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SAFETY DATA SHEET

Section 1- IDENTIFICATION

COMPOSITION	PRODUCT NAME
Cr	**Chromium**

SUPPLIER:	RECOMMENDED USE:	EMERGENCY TELEPHONE NUMBERS
Plasmaterials, Inc. **1270-B Quarry Lane** **Pleasanton, CA 94566** **Ph: 925-447-4030**	**Laboratory Chemicals** **Scientific Research**	**US: 001-800-424-9300** **Europe: 001-703-527-3887**

Section 2- HAZARD(S) IDENTIFICATION

Classification:
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Respiratory Sensitization: Category 1 (H334)	**Skin Sensitization:** Category 1 (H317)
Specific Target Organ Toxicity, Single Exposure: Category 2 (H371)	
Germ Cell Mutagenicity: Category 2 (H341)	
Acute Aquatic Toxicity: Category 1 (H400)	**Chronic Aquatic Toxicity:** Category 3 (H410)

LABEL ELEMENTS: Signal Word: Danger

HAZARD STATEMENTS

-H317: May cause an allergic skin reaction
-H320: Causes eye irritation
-H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
-H335: May cause respiratory irritation.
-H341: Suspected of causing genetic defects.
-H371: May cause damage to organs.
-H400: Very toxic to aquatic life
-H410: Very toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS

-P201: Obtain special instructions before use.
-P202: Do not handle until all safety precautions have been read and understood.
-P264: Wash face, hands and any exposed skin thoroughly after handling
-P270: Do not eat, drink or smoke when using this product
-P271: Use only outdoors or in a well-ventilated area.
-P273: Avoid release to the environment.
-P280: Wear protective gloves, protective clothing, eye protection and face protection
-P284: In case of inadequate ventilation, wear respiratory protection.
-P308 + P313: If exposed or concerned: Get medical advice/attention.
-P321: Specific treatment (See this label)

-P333 + P313: If skin irritation or rash occurs: Get medical advice/attention
-P337 + P313: If eye irritation persists: Get medical advice/attention
-P363: Wash contaminated clothing before reuse
-P391: Collect spillage.
-P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
-P405: Store locked up
-P501: Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC):

-None identified.

Section 3- COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS-No	Weight %
Chromium	**7440-47-3**	**<=100**

Section 4- FIRST AID MEASURES

GENERAL ADVICE: If exposed or concerned, get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Move out of dangerous area. Wash contaminated clothing before reuse.

INHALATION: Remove victim from exposure to fresh air. Give oxygen if breathing is difficult. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If experiencing respiratory symptoms, call a physician or a poison center.

SKIN CONTACT: Wash off with soap and plenty of water. If skin irritation or rash occurs: consult a physician. For minor skin contact, avoid spreading material on unaffected skin.

EYE CONTACT: Flush eyes with lukewarm water, lifting upper and lower lids, for at least 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing. Consult a physician.

INGESTION: Rinse mouth with water. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.

MOST IMPORTANT SYMPTOMS/EFFECTS: The most important known symptoms and effects are described in the labeling (see section 2). May cause allergic skin reaction. May cause allergic respiratory reaction. Irritation of eyes and mucous membranes.

INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED: Provide general supportive measures and treat symptomatically. Symptoms may be delayed.

Section 5- FIREFIGHTING MEASURES

Suitable Extinguishing Media:	**Unsuitable Extinguishing Media:**
Carbon Dioxide (CO2); Dry Chemical, Water Fog, alcohol-resistant foam	No Information Available

Specific Hazards Arising from the Chemical:

During fire, gases hazardous to health may be formed.

Protective Equipment & Precautions for Firefighters:

As in any fire, Firefighters must wear full face, self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective clothing to prevent contact with skin and eyes.

Firefighting Instructions/Specific Methods:

Use water spray to cool unopened containers. Water runoff can cause environmental damage. Use standard firefighting procedures and consider the hazards of other involved materials.

General Fire Hazards:

No unusual fire or explosion hazards noted.

Section 6- ACCIDENTAL RELEASE MEASURES

Personal Precautions: Ensure adequate ventilation. Use personal protective equipment. Avoid dust formation. Avoid breathing dust, vapors, mist or gas. Keep unnecessary personnel away. Evacuate personnel to safe areas. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained. For personal protection see Section 8.

Environmental Precautions: Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Avoid discharge into water coursed and onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. See Section 12 for additional ecological information.

Methods for Containment & Clean Up: Immiscible with water and will spread on the water surface. Stop the flow of material, if this is without risk. Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal. Do not let this chemical enter the environment, waterways, sewer, basements or confined areas. Following product recovery, flush area with water. For disposal see Section 13.

Section 7- HANDLING AND STORAGE

Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid contact with eyes and skin. Avoid prolonged exposure. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Do not empty into drains. Provide appropriate exhaust ventilation. Observe good industrial hygiene practices.

Storage:

Store locked up. Keep in a cool, dry and well-ventilated place out of direct sunlight. Store in original tightly closed container. Store away from incompatible materials (see Section 10).

Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

Component	CAS-No.	Value	Control Parameters	Basis
Chromium	7440-47-3	TWA	1 mg/m3	USA Occupational exposure limits (OSHA)-Table Z-1 Limits for air contaminants
		TWA	0.5 mg/m3	USA.ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract Irritation Skin Irritation Not classifiable as a human carcinogen varies		
		TWA	0.5 mg/m3	USA.NIOSH Pocket Guide to Chemical Hazards
		PEL	1 mg/m3	USA Occupational exposure limits (OSHA)-Table Z-1 Limits for air contaminants
		PEL	0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8 Article 107)
			See Sections 1532.2, 5206 & 8359	

Engineering Measures: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

Personal Protective Equipment:

Eye/Face Protection: Wear safety glasses with side shields or goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin and Body Protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Wear appropriate chemical resistant clothing. The type of protective equipment must be selected according

to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory Protection: Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dusk masks. Wear positive pressure self-contained breathing apparatus (SCBA). Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of Environmental Exposure: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Section 9- PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid
Appearance: Light grey
Odor: No data available
Odor Threshold: No data available
pH: No data available
Melting Point/Range: 1900°C / 3452°F
Boiling Point/Range: 2642°C / 4787.6°F
Flash Point: No data available
Evaporation Rate: No data available
Flammability (solid,gas): No information available
Flammability or Exposure Limits:
Upper: No data available
Lower: No data available
Vapor Pressure: No data available
Vapor Density: No data available
Relative Density: 7.140 g/cm3
Solubility: Insoluble
Partition coefficient; n-octanol/water: No data available
Auto Ignition Temperature: No data available
Decomposition Temperature: No data available
Viscosity: No data available
Explosive Properties: No data available
Oxidizing Properties: No data available
Molecular Weight: 52.00 g/mol

Section 10- STABILITY AND REACTIVITY

Reactive Hazard: No data available.

Stability: Stable under recommended storage conditions.

Conditions to Avoid: Contact with incompatible materials

Incompatible Materials: Strong acids, Strong oxidizing agents

Hazardous Decomposition Products:
Hazardous decomposition products formed under fire conditions-Chromium oxides
Other decomposition products-No data available

Hazardous Polymerization: No data available

Hazardous Reactions: No data available

Section 11- TOXICOLOGICAL INFORMATION

Information on Toxicological Effects:

Acute toxicity: May cause allergy or asthma symptoms or breathing difficulties if inhaled. May

cause respiratory irritation. May cause allergic skin reaction.
Inhalation: May cause irritation to the respiratory system. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Prolonged inhalation may be harmful.
Skin Contact: May cause an allergic skin reaction
Eye Contact: Causes eye irritation
Ingestion: Due to the lack of data, the classification is not possible
Skin Corrosion/Irritation: No information available
Serious eye damage/irritation: Causes eye irritation
Respiratory Sensitization: May cause allergy or asthma symptoms or breathing difficulties
Skin Sensitization: May cause an allergic skin reaction
Carcinogenicity:
-Carcinogenicity – Rabbit – Implant
Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Musculoskeletal: Tumors.
- Carcinogenicity – Rat – Implant
Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Blood: Lymphomas including Hodgkin's disease.
Tumorigenic: Tumors at site or application
-Carcinogenicity – Rat – Intravenous
Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Gastrointestinal: Tumors. Blood: Lymphomas including Hodgkin's disease.
-This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP or EPA classification.
-IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen.
-NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen.
-OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen.
Germ Cell Mutagenicity: Suspected of causing genetic defects
Reproductive Effects: No information available
STOT – single exposure: May cause damage to organs. Respiratory tract irritation
STOT – repeated exposure: No information available
Aspiration Hazard: No information available
Additional Information:
-RTECS: Not available
-Stomach – Irregularities – Based on Human Evidence
To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

Section 12- ECOLOGICAL INFORMATION

Toxicity: Very toxic to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected
Toxicity to Fish:
-Crustacea – EC50 – Water flea (Daphnia magna) – 0.01-0.7 mg/l – 48.0 h
-Fish – LC50 – Carp (Cyprinus carpio) – 14.m mg/l – 96.0 h
Persistence and Degradability: No information available
Bioaccumulation/Accumulation:
Bioaccumulation – Oncorhynchus mykiss (rainbow trout) – 30 d – 1.33 µg/l
Bioconcentration factor (BCF): 1.03-1.22
Mobility in Soil: No information available
Results of PBT and vPvB assessment: PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.
Other Adverse Effects: Very toxic to aquatic life. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13- DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dispose of contaminated

packaging as unused product.

Section 14- TRANSPORT INFORMATION

DOT: Not dangerous goods

IATA:

UN-No: 3077
Proper Shipping Name: Environmentally hazardous substance, Solid, N.O.S. (Chromium)
Hazard Class: 9
Packing Group: III

IMDG/IMO:

UN-No: 3077
Proper Shipping Name: Environmentally hazardous substance, Solid, N.O.S. (Chromium)
Hazard Class: 9
Packing Group: III
EMS-No: F-A, S-F
Marine Pollutant: Yes

Further Information:

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods >5L for liquids or >5Kg for solids.

Section 15- REGULATORY INFORMATION

US Federal Regulations:

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt.D): Not regulated
U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050): Not Listed
CERCLA Hazardous Substance List (40 CFR 302.4): Chromium (CAS No: 7440-47-3) – Listed
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302
SARA 313: The following components are subject to reporting levels established by SARA Title III, Section 313:

Component	CAS No.	Revision Date
Chromium	7440-47-3	2007-07-01

SARA 311/312 Hazards: Chronic Health Hazard
SARA Hazard Categories:

Immediate Hazard: Yes
Delayed Hazard: Yes
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: No

HMIS (USA):

Health Hazard: 0
Chronic Health Hazard: *
Flammability: 0
Physical Hazard: 0

National Fire Protection Association (USA):

Health Hazard: 0
Fire Hazard: 0
Reactivity Hazard: 0

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List: Chromium (CAS: 7440-47-3)
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130): Not regulated
Clean Water Act (CWA) Section 112 (r) (40 CFR 68.130): Priority pollutant – Toxic pollutant
Safe Drinking Water Act (SDWA): 0.1 mg/l
US Massachusetts RTK – Substance List:

Component	CAS No.	Revision Date
Chromium	7440-47-3	2007-07-01

US New Jersey Worker and Community Right to Know Act:

Component	CAS No.	Revision Date

Chromium	7440-47-3	2007-07-01

US New Jersey RTK – Substances: Listed substance:

Component	CAS No.	Revision Date
Chromium	7440-47-3	2007-07-01

US Pennsylvania RTK Hazardous Substances – Special Hazard – (All compounds of this substance are considered environmental hazards):

Component	CAS No.	Revision Date
Chromium	7440-47-3	2007-07-01

US Pennsylvania Worker and Community Right to Know Law:

Component	CAS No.	Revision Date
Chromium	7440-47-3	2007-07-01

US Rhode Island RTK:

Component	CAS No.	Revision Date
Chromium	7440-47-3	2007-07-01

US California Proposition 65: This product does not contain any chemicals known to the State of California to cause cancer, birth defects or any other reproductive harm.

US California Candidate Chemicals List Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3 subd. (a)): Chromium (CAS-No: 7440-47-3)

US California Controlled Substances, CA Department of Justice (California Health and Safety Code: Section 11100): Not listed

Section 16- OTHER INFORMATION

The above information is accurate to the best of our knowledge. However, since data, safety standards and government regulations are subject to change, the conditions of handling and use, or misuse are beyond our control, Plasmaterials, Inc. makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Users should satisfy themselves that they have all current data relevant to their particular use.

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