

CHROMIC ACID (CHROMIUM TRIOXIDE, CrO3)

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SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

CHROMIC ACID (CHROMIUM TRIOXIDE, CrO₃)
Synonyms: Chromium(VI) oxide; Chromic anhydride; Chromium trioxide
CAS: 1333-82-0

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Electroplating/chrome plating, metal surface treatment and anodizing, chemical intermediate, oxidizing agent in industrial processes. For industrial user only, under appropriate authorization/permit as applicable.
Uses advised against: All uses not specified in this section or in section 7.3. Not for consumer use.

1.3 Supplier's details:

SURAJ CHEMICALS
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1.4 Emergency phone number:

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SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), based on the published harmonized classification for chromium trioxide (CrO₃). This is a well-documented, strongly oxidizing and corrosive substance with established carcinogen/mutagen/reproductive-toxicant classifications.

Ox. Sol. 1	Oxidizing solids, Category 1, H271
Acute Tox. 2 (oral)	Acute oral toxicity, Category 2, H300
Acute Tox. 2 (dermal)	Acute dermal toxicity, Category 2, H310
Acute Tox. 2 (inhalation)	Acute inhalation toxicity, Category 2, H330
Skin Corr. 1A	Skin corrosion, Category 1A, H314
Resp. Sens. 1	Respiratory sensitisation, Category 1, H334
Skin Sens. 1	Skin sensitisation, Category 1, H317
Muta. 1B	Germ cell mutagenicity, Category 1B, H340
Carc. 1A	Carcinogenicity, Category 1A, H350
Repr. 1B	Reproductive toxicity, Category 1B, H360FD
STOT RE 1	Specific target organ toxicity, repeated exposure, Category 1, H372
Aquatic Acute 1	Hazardous to the aquatic environment, acute hazard, Category 1, H400
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic hazard, Category 1, H410

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

H271 – May cause fire or explosion; strong oxidizer.
H300 – Fatal if swallowed.
H310 – Fatal in contact with skin.
H314 – Causes severe skin burns and eye damage.
H317 – May cause an allergic skin reaction.
H330 – Fatal if inhaled.
H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H340 – May cause genetic defects.
H350 – May cause cancer.
H360FD – May damage fertility; may damage the unborn child.
H372 – Causes damage to organs (respiratory system) through prolonged or repeated exposure.
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.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.
P220: Keep away from clothing and other combustible materials.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P284: Wear respiratory protection.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303+P361+P353: IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313: IF exposed or concerned: Get medical advice/attention.
P370+P378: In case of fire: Use water spray/fog – do NOT use dry chemical or CO₂ near the product mass.
P501: Dispose of contents/container in accordance with local/national regulations on hazardous waste.

2.3 Other hazards which do not result in classification:

Hexavalent chromium (Cr(VI)) compounds, including chromium trioxide, are well-established human carcinogens by the inhalation route (occupational lung cancer); handle only under a controlled industrial hygiene program.
Not assessed as PBT/vPvB under the standard framework (inorganic substance).

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Chromium trioxide (chromic acid, anhydrous Cr(VI) oxide)
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 1333-82-0	Chromium trioxide — Ox. Sol. 1: H271; Acute Tox. 2: H300, H310, H330; Skin Corr. 1A: H314; Resp. Sens. 1: H334; Skin Sens. 1: H317; Muta. 1B: H340; Carc. 1A: H350; Repr. 1B: H360FD; STOT RE 1: H372; Aquatic Acute 1: H400; Aquatic Chronic 1: H410 – Danger	≥99%

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:

Non-applicable (supplied as a technical-grade single substance; flake/granular/molten grades available on request – see current specification sheet).

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:

Request medical assistance immediately, showing the SDS of this product. This product is fatal if swallowed, inhaled or absorbed through the skin.

By inhalation:

Remove the person affected to fresh air immediately, keeping them warm and at rest. If breathing has stopped, give artificial respiration (avoid mouth-to-mouth if contamination risk exists; use a pocket mask/resuscitator).
Obtain emergency medical attention immediately.

By skin contact:

Remove contaminated clothing immediately. Flood affected skin with plenty of water for at least 20 minutes while removing contaminated clothing. Obtain emergency medical attention immediately – causes severe burns and is fatal in contact with skin.

By eye contact:

Rinse immediately and thoroughly with copious amounts of water for at least 20 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Obtain emergency medical attention immediately.

By ingestion/aspiration:

Do NOT induce vomiting. Rinse mouth with water if the person is conscious. Obtain emergency medical attention immediately – fatal if swallowed.

4.2 Most important symptoms/effects, acute and delayed:

Acute and delayed effects are indicated in sections 2 and 11. Long-term/repeated exposure is associated with respiratory tract damage and cancer risk (see Section 11).

4.3 Indication of immediate medical attention and special treatment needed, if necessary:

Treat symptomatically under medical supervision; specific chelation/decontamination protocols for hexavalent chromium exposure should be followed by qualified medical personnel. No specific antidote for general public use.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

Suitable: Water spray/fog in large quantities (from a safe distance).
Unsuitable: Dry chemical powder, CO₂ and foam extinguishers are not effective or recommended for a strong-oxidizer fire of this type.

5.2 Specific hazards arising from the chemical:

Non-combustible but an extremely strong oxidizer; can cause or intensify fire and may react explosively with combustible/organic/reducing materials. Decomposes on strong heating, releasing toxic chromium oxide fumes/particulates.

5.3 Special protective actions for fire-fighters:

Evacuate all non-essential personnel immediately. Fight fire from a safe, protected distance; wear SCBA and full chemical-protective suit. Cool containers with water spray if it can be done without risk. Contain and prevent fire-fighting run-off from entering drains/watercourses, as it is highly toxic to aquatic life.

Additional provisions:

Do not allow this product to contact combustible materials under any circumstances.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Evacuate the area immediately. Do not touch spilled material. Use PPE described in section 8 before any intervention. Keep away from combustibles.

For emergency responders:

Only trained personnel in full chemical-protective equipment, including respiratory protection, should approach the spill. Keep all unprotected persons away.

6.2 Environmental precautions:

Prevent at all costs any entry into drains, watercourses or soil – extremely toxic to aquatic life. Notify environmental/regulatory authorities immediately in the event of any release to the environment.

6.3 Methods and materials for containment and cleaning up:

Contain the spill; do not use combustible absorbents (e.g. sawdust). Carefully collect using inert, non-combustible absorbent material and place in a clean, dry, labelled, chemically compatible container for disposal by a licensed hazardous-waste handler. Flush the affected area thoroughly with water afterward, containing all run-off.

6.4 Reference to other sections:

See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

A. General precautions for safe use:

Handle only under a controlled industrial hygiene program with engineering controls and full PPE. Avoid generating and breathing dust/mist. Keep away from all combustible, organic and reducing materials.

B. Technical recommendations for the prevention of fires and explosions:

Store and handle strictly segregated from all combustibles, organics, reducing agents and acids other than as required by the authorized process. Use only chemically compatible, dedicated equipment.

C. Technical recommendations on general occupational hygiene:

Do not eat, drink or smoke in areas where this product is handled. Wash hands and exposed skin thoroughly after use and before breaks. Shower and change clothing at the end of the shift; launder contaminated clothing separately.

D. Technical recommendations to prevent environmental risks:

Prevent any release to drains, watercourses or soil. Treat process effluent containing hexavalent chromium per applicable discharge-consent/effluent-treatment requirements before release.

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

Minimum Temp.	5°C
Maximum Temp.	30°C
Maximum time	24 Months (unopened, original packaging)

B. General conditions for storage:

Store in a cool, dry, well-ventilated place, strictly segregated from combustibles, organics, reducing agents and incompatible chemicals, in dedicated secondary containment. Keep containers tightly closed. Restrict access to authorized, trained personnel only.

7.3 Specific end use(s):

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product; electroplating/surface-finishing users should follow their applicable process safety and effluent-treatment protocols.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948, as amended, and international reference values for hexavalent chromium compounds:

Identification	Occupational Exposure Limit Type	Value
Chromium (VI) compounds, as Cr CAS: 1333-82-0	Time Weighted average concentration (8 hrs)	0.0002 – 0.05 mg/m³ depending on process/compound class (refer to current local regulatory limit)
	Short-term exposure limit	Typical value – refer to current specification sheet / local regulation

8.2 Appropriate engineering controls:

Use fully enclosed systems and local exhaust ventilation (e.g. plating tank mist suppression/extraction) to keep airborne hexavalent chromium concentrations as low as reasonably achievable, well below occupational exposure limits. PPE is a supplement to, not a substitute for, engineering controls.

B. Respiratory protection:

Full-face, powered air-purifying respirator or supplied-air respirator with appropriate particulate/acid-gas filter; SCBA for emergency response or where concentrations are unknown.

C. Specific protection for the hands:

Chemical-resistant gloves (butyl rubber, neoprene or PVC rated for strong oxidizing acids). Replace immediately at any sign of damage or breakthrough.

D. Eye and face protection:

Chemical splash goggles and full face shield; do not rely on goggles alone where splash risk exists.

E. Bodily protection:

Full chemical-protective suit/apron, chemical-resistant boots and gloves. Launder or dispose of contaminated clothing per a documented decontamination procedure – never take contaminated clothing home.

F. Additional emergency measures:

Emergency shower and eyewash stations must be immediately available and tested regularly.

Environmental exposure controls:

All process effluent containing hexavalent chromium must be treated (e.g. reduction to trivalent chromium and precipitation) before discharge, per applicable consent conditions.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	
Physical state at 20°C	Solid (flakes, granules or powder)
Appearance	Dark red to purplish-red crystalline solid
Color	Dark red / purplish-red
Odor	Odorless
Odour threshold	Not relevant *
Volatility	
Boiling point at atmospheric pressure	~250°C (decomposes)
Vapour pressure at 20°C / 50°C	Not relevant *
Evaporation rate at 20°C	Not relevant *
Product Description	
Density / Relative density at 20°C	~2.7 g/cm³ (typical)
Dynamic / Kinematic viscosity	Non-applicable (solid)
Concentration	≥99% typical (technical grade)
pH (1% aqueous solution)	<1 (strongly acidic)
Vapour density at 20°C	Not relevant *
Partition coefficient n-octanol/water 20°C	Not relevant (inorganic) *
Solubility in water at 20°C	Highly soluble, >600 g/L
Decomposition temperature	~250°C
Melting point/freezing point	196°C
Flammability	
Flash Point	Non-applicable (solid oxidizer)
Flammability (solid, gas)	Non-flammable; extremely strong oxidizer
Autoignition temperature	Not relevant *
Lower / Upper flammability limit	Not relevant *
Particle Characteristics	
Median equivalent diameter	Typical value – refer to current specification sheet

** Not relevant due to the nature of the product, not providing information on the properties of its hazards.*

9.2 Other information:

Explosive properties	Not an explosive; may react violently with combustibles/reducers
Oxidising properties	H271 – May cause fire or explosion; strong oxidizer
Corrosive to metals	Corrosive to most common metals in solution
Heat of combustion	Not relevant *

Surface tension at 20°C	Not relevant *
Refraction index	Not relevant *

SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:**
Extremely strong oxidizer. Reacts violently, potentially explosively, with combustible materials, organic solvents, reducing agents, alcohols, and many metals. Reacts with water to form chromic acid solution (corrosive).
- 10.2 Chemical stability:**
Stable under recommended storage conditions when kept dry and segregated from incompatible materials. Hygroscopic.
- 10.3 Possibility of hazardous reactions:**
Contact with combustible, organic or reducing materials can cause fire or violent/explosive reaction. Avoid all such contact.
- 10.4 Conditions to avoid:**

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Avoid mechanical shock near combustibles	Not applicable	Avoid high heat	No special precautions	Avoid contact with moisture (hygroscopic)

- 10.5 Incompatible materials:**
- | Combustible / Organic Materials | Reducing Agents | Alcohols / Solvents | Metals (powdered) | Water |
|-------------------------------------|----------------------------------|---------------------------|-------------------|-----------------------------------|
| Avoid contact – fire/explosion risk | Avoid contact – violent reaction | Avoid contact – fire risk | Avoid contact | Reacts to form corrosive solution |

- 10.6 Hazardous decomposition products:**
Toxic chromium oxide fumes/particulates and oxygen on strong heating/decomposition.

SECTION 11: TOXICOLOGICAL INFORMATION

- 11.1 Information on toxicological effects:**
This substance presents severe acute and chronic hazards. Hexavalent chromium compounds, including chromium trioxide, are well-documented human carcinogens, mutagens and reproductive toxicants, and cause severe corrosive injury:
- A. Ingestion (acute effect):**
Fatal if swallowed. Causes severe corrosive burns to the mouth, throat, oesophagus and gastrointestinal tract; systemic toxicity including kidney and liver damage.
- B. Inhalation (acute effect):**
Fatal if inhaled. Causes severe irritation/corrosion of the respiratory tract; can cause pulmonary oedema. Nasal septum perforation is a recognised effect of chronic inhalation exposure.
- C. Contact with skin and eyes (acute effect):**
Fatal in contact with skin. Causes severe skin burns and serious eye damage, including risk of blindness.
- D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):**
May cause cancer (lung cancer by inhalation – Category 1A). May cause genetic defects (Category 1B). May damage fertility and the unborn child (Category 1B). IARC Group 1: Carcinogenic to humans (hexavalent chromium compounds).
- E. Sensitizing effects:**
Known skin and respiratory sensitiser; may provoke allergic contact dermatitis ("chrome ulcers") and occupational asthma.
- F. Specific target organ toxicity (STOT) – single exposure:**
Severe corrosive/irritant effects on the respiratory tract covered under acute toxicity classification.
- G. Specific target organ toxicity (STOT) – repeated exposure:**
Causes damage to the respiratory system through prolonged or repeated exposure (H372) – Category 1.
- H. Aspiration hazard:**
Classification criteria are not met based on available data.

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
Chromium trioxide CAS: 1333-82-0	LD50 oral: 80 mg/kg	Rat
	LD50 dermal: ≤50 mg/kg (as Cr(VI))	Rabbit
	LC50 inhalation: 0.14 mg/L (4h, as fine particulate)	Rat

SECTION 12: ECOLOGICAL INFORMATION

Very toxic to aquatic life with long lasting effects.

- 12.1 Toxicity:**
- | Identification | Acute Toxicity | Species | Genus |
|---|-----------------------|---------------------|------------|
| Chromium trioxide (as Cr(VI))
CAS: 1333-82-0 | LC50: 0.8 mg/L (96h) | Oncorhynchus mykiss | Fish |
| | EC50: 0.05 mg/L (48h) | Daphnia magna | Crustacean |

- 12.2 Persistence and degradability:**
Inorganic substance; not subject to biodegradation. Hexavalent chromium can be reduced to the less mobile/toxic trivalent form under certain environmental (reducing) conditions.
- 12.3 Bioaccumulative potential:**
Chromium does not significantly bioaccumulate in the food chain, though it can accumulate in sediments.

- 12.4 Mobility in soil:**
- | Koc | Henry | Dry Soil | Moist Soil |
|----------------------------|----------------|-----------------------------|-----------------------------|
| Non-applicable (inorganic) | Non-applicable | High (highly water soluble) | High (highly water soluble) |

- 12.5 Results of PBT and vPvB assessment:**
The standard organic PBT/vPvB framework does not apply to this inorganic substance; however, it is a recognised persistent environmental contaminant of concern and is strictly regulated for effluent discharge.
- 12.6 Other adverse effects:**
Not described

SECTION 13: DISPOSAL CONSIDERATIONS

- 13.1 Disposal methods:**
Must be disposed of only via a licensed hazardous-waste handler authorized to treat hexavalent chromium waste (typically chemical reduction of Cr(VI) to Cr(III) followed by precipitation/stabilization). Must not be discharged to drains, watercourses or general waste under any circumstances. For packaging: dispose of as hazardous waste; do not reuse or rinse to drain.
Refer to national and local hazardous-waste regulations, including those specific to hexavalent chromium.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):

14.1 UN number	UN1463
14.2 UN proper shipping name	CHROMIUM TRIOXIDE, ANHYDROUS
14.3 Transport hazard class(es)	5.1 (Labels: 5.1, 6.1, 8)
14.4 Packing group	I
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22):

14.1 UN number	UN1463
14.2 UN proper shipping name	CHROMIUM TRIOXIDE, ANHYDROUS
14.3 Transport hazard class(es)	5.1 (Subsidiary: 6.1, 8)
14.4 Packing group	I
14.5 Marine pollutant	Yes
14.6 Special precautions for user	EmS Codes: F-A, S-Q
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024):

14.1 UN number	UN1463
14.2 UN proper shipping name	CHROMIUM TRIOXIDE, ANHYDROUS
14.3 Transport hazard class(es)	5.1 (Subsidiary: 6.1, 8)
14.4 Packing group	I
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Forbidden on passenger aircraft in most configurations – cargo aircraft only; confirm current IATA restrictions
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product. Given its carcinogen/mutagen/reproductive-toxicant classification, use should be restricted to essential industrial applications under a documented occupational health surveillance program.

Other legislation:

- Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
- The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987), including provisions on carcinogenic substances
- Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
- Water (Prevention and Control of Pollution) Act, 1974 – effluent discharge standards for hexavalent chromium
- Public Liability Insurance Act, 1991

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

- H271: May cause fire or explosion; strong oxidizer.
- H300: Fatal if swallowed.
- H310: Fatal in contact with skin.
- H314: Causes severe skin burns and eye damage.
- H317: May cause an allergic skin reaction.
- H330: Fatal if inhaled.
- H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H340: May cause genetic defects.
- H350: May cause cancer.
- H360FD: May damage fertility; may damage the unborn child.
- H372: Causes damage to organs through prolonged or repeated exposure.
- H400: Very toxic to aquatic life.
- H410: Very toxic to aquatic life with long lasting effects.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Personnel handling this product must receive specific, documented training on carcinogen handling, PPE use, spill response and emergency procedures, in addition to a thorough understanding of this safety data sheet and the product label; medical surveillance per applicable occupational health regulation is recommended.

Principal bibliographical sources:

United Nations GHS (Rev. 8); European Chemicals Agency (ECHA) classification and labelling inventory (harmonized Annex VI classification for chromium trioxide); International Agency for Research on Cancer (IARC) monographs; publicly available chemical supplier safety data sheets for this CAS number.

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | IARC: International Agency for Research on Cancer | Cr(VI): Hexavalent chromium

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET