability: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Avoid generating dusty conditions. The use of a dust suppressant agent or water is recommended to control the creation of airborne dusts.

Clean-Up Procedures

Collect spill using a vacuum cleaner with a HEPA filter. Avoid dry sweeping. When cleaning spill, wear appropriate personal protective equipment including safety goggles and chemical-resistant gloves. Releases into the environment may be reportable in certain states or localities.

Evacuation Procedures

None necessary.

Special Procedures

Follow all Local, State, Federal and Provincial regulations for disposal.

Material Safety Data Sheet

Material Name: MONOFRAX® E

ID: 352

*** Section 7 - Handling and Storage ***

Handling Procedures

Avoid contact with skin and eyes. Wash thoroughly after handling. Avoid breathing dusts from this material.

If this product has been in service at temperatures greater than 982°C (1800°F) it may contain cristobalite, a form of crystalline silica. IARC has classified crystalline silica, which includes cristobalite, as a group I carcinogen (known human carcinogen).

Removal and cleanup after service product may result in exposure to mixed dusts containing cristobalite and hexavalent chromium. NIOSH recommends the use of full face, positive pressure supplied air respirators for any detectable airborne concentrations of hexavalent chromium. If this product has been in service, particularly in the glass industry, it may be contaminated with toxic substances such as heavy metals. During removal, exposed product should be frequently misted with water to minimize airborne dusts. A surfactant may be added to the water to improve the wetting process. Use only enough water to wet the product. Do not allow water to accumulate on floors.

If this product has been in service at elevated temperature, particularly in the presence of alkaline vapors, it may contain hexavalent chromium. Hexavalent chromium is highly toxic, severely irritating to corrosive, a skin sensitizer and a known human carcinogen. IARC has classified hexavalent chromium as a Group I carcinogen.

Product packaging may contain product residue. Do not reuse.

Storage Procedures

Keep this material dry.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

No exposure limits have been developed by the Occupational Safety and Health Administration (OSHA) or the American Conference of Governmental Hygienists (ACGIH) for this product. Exposure limits exist for the following ingredients.

B: Component Exposure Limits

Spinel-group minerals, aluminum-chromium-iron-magnesium (70984-09-7)

- ACGIH: 10 mg/m³ TWA (inhalable particles); 3 mg/m³ TWA (respirable particles) (related to Particulates (insoluble or poorly soluble) not otherwise specified (PNOS))
OSHA: 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction) (related to Particulates not otherwise regulated)

Aluminum chromium oxide (54991-58-1)

- ACGIH: 10 mg/m³ TWA (particulate matter containing no asbestos and < 1% crystalline silica) (related to Aluminum oxide)
0.5 mg/m³ TWA (as Cr) (related to Chromium (III) Compounds)
OSHA: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction) (related to alpha-Alumina)
0.5 mg/m³ TWA (as Cr) (related to Chromium (III) Compounds)

Glass, oxide (65997-17-3)

- ACGIH: 10 mg/m³ TWA (inhalable particles); 3 mg/m³ TWA (respirable particles) (related to Particulates (insoluble or poorly soluble) not otherwise specified (PNOS))
OSHA: 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction) (related to Particulates not otherwise regulated)

C: Exposure Limits for Chemicals Generated in Use

Chromium (VI) compounds- water soluble (Not Available)

- ACGIH: 0.05 mg/m³ TWA (as Cr)

Material Safety Data Sheet

Material Name: MONOFRAX® E

ID: 352

Chromic acid (7738-94-5)

OSHA: 0.1 mg/m3 Ceiling

Silica, cristobalite (14464-46-1)

ACGIH: 0.05 mg/m3 TWA (respirable fraction)

OSHA: 0.05 mg/m3 TWA (respirable dust)

Engineering Controls

Ventilation should effectively remove and prevent buildup of any dust generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses or chemical goggles. The use of contact lenses is not recommended if dusts can be generated when handling this product.

Personal Protective Equipment: Skin

Use impervious gloves.

Personal Protective Equipment: Respiratory

If ventilation is not sufficient to effectively prevent buildup of dust, appropriate NIOSH/MSHA respiratory protection must be provided.

Personal Protective Equipment: General

Eye wash fountain is recommended.

*** Section 9 - Physical & Chemical Properties ***

Appearance: Dark green to black	Odor: Odorless
Physical State: Solid	pH: Not available
Vapor Pressure: Not applicable	Vapor Density: Not applicable
Boiling Point: Not available	Melting Point: 2150°C (3900°F)
Solubility (H2O): Slight	Specific Gravity: 4.25
Softening Point: Not available	

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable.

Conditions to Avoid

Avoid generation of dusts.

Incompatibility

None identified.

Hazardous Decomposition

None identified.

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

This product contains trivalent and possibly trace amounts of hexavalent chromium compounds. Chronic exposure to various chromium compounds has been reported to cause skin, eye and respiratory tract irritation, ulceration and perforation of the nasal septum, diminished sense of smell and taste, blood changes, pulmonary sensitization, pneumoconiosis, liver or kidney effects, various types of dermatitis, and skin sensitization.

In laboratory animals, chronic inhalation of trivalent chromium compounds has been reported to cause irritation of the bronchus and lungs, dystrophic changes of the liver and kidneys, pulmonary adenocarcinomas, and adverse effects on macrophages.

Material Safety Data Sheet

Material Name: MONOFRAX® E

ID: 352

B: Component Analysis - LD50/LC50

No LD50/LC50's are available for this product's components.

Carcinogenicity

A: General Product Information

For hexavalent chromium compounds, IARC has determined that there is sufficient evidence of carcinogenicity in experimental animals and humans (IARC Group 1). ACGIH has classified hexavalent chromium compounds as A1 (confirmed human carcinogen).

B: Component Carcinogenicity

Aluminum chromium oxide (54991-58-1)

ACGIH: A4 - Not Classifiable as a Human Carcinogen (related to Aluminum oxide)
A4 - Not Classifiable as a Human Carcinogen (related to Chromium (III) compounds)
IARC: Monograph 49, 1990 (related to Chromium (III) Compounds) (Group 3 (not classifiable))

C: Component Carcinogenicity for Chemicals Generated in Use

Chromium (VI) compounds (Not Available)

NTP Known Carcinogen (Select Carcinogen)
IARC Monograph 49, 1990 (Evaluated as a group) Group 1 (carcinogen to humans)

Silica, cristobalite (14464-46-1)

IARC Monograph 68, 1997 (inhaled in the form of quartz or cristobalite from occupational sources)
Group 1 (carcinogen to humans)

*** Section 12 - Ecological Information ***

Ecotoxicity

No information available.

Environmental Fate

No information available.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

This product, when discarded in its purchased form, is not considered a characteristic hazardous waste according to Federal regulations (40 CFR 261). You must test your waste using methods described in 40 CFR Part 261 to determine if it meets these or other applicable definitions of hazardous wastes.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

*** Section 14 - Transportation Information ***

International Transportation Regulations

This product is not regulated as a hazardous material by the United States (DOT) or Canadian (TDG) transportation regulations.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

No information available.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Aluminum chromium oxide (54991-58-1)

SARA 313: 1.0 % de minimis concentration (Chemical Category N090) (related to Chromium (III) Compounds)

Material Safety Data Sheet

Material Name: MONOFRAX® E

ID: 352

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Spinel-group minerals, aluminum-chromium-iron-magnesium (¹ related to Nuisance particulates)	70984-09-7	No	No	No	No	No	Yes 1
Aluminum chromium oxide (¹ related to Aluminum oxide) (² related to α -Alumina (aluminum oxide)) (³ related to Aluminum oxide (Al ₂ O ₃))	54991-58-1	No	Yes 1	Yes 2	Yes 1	Yes 3	Yes 1
Glass, oxide (¹ related to Nuisance particulates)	65997-17-3	No	No	Yes	No	No	Yes 1

C: Component Analysis

Component	CAS	CA	FL	MA	MN	NJ	PA
Chromium (VI) compounds- water soluble	Not Available	No	No	No	Yes	No	No
Chromic acid	7738-94-5	No	No	Yes	Yes	Yes	No
Chromium (VI) compounds	Not Available	No	No	No	Yes	No	Yes
Silica, cristobalite	14464-46-1	No	No	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Other Regulations

A: General Product Information

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all information required by the CPR.

Material Safety Data Sheet

Material Name: MONOFRAX® E

ID: 352

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Spinel-group minerals, aluminum-chromium-iron-magnesium	70984-09-7	Yes	Yes	No
Aluminum chromium oxide	54991-58-1	Yes	Yes	No
Glass, oxide	65997-17-3	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Aluminum chromium oxide	54991-58-1	1 % (English Item 44, French Item 195) (related to alpha-Alumina) 1 % (English Item 397, French Item 559) (related to Chromium (III) compounds)

D: Component Analysis: WHMIS IDL for Chemicals Generated in Use

Component	CAS #		Data
Chromic acid	7738-94-5	WHMIS	1 % (English Item 391, French Item 79)
Chromium (VI) compounds	Not Available	WHMIS	1 % (English Item 398, French Item 560)
Silica, cristobalite	14464-46-1	WHMIS	1 % (English Item 1405, French Item 1490)

WHMIS Classification: D2A,D2B

*** Section 16 - Other Information ***

Other Information

The information presented herein is based on data considered to be accurate as of the date of preparation of the Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice invention without a license.

In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

Key/Legend

NA = Not available or Not Applicable. ACGIH = American Conference of Governmental Industrial Hygienists. TLV = Threshold Limit Value. NIOSH = National Institute of Occupational Safety and Health. NTP = National Toxicology Program. OSHA = Occupational Safety and Health Administration. NFPA = National Fire Protection Association. HMIS = Hazardous Material Information System. CFR = Code of Federal Regulations. CERCLA = Comprehensive Environmental Response and Compensation Liability Act. SARA = Superfund Amendments and Reauthorization Act. IARC = International Agency for Research on Cancer. WHMIS = Workplace Hazardous Material Information System. RCRA = Resource Conservation and Recovery Act.

This is the end of MSDS # 352