

# Chromium



## Safety Data Sheet

### Section 1: Identification

#### 1.1 Product Identifier

Product Name: Chromium  
 Product Form: Solid  
 Chemical Family: Metal  
 CAS Number: 7440-47-3  
 Molecular Formula: Cr  
 Molecular Weight: 51.996

#### 1.2 Other Means of Identification

Synonyms: Chrome; Chromium Element; Chromium Metal; Metallic Chromium; Cr; DLA05001; RTECS GB4200000

#### 1.3 Recommended Uses

Recommended Use: Variety of mechanical and industrial applications

#### 1.4 Manufacturer, Importer, or Responsible Party

Responsible Party: Defense Logistics Agency Strategic Materials  
 8725 John J. Kingman Road  
 Fort Belvoir, Virginia 22060-6223  
 (571) 767-5525

#### 1.5 Emergency Phone Number

Emergency Phone Number: (800) 424-9300 (CHEMTREC)  
 (703) 527-3887 (CHEMTREC INTERNATIONAL)

### Section 2: Hazard(s) Identification

#### 2.1 Classification of Chemical per OSHA CFR 1910.1200

Acute Toxicity (Oral): Category 2  
 Skin Irritation: Category 2  
 Eye Irritation: Category 2B  
 Skin Sensitization: Category 1A  
 Germ Cell Mutagenicity: Category 2  
 Reproductive Toxicity: Effects on or via Lactation  
 Target Organ Toxicity– Prolonged: Category 1 (Lungs, Kidney)

#### 2.2 Label Elements

Signal Word: DANGER



Symbol(s):

Format: GHS

Language: English (US)

Revised: April 24, 2015  
 Version 2

**Hazard Statements:**

Fatal if swallowed. Causes skin irritation. Causes eye irritation. May cause an allergic skin reaction. Suspected of causing genetic defects. May cause harm to breast-fed children. Causes damage to lungs and kidneys through prolonged or repeated exposure.

**Precautionary Statements:**

Prevention: Wear protective gloves, protective clothing, eye protection, and face protection. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe dust. Contaminated clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid contact during pregnancy and/or while nursing.

Response: If swallowed, immediately call a poison center and/or doctor. Rinse mouth. If on skin, wash with plenty of water. If skin irritation or rash occurs, get medical advice and/or attention. Take off contaminated clothing and wash it before reuse. If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention. If exposed, concerned, or feeling unwell, get medical advice and/or attention.

Storage: Store locked up.

Disposal: Dispose of contents in accordance with federal, state, and local regulations.

**2.3 Other Hazards**

Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

**2.4 Unknown Acute Toxicity**

Does not apply to this product.

## Section 3: Composition / Information on Ingredients

**3.1 Chemical Name**

Chemical Name: Chromium  
Composition: 99.00%-99.82% Cr

The health and physical hazards information provided in this SDS are for its major component. Chromium metal contains other elements in addition to Cr. For concentrations of other components, see the Certificates of Analysis for each lot.

**3.2 Common Names/Synonyms**

Synonyms: See **Section 1.2** for common names and synonyms.

**3.3 CAS Number/Unique Identifiers**

CAS Number: 7440-47-3  
EC Number (EINECS): 231-157-5

**3.4 Impurities/Stabilizing Additives**

No data available.

## Section 4: First-Aid Measures

**4.1 Description of First-Aid Measures**

**Inhalation:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

**Skin Contact:** Wash skin with soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Cover skin burns with dry, sterile dressings after decontamination. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

**Eye Contact:** Flush eyes with plenty of water for at least 15 minutes. Get immediate

Ingestion: medical attention.  
Rinse mouth and administer water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Get medical attention.

#### 4.2 Most Important Symptoms/Effects, Acute and Delayed

Inhalation (Acute):	Irritation.
Inhalation (Chronic):	Digestive disorders and lung damage.
Skin Contact (Acute):	Irritation.
Skin Contact (Chronic):	Kidney damage.
Eye Contact (Acute):	Irritation.
Eye Contact (Chronic):	Tearing.
Ingestion (Acute):	Vomiting, stomach pain, and dizziness.
Ingestion (Chronic):	No data available.

#### 4.3 Indication of immediate Medical Attention/Special Treatment

Antidote: Dimercaprol, intramuscular

## Section 5: Fire-Fighting Measures

#### 5.1 Suitable Extinguishing Media

Dolomite, dry powder for metal fires, dry sand, graphite, soda ash, and sodium chloride. Do not get water directly on material.

#### 5.2 Specific Hazards

Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

#### 5.3 Special Protective Equipment and Precautions

Respiratory protection from chromium metal and insoluble chromium salts should include a self-contained breathing apparatus with a full face piece operated in pressure-demand or other positive pressure mode. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep all unauthorized people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

## Section 6: Accidental Release Measures

#### 6.1 Personal Precautions, Protective Equipment, and Emergency Procedures

Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202) 426-2675 (USA). Personal protective equipment is discussed in **Section 8.3**. Keep material out of water sources and sewers. Build dikes to contain flow as necessary. Cover solids with a plastic sheet to prevent dissolving in rain or firefighting water. If spilled in water, neutralize with agricultural lime, crushed limestone, or sodium bicarbonate. Adjust pH to neutral.

#### 6.2 Methods and Materials for Containment and Clean Up

If chromium metal or insoluble chromium salts are spilled, the following steps should be taken:

1. Remove all ignition sources where metallic chromium has been spilled.
2. Ventilate area of spill.
3. Dampen the solid spill material with 5% ammonium hydroxide, and transfer the dampened material to a suitable container.
4. Deposit material and contaminated clothing in sealed containers for reclamation or for disposal in a secured sanitary landfill.
5. Wash all contaminated surfaces with 5% ammonium hydroxide followed by washing with a strong soap and water solution.
6. Do not re-enter the contaminated area until the Safety Officer (or other responsible person) has verified

that the area has been properly cleaned.

Liquid containing chromium metal or insoluble chromium salts should be absorbed in vermiculite, dry sand, earth, or a similar material.

## Section 7: Handling and Storage

### 7.1 Precautions for Safe Handling

Handle in accordance with all current regulations and standards. Utilize personal protective equipment to avoid contact with skin. Personal protective equipment is discussed in **Section 8.3**.

### 7.2 Conditions for Safe Storage

Store in accordance with all current regulations and standards. Store in a tightly closed container. Store in a cool, dry place. Store in a well-ventilated area. Keep separated from incompatible substances. Incompatible materials are identified in **Section 10.5**.

## Section 8: Exposure Controls / Personal Protection

### 8.1 Exposure Limits

OSHA PEL TWA (metal):	1 mg (Cr)/m <sup>3</sup>
ACGIH TWA (metal):	0.5 mg (Cr)/m <sup>3</sup>
NIOSH REL TWA 10 hour(s) (metal):	0.5 mg (Cr)/m <sup>3</sup>
EC OEL TWA (IOELV) (metal):	2 mg/m <sup>3</sup>
UK WEL TWA 8 hour(s) (metal):	0.5 mg/m <sup>3</sup>

### 8.2 Appropriate Engineering Controls

Ventilation: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

### 8.3 Individual Protection Measures

Eye Protection: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate area.

Clothing: Wear appropriate chemical resistant clothing.

Gloves: Wear appropriate chemical resistant gloves.

Respirator:

The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

2.5 mg/m<sup>3</sup>:

1. Any quarter-mask respirator.

5 mg/m<sup>3</sup>:

1. Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100 or P100.

2. Any supplied-air respirator.

12.5 mg/m<sup>3</sup>:

1. Any supplied-air respirator operated in a continuous-flow mode.

2. Any powered, air-purifying respirator with a high-efficiency particulate filter.

25 mg/m<sup>3</sup>:

1. Any air-purifying, full-facepiece respirator equipped with an N100, R100, or P100 filter.

2. Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

3. Any self-contained breathing apparatus with a full facepiece. Any supplied-air respirator with a full facepiece.

250 mg/m <sup>3</sup> :	1. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.
Unknown Concentrations/IDLH:	1. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. 2. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape:	1. Any air-purifying, full-facepiece respirator equipped with an N100, R100, or P100 filter. 2. Any appropriate escape-type, self-contained breathing apparatus.

## Section 9: Physical and Chemical Properties

<b>9.1 Appearance</b>	
Physical State:	Solid
Physical Description:	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid in pig, ingot or tub form.
<b>9.2 Odor</b>	
Odor:	Odorless
<b>9.3 Odor Threshold</b>	
Not available.	
<b>9.4 pH</b>	
Not applicable.	
<b>9.5 Melting / Freezing Points</b>	
Melting Point:	3,339°F-3,411°F (1,837°C-1877°C)
Freezing Point:	No data available.
<b>9.6 Boiling Point</b>	
Boiling Point:	4,842°F (2,672°C)
<b>9.7 Flash Point</b>	
No data available.	
<b>9.8 Evaporation Rate</b>	
Not applicable.	
<b>9.9 Flammability</b>	
Flammability:	0.230 oz/ft <sup>3</sup>
<b>9.10 Upper/Lower Explosive Limits</b>	
No data available.	
<b>9.11 Vapor Pressure</b>	
Vapor Pressure:	1 mmHg @ 1,616°C
<b>9.12 Vapor Density</b>	
Not applicable.	
<b>9.13 Relative Density</b>	
Water = 1:	7.20 @ 28°C

**9.14 Solubility(ies)**

Insoluble:

Water, Nitric Acid, and Aqua Regia

Soluble:

Dilute Sulfuric Acid and Hydrochloric Acid

**9.15 Partition Coefficient**

No data available.

**9.16 Auto-Ignition Temperature**

No data available.

**9.17 Decomposition Temperature**

No data available.

**9.18 Viscosity**

No data available.

**Section 10: Stability and Reactivity****10.1 Reactivity**

Stable at normal temperatures and pressures.

**10.2 Chemical Stability**

Stable at normal temperatures and pressures. Not oxidized by air, even in presence of much moisture.

**10.3 Possibility of Hazardous Reactions**

Alkali Carbonates:

Attacked.

Alkalies (Caustic):

Attacked.

Ammonium Nitrate (Fused):

Violent or explosive reaction.

Bromine Pentafluoride:

Violent reaction and possible ignition.

Hydrogen Peroxide:

Violent decomposition reaction.

Lithium (Molten):

Vigorous reaction at elevated temperatures.

Nitrogen Oxide:

Incandescent reaction.

Oxidizers (Strong):

Fire and explosion hazard.

Potassium Chlorate (Fused):

Vigorous incandescent reaction.

Sulphur Dioxide:

Incandescent reaction.

**10.4 Conditions to Avoid**

None reported.

**10.5 Incompatible Materials**

Incompatibilities:

Bases, oxidizing materials, halogens, peroxides, and metals.

Reacts with dilute hydrochloric acid and sulfuric acid. Safe storage of the material is discussed in **Section 7.2**.**10.6 Hazardous Decomposition Products**

Thermal Decomposition Products:

Oxides of chromium.

**Section 11: Toxicological Information****11.1 Likely Routes of Exposure**

Routes of entry include inhalation, skin contact, eye contact, and ingestion.

**11.2 Symptoms**See **Section 4.2** for symptoms related to the physical, chemical, and toxicological characteristics.

**11.3 Short and Long Term Effects**

Inhalation (Acute):	High concentrations of dusts or fumes may cause irritation.
Inhalation (Chronic):	Repeated or prolonged exposure to various chromium compounds has been reported to result in ulceration and perforation of the nasal septum, irritation of the throat and lower respiratory tract, less commonly in gastrointestinal disturbances, blood changes, pulmonary sensitization, pulmonary pneumoconiosis or fibrosis, and rarely liver effects. These effects have not been reported from exposure to the metal per se.
Skin Contact (Acute):	Contact with dusts or powder may cause irritation.
Skin Contact (Chronic):	Repeated or prolonged exposure to various chromium compounds has been reported to cause various types of dermatitis, including eczema, "chrome holes", sensitization, and, in contact with damaged skin, kidney damage. These effects have not been reported from exposure to the metal per se.
Eye Contact (Acute):	Contact with dusts or powders may cause irritation.
Eye Contact (Chronic):	Repeated or prolonged exposure to some chromium compounds may cause conjunctivitis and lacrimation. These effects have not been reported from exposure to the metal per se.
Ingestion (Acute):	Chromium metal is poorly absorbed by the intestinal tract. Absorption of sufficient amounts of some chromium compounds may result in dizziness, intense thirst, abdominal pain, vomiting, shock, oliguria or anuria, and uremia, which may be fatal.
Ingestion (Chronic):	No data available.

**11.4 Numerical Measures of Toxicity**

Lethal Dose (LD <sub>50</sub> ):	27,500 µg/kg unreported-rat
Tumorigenic Data:	2,160 µg/kg intravenous-rat TDLo/6 week(s) intermittent; 1,200 µg/kg implant-rat TDLo/6 week(s) intermittent; 75 mg/kg implant-rabbit TDLo
Mutagenic Data:	DNA damage - human lung 1 µmol/L

**11.5 Carcinogen Status**

IARC:	Human Inadequate Evidence, Animal Inadequate Evidence, Group 3 (metal)
ACGIH:	A4 -Not Classifiable as a Human Carcinogen (metal)

## Section 12: Ecological Information

**12.1 Ecotoxicity**

Fish Toxicity:	14,300 µg/L 96 hour(s) LC <sub>50</sub> (Mortality) Common, mirror, colored, carp ( <i>Cyprinus carpio</i> )
Invertebrate Toxicity:	2,000 µg/L 0-5 hour(s) LETH (Mortality) Copepod ( <i>Tisbe holothuriae</i> )
Algal Toxicity:	3,000-5,000 µg/L NR hour(s) (Population Growth) Blue-green algae ( <i>Synechocystis aquatilis</i> )
Phytotoxicity:	9,900 µg/L 32 week(s) EC <sub>50</sub> (Biomass) Water-milfoil ( <i>Myriophyllum spicatum</i> )

**12.2 Persistence and Degradability**

No data available.

**12.3 Bioaccumulative Potential**

Bioconcentration:	20-40 µg/L NR week(s) BCF (Residue) Common bay mussel, blue mussel ( <i>Mytilus edulis</i> ) 100 µg/L
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**12.4 Mobility in Soil**

No data available.

**12.5 Other Adverse Effects**

No data available.

## Section 13: Disposal Considerations

Hazardous Waste Number(s): D007. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the regulatory level (5.0 mg/L). Dispose of in accordance with all applicable regulations.

## Section 14: Transport Information

- 14.1 UN Number**  
UN Number: 3077
- 14.2 UN Proper Shipping Name**  
UN Proper Shipping Name: RQ Environmentally hazardous substances, solid, n.o.s. (chromium)
- 14.3 Transport Hazard Class(es)**  
U.S. Department of Transportation: Hazard Class or Division 9  
CA Transportation/Dangerous Goods: Hazard Class or Division 9  
Land Transport ADR: Hazard Class or Division 9; Classification Code M7  
Land Transport RID: Hazard Class or Division 9; Classification Code M7  
Air Transport IATA: Hazard Class or Division 9  
Air Transport ICAO: Hazard Class or Division 9  
Maritime Transport IMDG: Hazard Class or Division 9
- 14.4 Packing Group**  
U.S. Department of Transportation: III  
CA Transportation/Dangerous Goods: III  
Land Transport ADR: III  
Land Transport RID: III  
Air Transport IATA: III  
Air Transport ICAO: III  
Maritime Transport IMDG: III
- 14.5 Environmental Hazards**  
No data available.
- 14.6 Transport in Bulk**  
No data available.
- 14.7 Special Precautions**  
No data available.

## Section 15: Regulatory Information

US Regulations  
CERCLA 102A/103 (40 CFR 302.4): 5,000 LBS RQ {solid metal particles <100 µm diameter (0.004 inches)}

SARA Title III  
Section 302 (40 CFR 355.30): Not regulated.  
Section 304 (40 CFR 355.40): Not regulated.  
Sections 311/312 (40 CFR 370.21): Not regulated.  
Section 313 (40 CFR 372.65): Yes (Chromium)

OSHA Process Safety: Not regulated.

State Regulations California Proposition 65:	Not regulated.
National Inventory Status US Inventory (TSCA):	Listed on inventory.
TSCA 12(b) Export Notification:	Not listed.

## Section 16: Other Information

*The information in this Safety Data Sheet meets the requirements of the United States Department of Labor OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.). This document is intended only as a guide to the appropriate precautionary material handling by a person trained in, or supervised by a person trained in, chemical handling. Exposure to this chemical may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, all of the potential hazards of use or interaction with other chemicals or materials cannot be identified on this Safety Data Sheet. The user should recognize that this chemical can cause injury, especially if improperly handled, precautionary measures are not followed, and personal protective equipment not worn. Read and understand all precautionary information prior to use. The Defense Logistics Agency (DLA) shall not be held liable for any damage resulting from handling or from contact with the above chemical.*

### References:

ChemADVISOR®, Inc. *Material Safety Data Sheet, Chromium*. September 4, 2008. (as provided by the Defense Logistics Agency)

American Conference of Governmental Industrial Hygienists. *2013 TLVs® and BEIs®*, ACGIH® Publication #0113. 2013.

US Department of Transportation. *Emergency Response Guidebook*. 2012

Centers for Disease Control and Prevention. *NIOSH Pocket Guide to Chemical Hazards*, <http://www.cdc.gov/niosh/npg/>.

National Institute of Health, Toxicology Data Network. <http://toxnet.nlm.nih.gov/>

NOTE: No data available: no data for this topic found using references listed.

Date of Preparation of Updated SDS: April 24, 2015