SAFETY DATA SHEET

RED OXIDE (IRON OXIDE RED)

CAS No.: 1309-37-1

This Safety Data Sheet is issued by Suraj Chemicals as the distributor/supplier of record, based on manufacturer and published GHS / regulatory reference data for this substance. Users should also consult the specific manufacturer's SDS where available.

1. IDENTIFICATION

GHS Product identifier

RED OXIDE (IRON OXIDE RED)
Ferric oxide; Iron(III) oxide; Synthetic/natural iron oxide pigment; Fe_2O_3
CAS: 1309-37-1

Other means of identification

Not relevant

Recommended use of the chemical and restrictions on use

Relevant uses: Pigment for paints, coatings, construction materials (cement/concrete colorant), rubber, plastics, ceramics and industrial fillers. For industrial user only.

Uses advised against: All uses not specified in this section or in section 7.3. Not for use in cosmetics or food unless separately certified to the applicable grade.

Supplier's details

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2. HAZARDS IDENTIFICATION

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). Iron oxide red does not meet the classification criteria for any GHS physical, health or environmental hazard class based on available data.

Not classified	Does not meet GHS classification criteria for physical, health or environmental hazards

GHS label elements, including precautionary statements

GHS: No pictogram, signal word or hazard statement required.

Hazard statements

None assigned. Not a hazardous substance under GHS criteria.

Precautionary statements

P264: Wash hands thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area (when generating dust).
P280: Wear protective gloves/eye protection/dust mask when handling powder in bulk.
P501: Dispose of contents/container in accordance with local/regional/national regulations.

Other hazards which do not result in classification

Fine powder may present a nuisance-dust inhalation hazard and, in bulk handling, a slip hazard from spillage. Not expected to be a combustible dust hazard (inorganic oxide).

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Chemical description: Iron(III) Oxide (Fe_2O_3), synthetic or natural pigment grade

In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 1309-37-1	Iron(III) Oxide (Red Oxide) – Not classified	≥ 96%

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

Mixtures

Non-applicable

4. FIRST AID MEASURES

Description of necessary first-aid measures

No specific first aid measures are normally required. Showing this SDS to medical personnel is recommended if discomfort occurs.

By inhalation

Remove the person affected to fresh air. Seek medical attention if coughing or respiratory discomfort persists.

By skin contact

Wash skin with plenty of water and soap. Seek medical advice if irritation develops.

By eye contact

Rinse eyes thoroughly with water for several minutes, holding eyelids apart, to remove particles. Seek medical attention if irritation persists.

By ingestion/aspiration

Rinse mouth with water. Not expected to be harmful in small amounts; seek medical advice if large quantities are ingested or discomfort occurs.

Most important symptoms/effects, acute and delayed

Mechanical irritation of eyes and respiratory tract from dust is possible. No significant delayed effects expected from this insoluble inorganic pigment.

Indication of immediate medical attention and special treatment needed, if necessary	Not relevant

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	**Suitable:** Product is non-combustible; use extinguishing media appropriate to the surrounding fire (water spray/fog, CO^2, dry chemical powder, foam) **Unsuitable:** None known
Specific hazards arising from the chemical	Non-flammable and non-explosive. Product itself does not burn. Reacts violently with strong reducing agents such as aluminium powder (thermite-type reaction) if intimately mixed and ignited.
Special protective actions for fire-fighters	No special measures required specific to this product; use standard fire-fighting protective equipment and self-contained breathing apparatus in smoke-filled areas. **Additional provisions** Not relevant

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	**For non-emergency personnel** Avoid generating and inhaling dust. Use personal protective equipment as per section 8. Ensure adequate ventilation. **For emergency responders** Wear dust mask/respirator and standard PPE. No special hazard for emergency responders beyond dust.
Environmental precautions	Prevent large spillages from entering drains or watercourses to avoid turbidity/sediment impact; not otherwise classified as an environmental hazard.
Methods and materials for containment and cleaning up	Sweep or vacuum up (avoid dry sweeping that raises dust; use wet methods or a vacuum with HEPA filtration where possible) and place in suitable containers for reuse or disposal.
Reference to other sections	See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use
Avoid generating and inhaling dust. Use local exhaust ventilation during bagging/bulk transfer operations.

B. Technical recommendations for the prevention of fires and explosions
Not applicable – product is non-combustible; no special fire/explosion prevention measures required.

C. Technical recommendations on general occupational hygiene
Wash hands after handling. Avoid eating, drinking or smoking in work areas where dust is present.

D. Technical recommendations to prevent environmental risks
Prevent spillage from entering drains or watercourses.

Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Minimum Temp.	Ambient
Maximum Temp.	Ambient (no specific limit – thermally stable)
Maximum time	Indefinite in sealed original containers, kept dry

B. General conditions for storage
Store in closed bags/containers in a dry, well-ventilated place away from strong reducing agents (e.g. powdered aluminium/magnesium).

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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Iron oxide dust/fume is treated as a Particulate Not Otherwise Classified under general industrial hygiene guidance; the following indicative limits (commonly referenced internationally for iron oxide dust/fume, respirable as Fe) are provided as a general guide.

Identification	Occupational Exposure Limit Type	Value
Iron Oxide (as Fe) CAS: 1309-37-1	Time Weighted average concentration (8 hrs) – total dust	~10 mg/m³ (general PNOC guideline)
	Time Weighted average concentration (8 hrs) – respirable fraction	~5 mg/m³ (general PNOC guideline)

Appropriate engineering controls

Use local exhaust ventilation/dust extraction during bagging, weighing and bulk transfer to keep airborne dust concentrations below occupational exposure limits.

B. Respiratory protection
Dust mask (P1/P2) recommended when handling powder with inadequate ventilation; use a properly fitted respirator for prolonged or high-dust operations.

C. Specific protection for the hands
Protective gloves recommended for prolonged handling.

D. Eye and face protection
Safety glasses or dust goggles to prevent particulate contact with eyes.

E. Bodily protection
Normal industrial work clothing; coveralls recommended for dusty operations.

F. Additional emergency measures
Eyewash station recommended in the work area.

Environmental exposure controls
No special measures required beyond good housekeeping and containment of spillage.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state at 20°C	Solid (fine powder)
Appearance	Fine powder
Color	Red to reddish-brown
Odor	Odorless
Odour threshold	Not relevant *
Volatility	
Boiling point at atmospheric pressure	Not relevant (solid, decomposes/sublimes only at very high temperature)
Vapour pressure at 20°C	Negligible
Evaporation rate at 20°C	Not relevant *
Product Description	
Density / Relative density at 20°C	~5.0 – 5.25 g/cm³
Dynamic / Kinematic viscosity	Not relevant (solid)
Concentration	≥ 96% Fe_2O_3 (typical pigment grade)
pH	~6 – 8 (10% aqueous suspension)
Vapour density at 20°C	Not relevant *
Partition coefficient n-octanol/water 20°C	Not applicable (inorganic solid)
Solubility in water at 20°C	Insoluble
Decomposition temperature	Not relevant (thermally stable to very high temperature)
Melting point/freezing point	~1565°C
Flammability	
Flash Point	Non-applicable (inorganic solid)
Flammability (solid, gas)	Non-flammable
Autoignition temperature	Non-applicable
Lower / Upper flammability limit	Non-applicable
Particle Characteristics	
Median equivalent diameter	~0.2 – 1 µm (typical pigment grade, grade dependent)

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

Other information

Explosive properties	Not explosive
Oxidising properties	Not classified as oxidising under GHS criteria
Corrosive to metals	Not corrosive
Heat of combustion	Not relevant (non-combustible)
Surface tension at 20°C	Not relevant (solid)
Refraction index	Not established

10. STABILITY AND REACTIVITY

Reactivity

Chemically unreactive under normal conditions. Can react exothermically (thermite-type reaction) with strong reducing agents such as finely divided aluminium or magnesium powder if intimately mixed and ignited.

Chemical stability

Chemically stable under the indicated conditions of storage, handling and use.

Possibility of hazardous reactions

Under the specified conditions, hazardous reactions that lead to excessive temperatures or pressure are not expected.

Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Not applicable (thermally stable)	Not applicable	No particular hazard

Incompatible materials

Strong Reducing Agents (Al, Mg powder)	Strong Acids
Avoid intimate mixing – exothermic (thermite) reaction risk if ignited	Slowly soluble; avoid unnecessary contact

Hazardous decomposition products

None under normal conditions.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Iron oxide red is an inert, insoluble inorganic pigment with a well-documented low order of toxicity. In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse effects may result depending on the means of exposure:

A. Ingestion (acute effect)

Low acute oral toxicity; not expected to be harmful in normal handling.

B. Inhalation (acute effect)

Dust may cause mechanical irritation of the respiratory tract. Chronic excessive inhalation of iron oxide dust/fume (e.g. in welding/foundry settings) has been associated with siderosis (benign pneumoconiosis).

C. Contact with skin and eyes (acute effect)

Generally non-irritating; dust may cause mechanical irritation of the eyes.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)

Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met for iron oxide red based on available data. IARC: Not classifiable/not listed for this substance (relevant IARC evaluations concern welding fume and crystalline silica contaminants, not the pigment itself).

E. Sensitizing effects

Classification criteria for respiratory or skin sensitisation are not met based on available data.

F. Specific target organ toxicity (STOT) – single exposure

Classification criteria are not met based on available data.

G. Specific target organ toxicity (STOT) – repeated exposure

Classification criteria are not met based on available data; see note on siderosis above for chronic high-dust occupational settings.

H. Aspiration hazard

Not relevant (solid powder).

Product-specific toxicological information

Identification	Acute Toxicity	Genus
Iron(III) Oxide CAS: 1309-37-1	LD50 oral: > 10,000 mg/kg (typical, literature range)	Rat
	LD50 dermal: > 2,000 mg/kg (practically non-toxic)	Rabbit

12. ECOLOGICAL INFORMATION

Not classified as hazardous to the aquatic environment.

Toxicity

Identification	Acute Toxicity	Species	Genus
Iron(III) Oxide CAS: 1309-37-1	LC50: > 100 mg/L (96h, practically non-toxic, low aqueous solubility)	Not specified	Fish
	EC50: > 100 mg/L (48h)	Not specified	Crustacean (Daphnia)

Persistence and degradability

Not applicable – inorganic substance; biodegradation is not a relevant endpoint.

Bioaccumulative potential

Not expected to bioaccumulate; iron is an essential trace element and is homeostatically regulated in organisms.

Mobility in soil

Koc	Henry	Dry Soil	Moist Soil
Not relevant (insoluble solid)	Not relevant	Low mobility	Low mobility

Results of PBT and vPvB assessment

Not applicable – inorganic substance; PBT/vPvB criteria are not designed for this substance class.

Other adverse effects

Excessive discharge may cause discoloration/turbidity of receiving waters.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Not classified as hazardous waste. Dispose of via a licensed waste contractor or landfill in accordance with local regulations; avoid discharge to watercourses. Empty containers should be disposed of/recycled per local regulations.

Refer to national and local regulations on waste management.

14. TRANSPORT INFORMATION

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

14.1 UN number	Not assigned
14.2 UN proper shipping name	Non-hazardous for transport
14.3 Transport hazard class(es)	Not classified
14.4 Packing group	N/A
14.5 Environmental hazard	No
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	Not assigned
14.2 UN proper shipping name	Non-hazardous for transport
14.3 Transport hazard class(es)	Not classified
14.4 Packing group	N/A
14.5 Marine pollutant	No
14.6 Special precautions for user	Not applicable
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	Not assigned
14.2 UN proper shipping name	Non-hazardous for transport
14.3 Transport hazard class(es)	Not classified
14.4 Packing group	N/A
14.5 Environmental hazard	No
14.6 Special precautions for user	Not applicable
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

15. REGULATORY INFORMATION

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.

Other legislation

The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)

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

Not applicable – product is not classified as hazardous under GHS criteria; no hazard statements apply.

Advice related to training

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources

Publicly available GHS classification references and standard industrial chemical data compilations for iron(III) oxide (CAS 1309-37-1).

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 | PNOC: Particulate Not Otherwise Classified | IARC: International Agency for Research on Cancer

Disclaimer: 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.

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