SAFETY DATA SHEET

TRI SODIUM PHOSPHATE

CAS No.: 7601-54-9 (anhydrous)

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

TRI SODIUM PHOSPHATE
TSP; Trisodium Orthophosphate; Sodium Phosphate Tribasic (commonly supplied as the dodecahydrate, $Na_3PO_4 \cdot 12H_2O$, CAS 10101-89-0)
CAS: 7601-54-9 (anhydrous)

Other means of identification

Not relevant

Recommended use of the chemical and restrictions on use

Relevant uses: Detergent/cleaning agent builder, degreaser, boiler and cooling water treatment (scale/corrosion control, pH buffering), food-grade buffering/emulsifying agent (E339), stain and grease removal in industrial cleaning. For industrial user only.
Uses advised against: All uses not specified in this section or in section 7.3.

Supplier's details

SURAJ CHEMICALS
No 92, Govindappa Naicken Street, Shiva Complex, Chennai – 600001, Tamil Nadu, India
Tel: +91 - 7092722822, +91 - 9840284032 / +91 - 44 - 25393652, 42130281
Email: sales@surajchemicals.com | Website: www.surajchemicals.com
GST No: 33ACEPV8190L1ZZ

Emergency phone number

Emergency Contact No: +91 - 7092722822, +91 - 9840284032

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).

Skin Irrit. 2	Skin irritation, Category 2, H315
Eye Dam. 1	Serious eye damage, Category 1, H318

GHS label elements, including precautionary statements

GHS: Danger

Hazard statements

Skin Irrit. 2: H315 – Causes skin irritation.
Eye Dam. 1: H318 – Causes serious eye damage.

Precautionary statements

P264: Wash hands thoroughly after handling.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352: IF ON SKIN: Wash with plenty of water.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER/doctor.
P332+P313: If skin irritation occurs: Get medical advice/attention.
P501: Dispose of contents/container in accordance with local regulations on hazardous waste.

Other hazards which do not result in classification

Concentrated solutions are strongly alkaline. Not a PBT or vPvB substance.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Chemical description: Trisodium orthophosphate (Na_3PO_4)
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 7601-54-9	Trisodium Phosphate — Skin Irrit. 2: H315; Eye Dam. 1: H318 – Danger	≥ 96% (technical grade, as anhydrous basis; typically supplied as dodecahydrate crystal)

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

Request medical assistance immediately, showing the SDS of this product, in case of eye contact or significant exposure.

By inhalation

Remove person to fresh air and keep at rest. Seek medical attention if breathing difficulty or irritation persists.

By skin contact

Remove contaminated clothing. Wash affected skin with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.

By eye contact

Rinse immediately and thoroughly with plenty of water, holding eyelids apart, for at least 15 minutes. Remove contact lenses if present and easy to do. Seek immediate medical/ophthalmological attention.

By ingestion/aspiration

Rinse mouth with water. Do not induce vomiting. Give water to drink if the person is conscious. Seek immediate medical attention.

Most important symptoms/effects, acute and delayed

Causes skin irritation and serious, potentially irreversible eye damage due to its strongly alkaline nature. Acute and delayed effects are also indicated in sections 2 and 11.

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

Treat symptomatically. Ophthalmological evaluation recommended for eye exposures.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Suitable: Product is non-combustible. Use extinguishing media suitable for the surrounding fire (water spray, foam, dry chemical powder, carbon dioxide).
Unsuitable: None known

Specific hazards arising from the chemical

Not flammable, not explosive. Product itself will not burn. On strong heating may release phosphorus oxide fumes.

Special protective actions for fire-fighters

Wear self-contained breathing apparatus and full protective clothing in the event of a significant fire involving this product. Cool fire-exposed containers with water.

Additional provisions

Avoid inhalation of decomposition fumes. Contain fire-fighting water run-off if possible.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Avoid dust generation and contact with skin/eyes. Use personal protective equipment as described in section 8. Ensure adequate ventilation.

For emergency responders

Wear protective equipment (gloves, goggles/face shield). Keep unprotected persons away.

Environmental precautions

Avoid release of large quantities into waterways, as it will raise pH and may harm aquatic life. Notify the relevant authority in case of significant environmental release.

Methods and materials for containment and cleaning up

Sweep up/vacuum spilled material avoiding dust generation, place in a suitable labelled container for reuse or disposal. Wash residual area with water, containing washings for appropriate disposal/neutralisation.

Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use

Avoid contact with skin and eyes and avoid generating dust. Keep away from acids (neutralisation reaction, heat generation).

B. Technical recommendations for the prevention of fires and explosions

Not applicable – product is non-combustible.

C. Technical recommendations on general occupational hygiene

Do not eat, drink or smoke while handling. Wash hands and exposed skin thoroughly after handling.

D. Technical recommendations to prevent environmental risks

Avoid uncontrolled release of large quantities to soil or water bodies. Follow the protective measures given in section 8.

Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Storage temperature	Ambient, dry conditions
Recommended shelf life	24 months in original sealed packaging, stored dry

B. General conditions for storage

Store in a cool, dry, well-ventilated place in tightly closed containers, away from acids and incompatible materials. Keep containers off the floor.

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

No substance-specific occupational exposure limit has been established for trisodium phosphate by OSHA, ACGIH or Indian regulatory bodies. General limits for particulates not otherwise classified are commonly applied as guidance:

Identification	Occupational Exposure Limit Type	Value
Trisodium Phosphate (as inert/nuisance dust guidance) CAS: 7601-54-9	Inhalable fraction, 8-hr TWA	10 mg/m³
	Respirable fraction, 8-hr TWA	3 mg/m³

Appropriate engineering controls

Use local exhaust ventilation where dust is generated. Provide emergency eyewash/shower facilities near handling points due to the eye-damage classification.

B. Respiratory protection

Dust mask/particulate respirator (e.g. N95) recommended during bagging, milling or extended dusty operations.

C. Specific protection for the hands

Chemical-resistant gloves (nitrile or PVC) mandatory when handling.

D. Eye and face protection

Chemical safety goggles or face shield mandatory – product causes serious eye damage.

E. Bodily protection

Chemical-resistant apron/overalls for bagging, loading and mixing operations.

F. Additional emergency measures

Emergency shower and eyewash station mandatory (ANSI Z358-1 / ISO 3864 compliant) in areas of regular handling.

Environmental exposure controls

Avoid environmental spillage of both product and container. See subsection 7.1.D.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state at 20°C	Solid (crystalline powder/granules)
Appearance	White crystalline powder or granules
Color	White
Odor	Odorless
Odour threshold	Not applicable
Volatility	
Boiling point at atmospheric pressure	Not applicable (solid, decomposes on strong heating)
Vapour pressure at 20°C	Not applicable (negligible, solid)
Evaporation rate	Not applicable
Product Description	
Density at 20°C	~2.54 g/cm³ (anhydrous)
Molecular weight	163.94 g/mol (anhydrous, Na_3PO_4)
pH (1% aqueous solution, 20°C)	~11.5–12.0 (strongly alkaline)
Solubility in water at 20°C	Freely soluble (~120 g/L anhydrous basis)
Partition coefficient n-octanol/water	Not applicable (inorganic salt)
Decomposition temperature	Dodecahydrate loses water of crystallisation ~73–76°C
Melting point/freezing point	Not relevant for commercial hydrate grade (see decomposition temperature)
Flammability	
Flash Point	Non-applicable (non-combustible solid)
Flammability (solid, gas)	Non-flammable
Autoignition temperature	Not applicable
Lower / Upper flammability limit	Not applicable
Particle Characteristics	
Median particle size	Grade dependent – available on request

Values are standard published physical constants for trisodium phosphate; exact figures vary slightly between anhydrous and hydrate commercial grades.

Other information

Explosive properties	Not explosive
Oxidising properties	Not an oxidiser
Corrosive to metals	Not classified corrosive to metals; mildly aggressive to aluminium under alkaline solution conditions
Heat of combustion	Not applicable (non-combustible)
Surface tension	Not relevant (solid)
Viscosity	Not applicable (solid)

10. STABILITY AND REACTIVITY

Reactivity

Reacts exothermically with acids (neutralisation). Aqueous solutions are strongly alkaline and may attack aluminium and other amphoteric metals.

Chemical stability

Chemically stable under normal 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, other than heat generation on contact with strong acids.

Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Avoid excessive heat	Not applicable	Avoid prolonged moisture exposure (caking)

Incompatible materials

Strong Acids	Aluminium / Amphoteric Metals	Moisture
Avoid – exothermic neutralisation	Avoid prolonged contact with alkaline solution	Avoid – caking/lump formation

Hazardous decomposition products

Phosphorus oxide fumes on strong heating/combustion of surrounding materials. Non-hazardous under normal use.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

In case of exposure that is repetitive, prolonged, or at concentrations higher than recommended, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect)
Low order of acute oral toxicity, but strongly alkaline – may cause irritation/burns to mouth, throat and gastrointestinal tract if swallowed in concentrated form.

B. Inhalation (acute effect)
Dust may cause irritation of the nose, throat and respiratory tract.

C. Contact with skin and eyes (acute effect)
Causes skin irritation. Causes serious eye damage, potentially irreversible, due to strong alkalinity.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)
Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met based on available data.

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
May cause respiratory irritation from dust; not classified.

G. Specific target organ toxicity (STOT) – repeated exposure
Classification criteria are not met based on available data.

H. Aspiration hazard
Not applicable (solid).

Product-specific toxicological information

Identification	Acute Toxicity	Genus
Trisodium Phosphate CAS: 7601-54-9	LD50 oral: 3,131 mg/kg	Rat
	LD50 dermal: Not established	–

12. ECOLOGICAL INFORMATION

Harmful to aquatic organisms mainly via pH effect at high local concentrations; not classified as acutely toxic under GHS aquatic criteria at typical use concentrations.

Toxicity

Acute Toxicity	Species	Genus
LC50: ~150 mg/L (96h, order-of-magnitude, pH-driven)	Non-applicable	Fish
EC50: Not established	Non-applicable	Crustacean

Persistence and degradability

Not applicable – inorganic salt; phosphate is a naturally occurring nutrient species. Excess phosphate may contribute to eutrophication in receiving waters.

Bioaccumulative potential

Not expected to bioaccumulate (inorganic, water-soluble ionic species).

Mobility in soil

Koc	Henry	Dry Soil	Moist Soil
Not relevant (ionic)	Not relevant	Mobile (soluble)	Mobile, may bind to soil minerals

Results of PBT and vPvB assessment

Non-applicable – not a PBT or vPvB substance.

Other adverse effects

Contributes to nutrient (phosphate) loading if released in large quantities to surface water bodies – discharge should be managed per local effluent regulations.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Neutralise if necessary and dilute with large volumes of water for disposal via authorized effluent treatment systems, or dispose of as non-hazardous/inorganic solid waste, subject to local regulatory approval and phosphate discharge limits. Empty packaging can be recycled or disposed of as non-hazardous waste after ensuring it is empty of residue.

Refer to national and local regulations on waste management.

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14. TRANSPORT INFORMATION

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

14.1 UN number	Not assigned – not regulated as dangerous goods
14.2 UN proper shipping name	Non-applicable
14.3 Transport hazard class(es)	Non-hazardous for transport
14.4 Packing group	N/A
14.5 Environmental hazard	No
14.6 Special precautions for user	None
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG)

14.1 UN number	Not assigned – not regulated as dangerous goods
14.2 UN proper shipping name	Non-applicable
14.3 Transport hazard class(es)	Non-hazardous for transport
14.4 Packing group	N/A
14.5 Marine pollutant	No
14.6 Special precautions for user	None
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO)

14.1 UN number	Not assigned – not regulated as dangerous goods
14.2 UN proper shipping name	Non-applicable
14.3 Transport hazard class(es)	Non-hazardous for transport
14.4 Packing group	N/A
14.5 Environmental hazard	No
14.6 Special precautions for user	None
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

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)
Food Safety and Standards Act, 2006 (where applicable to food-grade material, E339)

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

H315: Causes skin irritation.
H318: Causes serious eye damage.

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

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 chemical safety data for trisodium phosphate (CAS 7601-54-9), including ECHA classification and labelling inventory and standard industry safety data sheets.

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 | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer | PBT: Persistent, Bioaccumulative and Toxic | vPvB: very Persistent, very Bioaccumulative

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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