

HEDP (1-HYDROXYETHYLIDENE-1,1-DIPHOSPHONIC ACID, 60% SOLUTION)

Date of compilation: 02-08-2026 | Revised: 02-08-2026 | Version: 1

SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

HEDP (1-HYDROXYETHYLIDENE-1,1-DIPHOSPHONIC ACID, 60% SOLUTION)  
HEDP Acid; Etidronic Acid; 1-Hydroxyethane 1,1-Diphosphonic Acid  
CAS: 2809-21-4

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Scale and corrosion inhibitor (descalant) and chelating/sequestering agent for water treatment, oilfield and industrial cleaning formulations; stabiliser for peroxide bleaching systems; builder in metal cleaning/pickling formulations. For industrial user only.  
Uses advised against: All uses not specified in this section or in section 7.3.

1.3 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

1.4 Emergency phone number:

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

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 standard, well-documented hazard profile published for HEDP (60% aqueous solution).

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

2.2 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 or doctor/physician.  
P332+P313: If skin irritation occurs: Get medical advice/attention.  
P362+P364: Take off contaminated clothing and wash it before reuse.  
P501: Dispose of contents/container in accordance with local/national regulations on hazardous waste.

2.3 Other hazards which do not result in classification:

Not relevant. The product is a mild/moderately acidic aqueous solution (pH approx. 1–2 as supplied); handle with the same precautions as other acidic aqueous process chemicals.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

**Chemical description:** 1-Hydroxyethylidene-1,1-Diphosphonic Acid (HEDP), supplied as a 60% aqueous solution  
In accordance with Annex 4.3.3 of the GHS, the product contains:

| Identification | Chemical Name / Classification                                                             | Concentration |
|----------------|--------------------------------------------------------------------------------------------|---------------|
| CAS: 2809-21-4 | 1-Hydroxyethylidene-1,1-Diphosphonic Acid — Skin Irrit. 2: H315; Eye Dam. 1: H318 – Danger | 58–62% (w/w)  |
| CAS: 7732-18-5 | Water — Not classified                                                                     | Balance       |

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

3.2 Mixtures:

See 3.1 above – supplied as a single-substance aqueous solution (HEDP in water).

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:

Request medical assistance immediately, showing the SDS of this product.

By inhalation:

Remove the person affected from the area of exposure, provide fresh air and keep at rest. If irritation of the respiratory tract occurs and persists, seek medical attention.

By skin contact:

Remove contaminated clothing and footwear immediately. Wash affected skin with plenty of water for at least 15 minutes. In case of irritation or if symptoms persist, seek medical advice.

By eye contact:

Rinse immediately with plenty of water for at least 15–20 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses, if present and easy to do. Seek immediate medical attention, as serious eye damage may result – do not wait for symptoms to develop.

By ingestion/aspiration:

Do not induce vomiting. Rinse the mouth with water. Give plenty of water to drink if the person is fully conscious. Seek immediate medical attention and show the SDS/container label.

4.2 Most important symptoms/effects, acute and delayed:

Causes skin irritation and serious eye damage on direct contact. Acute and delayed effects are further indicated in sections 2 and 11.

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

Treat symptomatically. In case of eye contact, ophthalmological examination is recommended given the risk of serious eye damage.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

**Suitable:** Water spray/fog, foam, dry chemical powder, carbon dioxide (CO2) – select according to the surrounding fire; the product itself is an aqueous solution and is not flammable.  
**Unsuitable:** None known.

5.2 Specific hazards arising from the chemical:

Non-flammable aqueous solution. Not explosive. On thermal decomposition at high temperature, may release phosphorus oxides and other irritant fumes.

5.3 Special protective actions for fire-fighters:

Wear self-contained breathing apparatus and chemical-protective clothing in case of fire involving this product. Cool fire-exposed containers with water spray.

Additional provisions:

Contain fire-fighting water for appropriate disposal; avoid uncontrolled discharge into drains or water courses.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Avoid contact with skin and eyes. Use personal protective equipment described in Section 8. Ventilate the area. Evacuate non-essential personnel.

For emergency responders:

Wear appropriate acid-resistant PPE as in Section 8. Keep unprotected persons away.

6.2 Environmental precautions:

Avoid release of the product to drains, soil or surface water. Contain spillage and prevent further leakage if safe to do so. Notify the relevant authority in case of significant exposure to the environment.

6.3 Methods and materials for containment and cleaning up:

Contain the spill with inert absorbent material (sand, earth, vermiculite). Neutralise cautiously with a mild alkali (e.g. soda ash/lime) if instructed by site procedure, avoiding violent reaction/heat generation, then collect into a suitable labelled container for disposal. Wash the spill area with plenty of water afterwards.

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:

Avoid contact with skin and especially eyes. Do not breathe mist/vapour from heated or agitated solution. Use only with adequate ventilation. Keep away from strong alkalis and oxidising agents.

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

Non-flammable; no special fire-prevention measures required beyond standard industrial practice.

C. Technical recommendations on general occupational hygiene:

Do not eat, drink or smoke while handling the product. Wash hands and exposed skin thoroughly before breaks and after work.

D. Technical recommendations to prevent environmental risks:

Provide bunding/containment for bulk storage. Avoid release to drains and water courses. Follow protective measures given in Section 8.

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

|               |                                                      |
|---------------|------------------------------------------------------|
| Minimum Temp. | 5°C (avoid freezing)                                 |
| Maximum Temp. | 40°C                                                 |
| Shelf life    | Typical value – refer to current specification sheet |

B. General conditions for storage:

Store in tightly closed, corrosion-resistant (e.g. HDPE/FRP/lined) containers in a cool, dry, well-ventilated area away from strong alkalis, oxidisers and incompatible metals. Avoid direct sunlight and freezing temperatures.

7.3 Specific end use(s):

Except for the instructions already specified, no special recommendation beyond standard industrial practice for descalant/chelating-agent chemicals is required.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

No substance-specific occupational exposure limit (OEL) has been established in India for HEDP. Handle as an irritant/corrosive aqueous chemical, controlling exposure to below levels that cause irritation.

8.2 Appropriate engineering controls:

Use local exhaust ventilation where mist/vapour may be generated (e.g. heated or agitated open vessels), in addition to personal protective equipment (PPE) as needed.

B. Respiratory protection:

Not normally required under good ventilation for routine handling of the solution. Where mist is generated, use a respirator fitted with an acid-gas/particulate filter.

C. Specific protection for the hands:

Chemical-resistant gloves (e.g. nitrile, neoprene or PVC). Replace at any sign of damage or degradation.

D. Eye and face protection:

Chemical splash goggles or a full face shield are required given the serious eye damage hazard – standard safety glasses are not sufficient.

E. Bodily protection:

Acid-resistant apron/protective clothing and footwear for operations with risk of splash.

F. Additional emergency measures:

Emergency shower (ANSI Z358-1) and eyewash stations (ISO 3864-1/4) must be readily available in the work area.

Environmental exposure controls:

Avoid environmental release of both the product and contaminated wash water. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

| Appearance             |              |
|------------------------|--------------|
| Physical state at 20°C | Liquid       |
| Appearance             | Clear liquid |

|                                       |                                                                                            |
|---------------------------------------|--------------------------------------------------------------------------------------------|
| Color                                 | Colourless to pale yellow                                                                  |
| Odor                                  | Slight/characteristic, mild acidic odour                                                   |
| Odour threshold                       | Not established                                                                            |
| Volatility                            |                                                                                            |
| Boiling point at atmospheric pressure | Approx. 100–104°C (aqueous solution; Typical value – refer to current specification sheet) |
| Vapour pressure at 20°C               | Approximates that of water                                                                 |
| Evaporation rate at 20°C              | Approximates that of water                                                                 |
| Product Description                   |                                                                                            |
| Density / Relative density at 20°C    | Approx. 1.33 – 1.37 g/cm³ (Typical value – refer to current specification sheet)           |
| Dynamic / Kinematic viscosity         | Typical value – refer to current specification sheet                                       |
| Concentration                         | 58–62% HEDP active (w/w)                                                                   |
| pH (as supplied, undiluted)           | Approx. 1.0 – 2.0 (Typical value – refer to current specification sheet)                   |
| Vapour density at 20°C                | Approximates that of water                                                                 |
| Partition coefficient n-octanol/water | Log Pow < 0 (highly hydrophilic); Typical value – refer to current specification sheet     |
| Solubility in water at 20°C           | Completely miscible                                                                        |
| Decomposition temperature             | Typical value – refer to current specification sheet                                       |
| Melting point/freezing point          | Approx. 0°C (aqueous solution; Typical value – refer to current specification sheet)       |
| Flammability                          |                                                                                            |
| Flash Point                           | Non-applicable (aqueous solution)                                                          |
| Flammability (solid, gas)             | Not classified as flammable                                                                |
| Autoignition temperature              | Not applicable                                                                             |
| Lower / Upper flammability limit      | Not applicable                                                                             |
| Particle Characteristics              |                                                                                            |
| Median equivalent diameter            | Non-applicable (liquid)                                                                    |

Values above are typical for the commercial grade supplied and are not to be used as product specification. Refer to the current specification sheet for guaranteed values.

9.2 Other information:

|                         |                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Explosive properties    | Not classified as explosive                                                                                                           |
| Oxidising properties    | Not classified as oxidising                                                                                                           |
| Corrosive to metals     | May be mildly corrosive to certain metals (e.g. mild steel) in concentrated, prolonged contact; strong chelating agent for metal ions |
| Heat of combustion      | Not applicable (aqueous solution)                                                                                                     |
| Surface tension at 20°C | Typical value – refer to current specification sheet                                                                                  |

SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:**  
Reacts with strong alkalis (exothermic neutralisation) and may react with strong oxidising agents. As a strong metal-chelating agent, reacts with polyvalent metal ions (e.g. calcium, iron) to form soluble complexes – this is the basis of its intended scale-inhibitor function.
- 10.2 Chemical stability:**  
Chemically stable under the indicated conditions of storage, handling and use.
- 10.3 Possibility of hazardous reactions:**  
Exothermic reaction with strong alkalis. Under specified storage/use conditions, hazardous reactions leading to excessive temperatures or pressure are not otherwise expected.
- 10.4 Conditions to avoid:**

| Shock/Friction | Contact with Air | Increase in Temperature | Sunlight                        | Humidity                          |
|----------------|------------------|-------------------------|---------------------------------|-----------------------------------|
| Not applicable | Not applicable   | Avoid excessive heat    | Avoid prolonged direct exposure | Not applicable (aqueous solution) |

10.5 Incompatible materials:

| Strong Alkalis                            | Strong Oxidisers | Reactive/Light Metals                                | Polyvalent Metal Salts              |
|-------------------------------------------|------------------|------------------------------------------------------|-------------------------------------|
| Avoid contact – exothermic neutralisation | Avoid contact    | Avoid prolonged contact with mild steel/light metals | Reacts/chelates – intended function |

- 10.6 Hazardous decomposition products:**  
Under fire/high-temperature conditions, may release phosphorus oxides and other irritant fumes. Negligible under normal conditions of storage and use.

SECTION 11: TOXICOLOGICAL INFORMATION

- 11.1 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):**  
Classification criteria for acute oral toxicity are not met based on available data; however ingestion of the concentrated solution may cause irritation of the mouth, throat and gastrointestinal tract.
- B. Inhalation (acute effect):**  
Classification criteria for acute inhalation toxicity are not met based on available data. Mist from heated/agitated solution may cause irritation of the respiratory tract.
- C. Contact with skin and eyes (acute effect):**  
Causes skin irritation on direct contact. Causes serious eye damage – direct contact with the concentrated solution can cause significant, potentially irreversible eye injury.
- D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):**  
Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met based on available data. Not listed by IARC as a carcinogen.
- 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.
- H. Aspiration hazard:**

Classification criteria are not met based on available data.

Product-specific toxicological information:

| Identification                        | Acute Toxicity                                                                  | Genus  |
|---------------------------------------|---------------------------------------------------------------------------------|--------|
| HEDP (60% solution)<br>CAS: 2809-21-4 | LD50 oral: >2000 mg/kg (Typical value – refer to current specification sheet)   | Rat    |
|                                       | LD50 dermal: >2000 mg/kg (Typical value – refer to current specification sheet) | Rabbit |

SECTION 12: ECOLOGICAL INFORMATION

Not classified as hazardous to the aquatic environment under GHS criteria based on available data.

12.1 Toxicity:

| Acute Toxicity                                                              | Species        | Genus                      |
|-----------------------------------------------------------------------------|----------------|----------------------------|
| EC50/LC50: >100 mg/L (Typical value – refer to current specification sheet) | Non-applicable | Fish/Aquatic invertebrates |

12.2 Persistence and degradability:

Phosphonates such as HEDP are generally not readily biodegradable by standard OECD test criteria, owing to the stability of the carbon-phosphorus bond, but are of low acute aquatic toxicity. No substance-specific data otherwise available.

12.3 Bioaccumulative potential:

Not expected to bioaccumulate significantly given its high water solubility and low octanol-water partition coefficient. No specific data available.

12.4 Mobility in soil:

| Koc                         | Henry        | Dry Soil      | Moist Soil    |
|-----------------------------|--------------|---------------|---------------|
| Low (high water solubility) | Not relevant | High mobility | High mobility |

12.5 Results of PBT and vPvB assessment:

Not classified as PBT or vPvB based on available data.

12.6 Other adverse effects:

Not described

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:

Neutralise with a mild alkali prior to disposal where permitted by local regulation, or dispose of via a licensed hazardous-waste contractor. Do not discharge directly to drains or water courses without appropriate treatment/authorisation. For packaging: triple-rinse empty containers with water before disposal/recycling, treating rinse water as contaminated waste water.  
Refer to national and local regulations on waste management, including the Hazardous and Other Wastes (Management and Transboundary Movement) Rules.

SECTION 14: TRANSPORT INFORMATION

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

|                                                          |                                                                                                |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------|
| 14.1 UN number                                           | UN3265                                                                                         |
| 14.2 UN proper shipping name                             | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (contains 1-Hydroxyethylidene-1,1-diphosphonic acid) |
| 14.3 Transport hazard class(es)                          | 8                                                                                              |
| 14.4 Packing group                                       | III                                                                                            |
| 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                                           | UN3265                                                                                |
| 14.2 UN proper shipping name                             | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (1-Hydroxyethylidene-1,1-diphosphonic acid) |
| 14.3 Transport hazard class(es)                          | 8                                                                                     |
| 14.4 Packing group                                       | III                                                                                   |
| 14.5 Marine pollutant                                    | No                                                                                    |
| 14.6 Special precautions for user                        | EmS Codes: F-A, S-B   Limited quantities: 5 L   Segregation group: Not relevant       |
| 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                                           | UN3265                                                                                |
| 14.2 UN proper shipping name                             | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (1-Hydroxyethylidene-1,1-diphosphonic acid) |
| 14.3 Transport hazard class(es)                          | 8                                                                                     |
| 14.4 Packing group                                       | III                                                                                   |
| 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                                                                          |

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.

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)  
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

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:**

- 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:**

Published GHS classification and safety data for this CAS number from recognised chemical safety reference databases; The United Nations Economic Commission for Europe (UNECE).

**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 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer | PBT: Persistent, Bioaccumulative and Toxic | vPvB: very Persistent, very Bioaccumulative

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**