

# MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian NOHSC, Japanese, and European Union Standards

## 1. PRODUCT IDENTIFICATION

<u>TRADE NAME (AS LABELED):</u>	<b>CHROMAFLAIR® TITANIUM PIGMENT (ALL COLORS)</b>
<u>CHEMICAL NAME/CLASS:</u>	Magnesium Fluoride-Coated Aluminum Pigment
<u>SYNONYMS:</u>	None Allocated
<u>U.N. NUMBER:</u>	None Allocated
<u>U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK:</u>	None Allocated
<u>HAZCHEM CODE (AUSTRALIA):</u>	None Allocated
<u>POISONS SCHEDULE NUMBER (AUSTRALIA):</u>	None Allocated
<u>PRODUCT USE:</u>	Pigmentation of a Variety of Products
<u>SUPPLIER/MANUFACTURER'S NAME:</u>	<b>JDSU</b>
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DATE OF PREPARATION: July 6, 2010  
DATE OF REVISION: July 6, 2010

NOTE: ALL United States Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, Canadian WHMIS [Controlled Products Regulations], European Union [Regulation (EC) 1907/2006 Annex II], Australian [NOHSC:2011 (2003)], and Japanese Industrial Standard (JIS Z 7250: 2000) required information is included in appropriate sections based on the U.S. ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the countries listed above.

## 2. HAZARD IDENTIFICATION

EU/AUSTRALIAN LABELING AND CLASSIFICATION: Irritant. Warning-this preparation contains substances not yet tested completely.

Risk Phrases: R: 15; R: 31; R: 36/37/38

See Section 16 for full text of Risk and Safety Phrases

HEALTH HAZARDS: The primary hazard associated with overexposure to this product is the potential for mild eye irritation or slight irritation of skin and other contaminated tissue.



FLAMMABILITY HAZARDS: This product may be combustible under some conditions. If exposed to extremely high temperatures, the products of thermal decomposition may include irritating fumes and toxic gases (e.g., titanium, magnesium, fluorine, and aluminum compounds).

REACTIVITY HAZARDS: Contact with water will cause the formation of hydrogen gas; under these conditions, closed containers may rupture (see Sections 7, Handling and Storage, and 10, Stability and Reactivity for further information).

ENVIRONMENTAL HAZARDS: This product may be harmful to the environment if released in large quantities.

## 3. COMPOSITION and INFORMATION ON INGREDIENTS

This product consists of microflakes that are thin layers of Magnesium Fluoride and Aluminum with Titanium as the outer layers. Propylene Glycol *n*-Propyl Ether is present as a wetting agent to reduce the generation of airborne dusts. Over 65% of the total weight of the product is Magnesium Fluoride.

Chemical Name	CAS #	EINECS	ENC Inventory #	EU/Australian Classifications	%/Content	EU/Australian Hazard Symbol	EU/Australian Risk Phrases
Titanium	7440-32-6	231-142-3	Not Listed (element)	Not Classified	1.0-10.0	Not Applicable	Not Applicable
Propylene Glycol <i>n</i> -Propyl Ether (present only in wetted flakes)	1569-01-3	216-372-4	7-97X	Not Classified	10.0	Not Applicable	Not Applicable
Aluminum	7429-90-5	231-072-3	Not Listed (element)	Highly Flammable	3.0-15.0		R 15 R 17
Magnesium Fluoride	7783-40-6	231-995-1	1-328	Xi: Irritant	Balance		R 36/37/38

See Section 16 for full text of Ingredient Risk and Safety Phrases

## 4. FIRST-AID MEASURES

Contaminated individuals must be taken for medical attention, especially if adverse effects continue after initial treatment. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to health professional with victim.

#### 4. FIRST-AID MEASURES (Continued)

**SKIN EXPOSURE:** If this product contaminates the skin and irritation develops, immediately begin decontamination with soap and water.

Remove exposed or contaminated clothing, taking care not to contaminate eyes. The contaminated individual must seek medical attention if adverse effects continue after flushing.

**EYE EXPOSURE:** If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids.

Have victim "roll" eyes. Minimum flushing is for 20 minutes. The contaminated individual must seek medical attention.

**INHALATION:** Although unlikely, if this product is inhaled, remove victim to fresh air. Seek medical attention if adverse symptoms continue after removal to fresh air.

**INGESTION:** If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION.

If professional advice is not available, do not induce vomiting. Victim should drink milk, egg whites, or large quantities of water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Pre-existing dermatitis, other skin conditions, and respiratory conditions may be aggravated by acute or chronic overexposures to this product.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure.

#### 5. FIRE-FIGHTING MEASURES

**FLASH POINT (Closed Cup):** 48°C (118°F) (for Propylene Glycol *n*-Propyl Ether)

**AUTOIGNITION TEMPERATURE:** Not established.

**FLAMMABLE LIMITS (in air by volume, %):** Not established.

**FIRE EXTINGUISHING MATERIALS:** Dry sand, talc, dry clay, dry ground limestone, sodium chloride, or approved Class D Extinguishers.

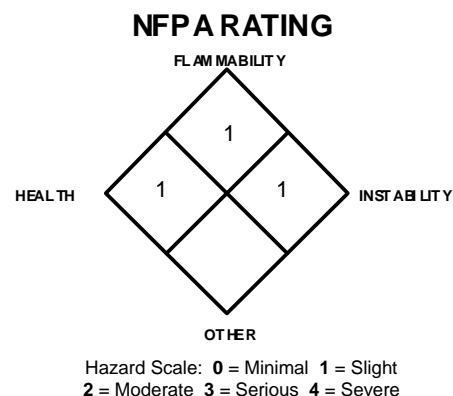
**FIRE EXTINGUISHING MATERIALS NOT TO BE USED:** Due to the presence of Aluminum, DO NOT use carbon dioxide, halogenated extinguishing agents, or water.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This product may be combustible under some conditions. When involved in a fire, the products of thermal decomposition may include irritating fumes and toxic gases (e.g., titanium, magnesium, fluorine, and aluminum compounds). Contact with water can cause the formation of flammable hydrogen gas; under these conditions, closed containers may rupture (see Sections 7, Handling and Storage, and 10, Stability and Reactivity for further information).

**Explosion Sensitivity to Mechanical Impact:** Not applicable.

**Explosion Sensitivity to Static Discharge:** Not applicable.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.



#### 6. ACCIDENTAL RELEASE MEASURES

**SPILL AND LEAK RESPONSE:** Proper protective equipment should be used. In the event of a spill, clear the area and protect people. The atmosphere must have levels of components lower than those listed in Section 8, (Exposure Controls and Personal Protective Equipment) if applicable, and have at least 19.5 percent oxygen before personnel can be allowed into the area without Self-Contained Breathing Apparatus (SCBA).

**Small Spills:** Wear rubber gloves, splash goggles, and appropriate body protection. Wipe up spilled material with polypads or other suitable materials.

**Large Spills:** Trained personnel following pre-planned procedures should handle non-incident releases. Minimum Personal Protective Equipment should be rubber gloves, rubber boots, face shield, and Tyvek suit. Minimum level of personal protective equipment for releases in which the level of oxygen is less than 19.5% or is unknown must be **Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus**. Sweep up or vacuum spilled material. Minimize the generation of airborne dusts. Prevent material from entering sewer or confined spaces, waterways, soil, or public waters. Monitor area and confirm levels are below exposure limits given in Section 8 (Exposure Controls-Personal Protection), if applicable, before non-response personnel are allowed into the spill area.

Place all spill residue in an appropriate container and dispose of properly. CAUTION! If spilled material is wet and stored in a closed container, the container can rupture violently. If containers are stored they must be vented. See Sections 7 and 10 for more information. Decontaminate the area thoroughly. Wash the area with soap and water, absorb with paper towels, and rinse with water. If necessary, discard all stained response equipment or rinse with soapy water before returning such equipment to service. Do not mix with wastes from other materials. Dispose of in accordance with applicable International, National, State, and local procedures (see Section 13, Disposal Considerations). For spills on water, contain, minimize dispersion, and collect. Dispose of recovered material and report spill per regulatory requirements.

#### 7. HANDLING and STORAGE

**SAFE WORK AND HYGIENE PRACTICES:** As with all chemicals, avoid getting this product ON YOU or IN YOU. Avoid breathing airborne dusts and vapors generated by this product. Wash thoroughly after using this product. Do not eat or drink while using this product. Remove contaminated clothing immediately. Periodically sweep up or wipe down area, to minimize the accumulation of particulates.

**STORAGE AND HANDLING PRACTICES:** All employees who handle this material should be trained to handle it safely. Use in a well ventilated location. Keep away from water, moist air, heat, sparks, and other sources of ignition. Open containers slowly on a stable surface. Store at room temperature, 20–25°C (68–77°F). Do not expose containers to extreme temperatures. Never expose product to temperatures above 49°C (120°F). Store in original vented container. Keep original container tightly closed when not in use. Empty containers may contain residual amounts of this product; therefore, empty containers should be handled with care. Store containers in a cool, well-ventilated, dry location, away from sources of intense heat. Store away from incompatible materials (see Section 10, Stability and Reactivity). Material should be stored in secondary containers, as appropriate. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Contact with water can generate flammable hydrogen gas and pressure buildup can cause the container to bulge or rupture. If this product is to be used in water-based applications (paint, ink, etc), it must first be evaluated for gassing and passivated as necessary.

**SPECIFIC USE(S):** This product is for use as a colorant. Follow all industry standards for use of this product.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**VENTILATION, ENGINEERING, AND OCCUPATIONAL EXPOSURE CONTROLS:** Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in later in this Section. Use local exhaust ventilation. If necessary, refer to Australian National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC: 2007 (1994)] for further information. As with all products that contain chemicals, ensure proper decontamination equipment (e.g., eyewash/safety shower stations) are available near areas where this product is used as necessary.

### EXPOSURE LIMITS:

<b>ACGIH TLVs</b>	<b>TWA:</b> <b>Aluminum:</b> 10 mg/m <sup>3</sup> <b>Fluorides:</b> 2.5 mg/m <sup>3</sup>	<b>STEL:</b> Not established
<b>OSHA-PELs</b>	<b>TWA:</b> <b>Aluminum:</b> 15 mg/m <sup>3</sup> (Total Dust) 5 mg/m <sup>3</sup> (Resp. fraction) <b>Fluorides:</b> 2.5 mg/m <sup>3</sup>	<b>STEL:</b> Not established.
<b>NIOSH-RELs/IDLH</b>	<b>TWA:</b> <b>Aluminum:</b> 10 mg/m <sup>3</sup> (Total Dust) 5 mg/m <sup>3</sup> (Resp. fraction) <b>Fluorides:</b> 2.5 mg/m <sup>3</sup> <b>IDLH:</b> <b>Titanium:</b> 250 mg/m <sup>3</sup>	<b>STEL:</b> Not established.
<b>DFG MAKs</b>	<b>TWA:</b> <b>Aluminum:</b> 1.5 mg/m <sup>3</sup> (Resp. fraction) <b>Fluorides:</b> 1 mg/m <sup>3</sup> <b>PEAK:</b> <b>Fluorides:</b> 4•MAK 15 min., average value, 1 hour interval	<b>STEL:</b> Not established.
<b>AIHA WEELs</b>	<b>TWA:</b> Not established.	<b>STEL:</b> Not established

**INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS:** In addition to the exposure limit values cited in this section, other exposure limits have been established by various countries for the components of this mixture. More current limits may be available; individual countries should be consulted to determine if newer limits are available.

#### ALUMINUM:

Australia: TWA = 10 mg/m<sup>3</sup>, JAN 1993  
Australia: TWA = 2 mg/m<sup>3</sup> (salts), JAN 1993  
Australia: TWA = 5 mg/m<sup>3</sup> (fumes), JAN 1993  
Australia: TWA = 5 mg/m<sup>3</sup> (resp. dust), JAN 1993  
Belgium: TWA = 10 mg/m<sup>3</sup>, JAN 1993  
Belgium: TWA = 2 mg/m<sup>3</sup> (salts), JAN 1993  
Belgium: TWA = 5 mg/m<sup>3</sup> (fumes), JAN 1993  
Denmark: TWA = 10 mg(Al)/m<sup>3</sup>, OCT 2002  
Denmark: TWA = 10 mg/m<sup>3</sup> (dust), OCT 2002  
Finland: TWA = 2 mg/m<sup>3</sup> (salts), JAN 1993  
France: VME = 10 mg/m<sup>3</sup>, JAN 1999  
France: VME = 5 mg/m<sup>3</sup> (fumes), JAN 1999  
France: VME = 5 mg/m<sup>3</sup> (resp. dust), JAN 1993  
Germany: MAK = 1.5 mg/m<sup>3</sup> (respirable), 2005  
Hungary: STEL = 5 mg/m<sup>3</sup>, JAN 1993  
Hungary: TWA = 2 mg/m<sup>3</sup>, STEL = 4 mg/m<sup>3</sup> (salts), JAN 1993  
Japan: OEL = 0.5 mg/m<sup>3</sup> (respirable), 2 mg/m<sup>3</sup> (total), MAY 2006  
Korea: TWA = 10 mg/m<sup>3</sup> (metal dust), 2006  
Korea: TWA = 5 mg/m<sup>3</sup> (pyro powders), 2006  
Korea: TWA = 5 mg/m<sup>3</sup> (welding fumes), 2006

#### ALUMINUM (continued):

Mexico: TWA = 10 mg/m<sup>3</sup>, STEL = 20 mg/m<sup>3</sup>, 2004  
Mexico: TWA = 5 mg(Al)/m<sup>3</sup> (pyro powders), 2004  
Mexico: TWA = 5 mg(Al)/m<sup>3</sup>, 2004  
The Netherlands: MAC-TGG = 10 mg/m<sup>3</sup>, 2003  
New Zealand: TWA = 10 ppm (metal dust), JAN2002  
New Zealand: TWA = 5 ppm (fumes), JAN2002  
New Zealand: TWA = 5 ppm (pyro powders), JAN2002  
Norway: TWA = 5 mg/m<sup>3</sup>, JAN 1999  
Russia: STEL = 2 mg/m<sup>3</sup>, JUN 2003  
Sweden: NGV = 4 mg/m<sup>3</sup> (resp. dust), JAN 1999  
Sweden: NGV = 10 mg/m<sup>3</sup> (total dust), JAN 1999  
Switzerland: MAK-W = 6 mg/m<sup>3</sup>, JAN 1999  
United Kingdom: TWA = 10 mg/m<sup>3</sup> (inhalable), 2005  
United Kingdom: TWA = 4 mg/m<sup>3</sup> (respirable), 2005  
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV  
**MAGNESIUM FLUORIDE:**  
Australia: TWA = 2.5 mg(F)/m<sup>3</sup>, JAN 1993  
Belgium: TWA = 2.5 mg(F)/m<sup>3</sup>, JAN 1993  
Denmark: TWA = 2.5 mg(F)/m<sup>3</sup>, OCT 2002  
EC: TWA = 2.5 mg(F)/m<sup>3</sup>, FEB 2006

#### MAGNESIUM FLUORIDE (continued):

Finland: TWA = 2.5 mg(F)/m<sup>3</sup>, JAN 1999  
France: VME = 2.5 mg(F)/m<sup>3</sup>, JAN 1999  
Germany: MAK = 1 mg(F)/m<sup>3</sup> (inhalable), 2005  
Hungary: TWA = 1 mg(F)/m<sup>3</sup>, STEL = 2 mg(F)/m<sup>3</sup>, JAN 1993  
Mexico: TWA = 2.5 mg(F)/m<sup>3</sup>, 2004  
New Zealand: TWA = 2.5 mg(F)/m<sup>3</sup>, JAN2002  
Norway: TWA = 6 mg(F)/m<sup>3</sup>, JAN 1999  
The Philippines: TWA = 2.5 mg(F)/m<sup>3</sup>, JAN 1993  
Poland: MAC(TWA) = 1 mg(HF)/m<sup>3</sup>, MAC(STEL) = 3 mg(HF)/m<sup>3</sup>, JAN 1999  
Russia: STEL = 0.5 mg/m<sup>3</sup>, STEL = 2.5 mg/m<sup>3</sup>, JUN 2003  
Sweden: NGV = 2 mg(F)/m<sup>3</sup>, JAN1999  
Switzerland: MAK-W = 1.8 ppm (1.5 mg(F)/m<sup>3</sup>), KZG-W = 3/6 ppm (3.0 mg(F)/m<sup>3</sup>), JAN 1999  
Thailand: TWA = 2.5 mg(F)/m<sup>3</sup>, JAN 1993  
Turkey: TWA = 2.5 mg(F)/m<sup>3</sup>, JAN 1993  
United Kingdom: TWA = 2.5 mg(F)/m<sup>3</sup>, 2005  
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV  
**PROPYLENE GLYCOL n-PROPYL ETHER:**  
Denmark: TWA = 100 ppm (tentative), OCT 2002

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132), equivalent standards of Canada (including CSA Standard Z94.4-02 and CSA Standard Z94.3-07), standards of EU member states (including EN 529:2005 for respiratory PPE, CEN/TR 15419:2006 for hand protection, and CR 13464:1999 for face/eye protection), or standards of Australia (including AS/NZS 1715:1994 for respiratory PPE, AS/NZS 4501.2:2006 for protective clothing, AS/NZS 2161.1:2000 for glove selection, and AS/NZS 1336:1997 for eye protection). Please reference applicable regulations and standards for relevant details.

**RESPIRATORY PROTECTION:** If airborne particulates or vapors from this product are created during use, use appropriate respiratory protection. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-02, the European Standard EN 529:2005, EU member state standards, Japanese standards, Australian Standard 1716-Respiratory Protective Devices, or Australian Standard 1715-Selection, Use, and Maintenance of Respiratory Protective Devices. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. Federal OSHA's Respiratory Protection Standard (1910.134-1998).

**EYE PROTECTION:** Splash goggles or safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian CSA Standard Z94.3-07, European Standard CR 13464:1999, Australian Standard 1337-Eye Protection for Industrial Applications, or Australian Standard 1336-Recommended Practices for Eye Protection in the Industrial Environment.

**HAND PROTECTION:** Wear latex or rubber gloves for routine industrial use. Use triple gloves for spill response. If necessary, refer to U.S. OSHA 29 CFR 1910.138 appropriate Standards of Canada, the Australian Standard 2161-Industrial Safety Gloves and Mittens and the European Standard CEN/TR 15419:2006.

**BODY PROTECTION:** Use body protection appropriate for task (e.g., lab coat, coveralls, Tyvek suit). If necessary, refer to the OSHA Technical Manual (Section VII: Personal Protective Equipment) or appropriate Standards of Canada, the European Standard CEN/TR 15419:2006, or Australian Standard 3765-Clothing for Protection Against Hazardous Chemicals. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136 and the Canadian CSA Standard Z195-02, *Protective Footwear*.

## 9. PHYSICAL and CHEMICAL PROPERTIES

The following data are for this product.

**APPEARANCE AND COLOR:** This product is an iridescent powder that comes in a variety of colors and has a mild odor of glycol ether.

**HOW TO DETECT THIS SUBSTANCE (warning properties):** The appearance of this product acts as a distinguishing characteristic.

The following data are for Magnesium Fluoride, the main component of this product.

**pH:** Not applicable.

**BOILING POINT:** 2260°C (4100°F)

**VAPOR PRESSURE, mm Hg @ 20°C:** Not applicable.

**SOLUBILITY:** Insoluble.

**VISCOSITY:** Not determined.

**EVAPORATION RATE (n-BuAc = 1):** Not applicable.

**COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT):** Not applicable.

The following data are for the Propylene Glycol *n*-Propyl Ether component of this product.

**FLASH POINT:** 48°C (118°F)

**EXPLOSIVE PROPERTIES:** Not explosive

**MELTING/FREEZING POINT:** 1263°C (2305°F)

**SPECIFIC GRAVITY (water = 1):** Dry: 2.98, Wetted: 2.41 (average)

**SOLUBILITY IN WATER:** Insoluble.

**RELATIVE VAPOR DENSITY (air = 1):** Not determined.

**ODOR THRESHOLD:** Not applicable.

**FLAMMABILITY:** Combustible.

**OXIDIZING PROPERTIES:** Not an oxidizer.

## 10. STABILITY and REACTIVITY

**DECOMPOSITION CONDITIONS/STABILITY:** Stable under normal conditions of handling. This pigment is inorganic in nature and composed of aluminum, nickel, and magnesium fluoride. The aluminum layer can undergo reaction with water to generate flammable hydrogen gas. Passivation is usually necessary to prevent gassing due to interaction of the aluminum layer of the pigment with water.

**DECOMPOSITION PRODUCTS: Combustion:** Titanium, magnesium, fluorine, and aluminum compounds. **Hydrolysis:** Hydrogen.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** This product would be incompatible with strong acids and oxidizers. Contact with water can slowly generate flammable hydrogen gas. Contact with strong acids, strong bases or alcohols can also release hydrogen.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Exposure or contact to extreme temperatures and incompatible chemicals.

## 11. TOXICOLOGICAL INFORMATION

**SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE:** The most significant routes of occupational overexposure are inhalation of dusts or particulates and contact with skin and eyes. The symptoms of overexposure to this product, via route of exposure, are as follows:

**INHALATION:** Inhalation of this product can irritate the nose, throat, and other tissues of the respiratory system and cause coughing, sneezing, sore throat, and nasal congestion. Inhalation of high concentrations of the vapors from the Propylene Glycol *n*-Propyl Ether component of this product may cause headache, nausea, lightheadedness, and drowsiness. Long-term inhalation overexposure to the Magnesium Fluoride component of this product may perforate the nasal septum; however, because a very small amount of Magnesium Fluoride is exposed on the surface of the particles, such an effect is unlikely. Chronic inhalation of aluminum dusts may cause pulmonary fibrosis (a disorder of the lungs).

**CONTACT WITH SKIN or EYES:** If this product or vapors from the wetting agent enter the eyes, it can cause redness and pain. Depending on the duration and concentration of exposure, skin contact may cause slight irritation.

**SKIN ABSORPTION:** The Propylene Glycol *n*-Propyl Ether component of this product can be absorbed through the skin. Animal studies indicate low toxicity by this route. Symptoms may include those described for "Contact with Skin and Eyes".

**INGESTION:** Ingestion is not anticipated to be a significant route of occupational overexposure for this product. If this product is swallowed (i.e., through poor hygiene practices), it may slightly irritate the mouth and throat.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE:** An Explanation in **Lay Terms**.

**Acute:** Contact with this product can irritate the nose, throat, eyes, skin and other contaminated tissues. Inhalation of high concentrations of the vapors from the Propylene Glycol *n*-Propyl Ether component of this product may cause headache, nausea, lightheadedness, and drowsiness.

**Chronic:** Long-term inhalation overexposure to Aluminum dusts may cause lung damage. Inhalation of dusts may be hazardous; however, the presence of wetting agents in this product should minimize exposure to airborne dusts.

**TARGET ORGANS: Acute:** Skin, eyes, respiratory system. **Chronic:** Lung

**TOXICITY DATA:** The following toxicological data are available for components of this product in 1% or greater concentration:

### ALUMINUM:

TCLo (inhalation, man) = 4 mg/m<sup>3</sup>/1 year-intermittent: Lungs, Thorax, or Respiration: cough, dyspnea; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TCLo (inhalation, rat) = 206 mg/m<sup>3</sup>/5 hours/30 days-intermittent: Lungs, Thorax, or Respiration: fibrosis (interstitial); Endocrine: hypoglycemia; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)

TDLo (oral, rat) = 1260 mg/kg: Multi-generations: Reproductive: Effects on Newborn: behavioral, physical, other postnatal measures or effects

TDLo (Unreported-Rat) 67.5 mg/kg: female 2-27 days after conception: Reproductive: Effects on Newborn: behavioral, delayed effects

### ALUMINUM (continued):

Rats injected with 100 mg aluminum powder directly into the trachea showed scarring in the lungs. Animals given about 1400 ppm aluminum in the diet had decreased phosphorus in the blood and bone. Aluminum particles implanted in rabbit eyes caused slight inflammation.

### MAGNESIUM FLUORIDE:

LD<sub>50</sub> (Oral-Rat) 2330 mg/kg

LDLo (Oral-Guinea Pig) 1 g/kg

### PROPYLENE GLYCOL *n*-PROPYL ETHER:

Skin Irritancy (rabbit) = 500 mg

Eye Irritancy (rabbit) = 100 mg; moderate

LD<sub>50</sub> (oral, rat) = 2504 mg/kg

LD<sub>50</sub> (skin, rabbit) = 3550 m

### TITANIUM:

TDLo (oral, rat) = 158 mg/kg; multi-generation: Reproductive: Effects on Fetus: fetotoxicity (except death, e.g., stunted fetus), fetal death

TDLo (intramuscular, rat) = 114 mg/kg/77 weeks/intermittent; Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Blood: lymphoma, including Hodgkin's disease; Tumorigenic: tumors at site of application

TD (intramuscular, rat) = 360 mg/kg/69 weeks/intermittent; Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Blood: lymphoma, including Hodgkin's disease; Tumorigenic: tumors at site of application

**CARCINOGENIC POTENTIAL OF COMPONENTS:** Components of this product are listed by agencies tracking the carcinogenic potential of chemical compounds, as follows:

**MAGNESIUM FLUORIDE (as an inorganic fluoride compound):** ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen); IARC-3 (Unclassifiable as to Carcinogenicity in Humans)

The remaining components of this product are not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, GERMAN MAK, IARC, or ACGIH and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

**IRRITANCY OF PRODUCT:** This product has been tested and may be mildly irritating to the eyes and slightly irritating to the skin.

## 11. TOXICOLOGICAL INFORMATION (Continued)

**SENSITIZATION TO THE PRODUCT:** This product has been tested and was determined not to be an allergen or a sensitizer.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of this product and its components on the human reproductive system.

**Mutagenicity:** The components of this product are not reported to produce mutagenic effects in humans.

**Embryotoxicity:** The components of this product are not reported to produce embryotoxic effects in humans.

**Teratogenicity:** The components of this product are not reported to cause teratogenic effects in humans.

**Reproductive Toxicity:** The components of this product are not reported to cause reproductive effects in humans.

A **mutagen** is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance that interferes in any way with the reproductive process.

**ACGIH BIOLOGICAL EXPOSURE INDICES:** The following ACGIH Biological Exposure Indices (BEIs) determined for the Magnesium Fluoride component of this product:

CHEMICAL DETERMINANT	SAMPLING TIME	BEI
FLUORIDES (Magnesium Fluoride) • Fluorides in urine	• Prior to shift • End of shift	• 3 mg/g creatinine • 10 mg/g creatinine

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

**MOBILITY:** This product has not been tested for mobility in soil.

**PERSISTENCE AND BIODEGRADABILITY:** This product has not been tested for persistence or biodegradability. It is expected that the metal components of this product will persist in the environment indefinitely. It is expected that the other components will slowly degrade in the environment and form a variety of organic and inorganic materials; however, no specific information is known. Data for components of this product are available as follows:

### ALUMINUM:

**Terrestrial Fate:** Air-dried, < 2 mm fractions of 3 soil samples from The Netherlands and 1 from New Hampshire, were taken from the surface and sub-surface horizons of two podzols (Haplorthods) and of a recent driftsand (Udipsamment). Duplicate samples of each emulsion soil horizon were leached with aqueous hydrogen chloride (pH 3.0). Charge balances of the leachates indicate that dissolved aluminum is present mainly as aquo-aluminum (+3). Only in leachates of podzol Bhs horizons is a significant fraction (20-30%) of dissolved Aluminum organically complexed. Dissolved aluminum concentrations are significantly correlated with the organic (Na4P2O7-extractable) aluminum content of the soil sample. Mobility of Aluminum in the Hubbard Brook soils is significantly lower than in the Dutch soils, because of higher soil-solution pH values. Albic and spodic soil horizons were sampled from old growth eastern white pine/mixed northern hardwoods. Adirondacks, and an ochric soil horizon was sampled from the Appalachian plateau of NY State. Three-horizon forest floor and 21 forest floor/mineral soil (field moist equivalent of 12.0 oven-dry albic, spodic, or ochric mineral soil) columns were leached in triplicate with either 10 µM nitric acid (pH 5), 5 µM sulfuric acid (pH 5), 100 µM nitric acid (pH 4), 50 µM sulfuric acid (pH 4), 1000 µM nitric acid (pH 3), 500 µM sulfuric acid (pH 3), or distilled, deionized water ((pH 5.7) control treatment). Nitric acid leached more Aluminum than did sulfuric acid from forest floor/spodic soil columns. Increasing the nitric acid concentration from pH 3-5 increased total Aluminum concentration in leachates from 0.70 to 0.85 mM, while increasing sulfuric acid had no effect. Addition of pH 3 sulfuric acid to forest floor/spodic columns raised leachate pH relative to pH 3 nitric acid and controls, and resulted in the lowest Aluminum concentration of all treatments in the first 3 of 4 sequential leachings.

**BIO-ACCUMULATION POTENTIAL:** This product has not been tested for bio-accumulation potential. No information is available for components.

**ECOTOXICITY:** This product has not been tested for aquatic or animal toxicity. All releases to terrestrial, atmospheric and aquatic environments should be avoided.

**OTHER ADVERSE EFFECTS:** This product does not contain any component with known ozone depletion potential.

**ENVIRONMENTAL EXPOSURE CONTROLS:** Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHODS:** It is the responsibility of the generator to determine at the time of disposal whether the product meets the criteria of a hazardous waste per regulations of the area in which the waste is generated and/or disposed of. Waste disposal must be in accordance with appropriate International, National, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Shipment of wastes must be done with appropriately permitted and registered transporters.

**DISPOSAL CONTAINERS:** Waste materials must be placed in and shipped in appropriate 5-gallon or 55-gallon poly or metal waste pails or drums. Permeable cardboard containers are not appropriate and should not be used. Ensure that any required marking or labeling of the containers be done to all applicable regulations.

**PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING:** Wear proper protective equipment when handling waste materials.

**U.S. EPA WASTE NUMBER:** Not applicable.

**EWC WASTE CODE:** Wastes from MFSU of Printing Inks: waste ink containing dangerous substances 08-03-12

## 14. TRANSPORTATION INFORMATION

**U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS:** This product is NOT classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

**TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** This product is not classified as Dangerous Goods, per regulations of Transport Canada.

**INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):** This product is not classified as Dangerous Goods, per rules of IATA.

**INTERNATIONAL MARITIME ORGANIZATION (IMO):** This product is not classified as Dangerous Goods, per rules of IMO.

**EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):** This product is not classified by the United Nations Economic Commission for Europe to be dangerous goods.

**AUSTRALIAN FEDERAL OFFICE OF ROAD SAFETY CODE FOR THE TRANSPORTATION OF DANGEROUS GOODS BY ROAD OR RAIL:** This product is not classified as Dangerous Goods, per regulations of the Federal Office of Road Safety.

## 15. REGULATORY INFORMATION

### ADDITIONAL UNITED STATES REGULATIONS:

**U.S. SARA REPORTING REQUIREMENTS:** The components of this product are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Aluminum (fume or dust)	No	No	Yes

**U.S. SARA THRESHOLD PLANNING QUANTITY:** There is no specific Threshold Planning Quantity for this product. The default Federal submission and inventory requirement filing-threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

**U.S. CERCLA REPORTABLE QUANTITY (RQ):** Not applicable.

**U.S. TSCA INVENTORY STATUS:** The components of this product are listed on the TSCA Inventory.

**OTHER U.S. FEDERAL REGULATIONS:** Aluminum is listed as hazardous air pollutant (HAPs) generally known or suspected to cause serious health problems. The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. Aluminum is included on this list. Aluminum is designated as toxic pollutants, pursuant to section 307(a)(1) of the Clean Water Act and is subject to effluent limitations. Aluminum is designated as hazardous substances under Section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of Aluminum.

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):** The components of this product and are not on the California Proposition 65 list.

**U.S. ANSI STANDARD LABELING (Precautionary Statements):** **WARNING!** MAY CAUSE SKIN, EYE, AND RESPIRATORY TRACT IRRITATION. CONTAINS WATER REACTIVE SUBSTANCE. REACTS WITH WATER TO RELEASE FLAMMABLE GAS. Keep away from water, moist air, heat, sparks, and other sources of ignition. Avoid contact with eyes, skin, and clothing. Avoid breathing mists or sprays. Store in original vented container. Keep container tightly closed. Use only with adequate ventilation. Wash thoroughly after use. Wear gloves, eye protection, respiratory protection, and appropriate body protection. **FIRST-AID:** In case of contact, immediately flush skin and eyes with plenty of water. Remove contaminated clothing and shoes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, foam, dry chemical, or CO<sub>2</sub>. **IN CASE OF SPILL:** Absorb spilled product with polypads or other suitable absorbing material. Place all spill residue in an appropriate container and seal. Dispose of in accordance with International, National, State, and local hazardous waste disposal regulations. Consult Material Safety Data Sheet for additional information.

### ADDITIONAL CANADIAN REGULATIONS:

**CANADIAN DSL/NDL STATUS:** The components of this product are on the DSL inventory.

**CANADIAN ENVIRONMENTAL PROTECTION AGENCY (CEPA) PRIORITIES SUBSTANCES LIST:** Magnesium Fluoride (as an Inorganic Fluoride) is on the Priority Substances List 1 (Substance Considered as Toxic under CEPA Section 11 [25]). Aluminum and Titanium are listed as Schedule 1 NPRI Substances.

**CANADIAN WHMIS CLASSIFICATION and SYMBOLS:** **Class B6:** Reactive Flammable Material; **Class D2B:** Other Toxic Effects (Irritating).



### ADDITIONAL EUROPEAN REGULATIONS:

**LABELING AND CLASSIFICATION:** This product meets the definition of Irritant as defined by the European Union Council Directive 67/548/EEC and subsequent Directives. Warning-this preparation contains substances not yet tested completely.

**Classification:** Irritant

[R: 15]: Contact with water liberates extremely flammable gases. [R: 31]: Contact with acids liberates toxic gas. [R: 36/37/38]: Irritating to eyes, respiratory system and skin.

**Safety Phrases:** [S: 2]: Keep out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) [S: 24]: Avoid contact with skin. [S: 26]: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S: 37/39]: Wear suitable gloves and eye/face protection.

**Annex II Hazard Symbol:** Xi



### INFORMATION FOR COMPONENTS:

#### Aluminum (powdered):

**Classification:** Flammable.

**Risk Phrases:** [R: 10]: Flammable. [R: 15]: Contact with water liberates extremely flammable gases.

**Safety Phrases:** [S: (2-)]: Keep out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) [S: 7/8]: Keep container tightly closed and dry. [S: 43]: In case of fire, use agent suitable for metal fires. Never use water.

#### Magnesium Fluoride: This is a self-classification.

**Classification:** Irritant.

**Risk Phrases:** [R: 36/37/38]: Irritating to eyes, respiratory system and skin.

**Safety Phrases:** [S: (-2)]: Keep out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) [S: 24]: Avoid contact with skin. [S: 26]: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S: 37/39]: Wear suitable gloves and eye/face protection. [S: 60]: This material and its container must be disposed of as hazardous waste.

#### All Other components:

**Classification:** An official classification for this substance has not been published in Commission Directives 93/72/EEC or 94/69EC.

## 15. REGULATORY INFORMATION (Continued)

### ADDITIONAL AUSTRALIAN REGULATIONS:

**AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS:** The components of this product are listed on the AICS. Hydrates of listed compounds and biological materials are exempt from listing. Any chemical not included in AICS is regarded as a new industrial chemical unless it is outside the scope of the Industrial Chemicals (Notification and Assessment) Act 1989 OR is otherwise exempt from notification. New industrial chemicals must be notified and assessed before being manufactured or imported into Australia.

**HAZARDOUS SUBSTANCES INFORMATION SYSTEM (HSIS):** Aluminum (only in dust form, so is not applicable to this product unless use creates dust) is listed in the HSIS.

**LABELING AND CLASSIFICATION:** This product meets the definition of Irritant as defined by the Australian National Occupational Health and Safety Commission [NOHSC (1008:2004)].

**Classification:** Irritant

**Risk Phrases:** [R: 15]: Contact with water liberates extremely flammable gases. [R: 36/37/38]: Irritating to eyes, respiratory system and skin.

**Safety Phrases:** [S: 2]: Keep out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) [S: 24]: Avoid contact with skin. [S: 26]: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S: 37/39]: Wear suitable gloves and eye/face protection.

**POISONS SCHEDULE NUMBER:** Schedule 6

**ADDITIONAL LABELING:** For advice, contact a poisons Information Centre (Phone Australia 131 126) or a doctor (at once). Urgent hospital treatment is likely to be needed. If swallowed, do NOT induce vomiting. If in eyes, hold eyelids apart and flush eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 20 minutes. If skin or hair contact occurs, remove contaminates clothing and flush skin and hair with running water. Avoid contact with eyes. Avoid contact with skin.

### ADDITIONAL JAPANESE REGULATIONS:

**JAPANESE MINISTRY OF ECONOMY, TRADE, AND INDUSTRY (METI) STATUS:** The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese METI.

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## 16. OTHER INFORMATION

**PREPARED BY:**

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Up-date of Canadian and EU/Australian classification.

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