## MATERIAL SAFETY DATA SHEET
OSHA HAZARD COMMUNICATION RULE

**DATE OF LAST REVISION:** 04-25-96

### CHEMICAL IDENTITY

<table>
<thead>
<tr>
<th>LABEL IDENTITY</th>
<th>CHROMIUM (III) OXIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMICAL NAME/SYNONYMS</td>
<td>CHROMIUM (III) OXIDE</td>
</tr>
<tr>
<td>FORMULA</td>
<td>Cr2O3</td>
</tr>
<tr>
<td>CHEMICAL FAMILY</td>
<td>METAL OXIDE</td>
</tr>
<tr>
<td>CAS REGISTRY NUMBER</td>
<td>1308-38-9, LISTED IN THE TSCA INVENTORY</td>
</tr>
<tr>
<td>HAZARDOUS INGREDIENTS</td>
<td>CHROMIUM (III) OXIDE</td>
</tr>
</tbody>
</table>

| %:                              | 100                                   |
| TLV:                            | 500mg/m3                              |
| OSHA/PEL:                       | 1mg/M3                                |
| (for Cr)                        | (for Cr)                              |

### PHYSICAL AND CHEMICAL PROPERTIES

| COLOR, FORM AND ODOR            | Green powder/pieces. Odorless         |
| BOILING POINT                   | 4000°C                                |
| DENSITY (gm/cc)                 | 5.21                                  |
| VAPOR PRESSURE @ 20°            | NA                                    |
| % VOLATILE BY VOLUME (%)        | NA                                    |
| REACTION WITH WATER            | None                                  |
| EVAPORATION RATE (H2O=1)        | NA                                    |
| SOLUBILITY IN WATER            | Insoluble                             |
| MELTING POINT                   | 2266+/- degrees                       |

### FIRE AND EXPLOSION HAZARD DATA

| FLASH POINT                     | NA                                    |
| AUTOIGNITION TEMPERATURE (°C)   | NA                                    |
| FLAMMABILITY                    | Non-flammable                         |
| EXTINGUISHING MEDIA             | Use dry chemical                      |
| SPECIAL FIRE FIGHTING PROCEDURES| Self contained breathing apparatus should be worn by firefighters fighting fires where chromium oxide is stored |
| UNUSUAL FIRE & EXPLOSION HAZARDS| Toxic fumes may be evolved if involved in a fire. |
HEALTH HAZARD INFORMATION

TOXICITY DATA
HMIS RATING: NO DATA
HEALTH: 3* FLAMMABILITY: 0 REACTIVITY: 1 PERSONAL PROTECTION: J

ROUTES OF ENTRY
INHALATION: Yes
SKIN: Yes
INGESTION: No

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Pre-existing lung disorders
EFFECTS OF OVEREXPOSURE (acute and chronic):
INHALATION: chromium dusts can cause irritation of the nose, throat and mucous membranes as well as soreness of the nose and throat.
EYE/DERMAL: may cause eye irritation/repeated or prolonged contact with certain chromium compounds can cause eczematous dermatitis.
OTHER: Insoluble chromium compounds exhibit very low oral toxicity. No specific signs of chromium toxicity have been reported.

CARCINOGENICITY: Chromium NTP: Yes
IARC MONOGRAPHS: Yes OSHA REGULATE: No

EMERGENCY FIRST AID PROCEDURES:
INGESTION: induce vomiting, seek medical attention
INHALATION: remove to fresh air, seek medical attention
SKIN CONTACT: remove contaminated clothing and wash with soap and water
EYE CONTACT: Flush eyes for 15 minutes with plenty of water seek medical attention

REACTIVITY DATA
STABILITY Stable
CONDITIONS CONTRIBUTING TO UNSTABILITY None
INCOMPATIBILITY (MATERIALS TO AVOID) Strong acids, strong bases
HAZARDOUS DECOMPOSITION PRODUCTS NA
HAZARDOUS POLYMERIZATION Will Not Occur
CONDITIONS TO AVOID None
CHROMIUM OXIDE
MATERIAL SAFETY DATA SHEET

SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Vacuum up spill and place in a container for proper disposal. Take care not to raise dust.

WASTE DISPOSAL METHOD:
Consult federal, state and local regulations for proper disposal.

SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION
NIOSH approved dust-mist-fume cartridge respirator

LOCAL EXHAUST
Must meet TLV requirements

MECHANICAL (general)
NA

SPECIAL
NA

OTHER
NA

PROTECTIVE GLOVES
Neoprene

EYE PROTECTION
Safety glasses required

OTHER PROTECTIVE EQUIPMENT
Wear protective clothing to prevent contamination of skin and clothes

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE:
Keep containers closed. Wash hands and face thoroughly after handling material and before eating.

TRANSPORTATION REQUIREMENTS
DOT CLASS: Not Classified
UN NUMBER: NC
IMCO CLASS: NC

OTHER PRECAUTIONS IN LABELING:
NONE

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. ANGSTROM SCIENCES MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

NA= NOT APPLICABLE
ND= NO DATA FOUND