# SAFETY DATA SHEET

## PERCHLOROETHYLENE (PERK)

**CAS No.: 127-18-4**

*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**

PERCHLOROETHYLENE (PERK)
Synonyms: Tetrachloroethylene; PCE; Perc; Ethylene tetrachloride
**CAS:** 127-18-4

**Other means of identification**

Not relevant

**Recommended use of the chemical and restrictions on use**

Relevant uses: Dry-cleaning solvent, metal degreasing, chemical intermediate, industrial solvent. For industrial user only.
Uses advised against: All uses not specified in this section or in section 7.3.

**Supplier's details**

**SURAJ CHEMICALS**
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**Emergency phone number**

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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).

| | |
|---|---|
| Carc. 2 | Carcinogenicity, Category 2, H351 |
| Eye Irrit. 2 | Eye irritation, Category 2, H319 |
| Skin Irrit. 2 | Skin irritation, Category 2, H315 |
| STOT SE 3 | Narcotic effects, single exposure, Category 3, H336 |
| Aquatic Chronic 2 | Hazardous to the aquatic environment, chronic hazard, Category 2, H411 |

**GHS label elements, including precautionary statements**

**GHS: Warning**

**Hazard statements**

Carc. 2: H351 – Suspected of causing cancer.
Eye Irrit. 2: H319 – Causes serious eye irritation.
Skin Irrit. 2: H315 – Causes skin irritation.
STOT SE 3: H336 – May cause drowsiness or dizziness.
Aquatic Chronic 2: H411 – Toxic to aquatic life with long lasting effects.

**Precautionary statements**

P201: Obtain special instructions before use.
P260: Do not breathe vapours.
P264: Wash hands thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/eye 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.
P308+P313: IF exposed or concerned: Get medical advice/attention.
P501: Dispose of the contents/containers in accordance with regulations on hazardous waste.

**Other hazards which do not result in classification**

Non-flammable liquid but thermal decomposition (e.g. contact with open flame or hot surfaces) can generate toxic and corrosive gases (hydrogen chloride, phosgene). Does not meet the PBT/vPvB criteria per current assessment.

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

**Substances**

**Chemical description:** Perchloroethylene (Tetrachloroethylene, industrial grade)

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

| Identification | Chemical Name / Classification | Concentration |
|---|---|---|
| CAS: 127-18-4 | Perchloroethylene — Carc. 2: H351; Eye Irrit. 2: H319; Skin Irrit. 2: H315; STOT SE 3: H336; Aquatic Chronic 2: H411 – Warning | ≥ 99.5% |

*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.

**By inhalation**

Remove the person affected from the area of exposure, provide fresh air and keep at rest. High vapour concentrations may cause dizziness, headache and drowsiness. Seek medical attention if symptoms persist.

**By skin contact**

Remove contaminated clothing, wash skin thoroughly with water and soap. Seek medical attention if irritation persists.

**By eye contact**

Rinse eyes thoroughly with lukewarm water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek medical attention.

**By ingestion/aspiration**

Do not induce vomiting (risk of aspiration). Rinse the mouth with water. Seek immediate medical attention, showing the SDS of the product.

**Most important symptoms/effects, acute and delayed**

Acute and delayed effects are indicated in sections 2 and 11.

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

Not relevant

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**

**Suitable:** Water spray/fog, foam, carbon dioxide, dry chemical powder (product itself is non-flammable; select media for surrounding fire)
**Unsuitable:** None known

**Specific hazards arising from the chemical**

Non-flammable liquid. Thermal decomposition or contact with open flame/hot metal surfaces can generate toxic and corrosive fumes including hydrogen chloride and traces of phosgene.

**Special protective actions for fire-fighters**

Evacuate all non-essential personnel. Intervention only by capable personnel who are trained and aware of the hazards of the product. In all cases wear self-contained breathing apparatus. When intervention in close proximity, wear full protective chemical-resistant suit. After intervention, proceed to clean the equipment (take a shower, remove clothing carefully, clean and check).

**Additional provisions**

Cool fire-exposed containers with water spray from a safe distance. Use self-contained breathing apparatus due to toxic decomposition gas risk.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel**

Ventilate the area. Contain the spill (bunding/absorbent) provided there is no additional risk. Use appropriate PPE (see section 8).

**For emergency responders**

Wear protective equipment. Keep unprotected persons away. See section 8.

**Environmental precautions**

Avoid release to drains, watercourses or soil – toxic to aquatic life with long-lasting effects and classified as a priority pollutant in many jurisdictions. Notify the relevant authority in case of significant environmental release.

**Methods and materials for containment and cleaning up**

Absorb with inert non-combustible absorbent material (sand, vermiculite) and place in a labelled, closed container for disposal (preferably for recovery/recycling by distillation).

**Reference to other sections**

See sections 8 and 13.

## 7. HANDLING AND STORAGE

**Precautions for safe handling**

**A. General precautions for safe use**

Use only in well-ventilated areas with local exhaust ventilation, particularly for dry-cleaning/degreasing equipment. Avoid inhalation of vapours and prolonged skin contact. Keep containers tightly closed.

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

No special fire-prevention measures required (non-flammable); keep away from open flame and hot surfaces to prevent thermal decomposition.

**C. Technical recommendations on general occupational hygiene**

Do not eat or drink during the process; wash hands afterwards with suitable cleaning products.

**D. Technical recommendations to prevent environmental risks**

Provide tight electrical equipment well protected against corrosion. Avoid atmospheric emissions. Warn people about the dangers of the product. Follow the protective measures given in the exposure controls/personal protection section. In industrial installations, apply the rules for the prevention of major accidents (consult an expert).

**Conditions for safe storage, including any incompatibilities**

**A. Specific storage requirements**

| | |
|---|---|
| Minimum Temp. | 5°C |
| Maximum Temp. | 35°C (cool, well-ventilated area, away from direct sunlight) |
| Maximum time | 24 Months in original sealed packaging |

**B. General conditions for storage**

Store in a cool, dry, well-ventilated area in tightly closed containers, away from strong oxidizers, reactive metals (e.g. aluminium powder) and sources of heat/open flame. For additional information see subsection 10.5.

**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**

Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):

| Identification | Occupational Exposure Limit Type | Value |
|---|---|---|
| Perchloroethylene<br>CAS: 127-18-4 | ACGIH TLV – TWA (8 hrs) | 25 ppm |
| Perchloroethylene<br>CAS: 127-18-4 | ACGIH TLV – STEL (15 min) | 100 ppm |

**Appropriate engineering controls**

It is recommended to use localized extraction in the work area as a collective protection measure to avoid exceeding occupational exposure limits, in addition to individual protective equipment (PPE) as needed. Consult the manufacturer's information leaflet for storage, use, cleaning and maintenance of PPE.

**B. Respiratory protection**

Organic vapour cartridge respirator where ventilation is insufficient; supplied-air respirator for enclosed spaces or high concentrations.

**C. Specific protection for the hands**

Chemical-resistant gloves (e.g. Viton®, PVA). Note: nitrile/neoprene offer limited breakthrough time against chlorinated solvents.

**D. Eye and face protection**

Chemical splash goggles.

**E. Bodily protection**

Chemical-resistant apron/coveralls for operations with prolonged contact potential.

**F. Additional emergency measures**

Emergency shower (ANSI Z358-1, ISO 3864-1:2011, ISO 3864-4:2011) and eyewash stations (DIN 12 899, ISO 3864-1:2011, ISO 3864-4:2011) should be available.

**Environmental exposure controls**

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

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

| | |
|---|---|
| **Appearance** | |
| Physical state at 20°C | Liquid |
| Appearance | Clear, mobile liquid |
| Color | Colorless |
| Odor | Sweet, ether/chloroform-like |
| Odour threshold | ~1–50 ppm (variable) |
| **Volatility** | |
| Boiling point at atmospheric pressure | 121°C |
| Vapour pressure at 20°C | ~14 mmHg (1.9 kPa) |
| Evaporation rate (n-BuAc = 1) | ~2.8 (moderately fast) |
| **Product Description** | |
| Density / Relative density at 20°C | 1.62 g/cm³ |
| Dynamic / Kinematic viscosity at 20°C | ~0.84 mPa·s |
| Concentration | ≥ 99.5% |
| pH | Not applicable (non-aqueous) |
| Vapour density (air = 1) | ~5.7 (heavier than air) |
| Partition coefficient n-octanol/water (log Pow) | 3.4 |
| Solubility in water at 20°C | ~0.015 g/100mL (150 mg/L, low) |
| Decomposition temperature | Available on request |
| Melting point/freezing point | -22°C |
| **Flammability** | |
| Flash Point | Non-applicable (non-flammable liquid) |
| Flammability (solid, gas) | Non-flammable |
| Autoignition temperature | Not relevant * |
| Lower / Upper flammability limit | Not relevant * |
| **Particle Characteristics** | |
| Median equivalent diameter | Non-applicable (liquid) |

** 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 an oxidizer |
| Corrosive to metals | Can react with certain reactive metals (e.g. aluminium, magnesium powder) forming pyrophoric/reactive compounds |
| Heat of combustion | Not relevant (non-combustible) |
| Surface tension at 20°C | ~32 mN/m |
| Refraction index | ~1.506 |

## 10. STABILITY AND REACTIVITY

**Reactivity**

Reacts with certain active/finely divided metals (e.g. aluminium, magnesium, lithium) which can cause vigorous or violent reaction. Corrodes some metals in the presence of moisture (traces of HCl may form on hydrolysis).

**Chemical stability**

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

**Possibility of hazardous reactions**

Thermal decomposition (heat, flame, hot surfaces, welding operations) can generate hydrogen chloride and traces of phosgene. Under recommended storage conditions no hazardous reactions are expected.

**Conditions to avoid**

| Shock/Friction | Contact with Air | Increase in Temperature | Sunlight | Humidity |
|---|---|---|---|---|
| Not applicable | Not applicable | Avoid open flame/hot surfaces (decomposition risk) | Not applicable | Avoid prolonged moisture contact with metals |

**Incompatible materials**

| Reactive Metals (Al, Mg powder) | Strong Oxidizing Agents | Open Flame / Hot Surfaces |
|---|---|---|
| Avoid contact – vigorous reaction risk | Avoid contact | Avoid – toxic decomposition gases |

**Hazardous decomposition products**

Hydrogen chloride and trace phosgene on thermal decomposition/combustion.

## 11. TOXICOLOGICAL INFORMATION

**Information on toxicological effects**

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

**A. Ingestion (acute effect)**

May cause gastrointestinal irritation and central nervous system depression if swallowed. Acute toxicity classification criteria are not met based on available data.

**B. Inhalation (acute effect)**

Vapours may cause irritation of the respiratory tract, headache, dizziness and drowsiness (narcotic effect) at elevated concentrations; high concentrations may cause unconsciousness.

**C. Contact with skin and eyes (acute effect)**

Causes skin irritation and serious eye irritation. Prolonged/repeated skin contact may cause defatting and dermatitis.

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

Suspected of causing cancer (Carc. 2, H351) based on animal study evidence. IARC: Group 2A (probably carcinogenic to humans). Classification criteria for 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 drowsiness or dizziness (H336) due to narcotic vapour effects at high concentrations.

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

Repeated/prolonged exposure has been associated with liver and kidney effects and CNS effects in occupational studies; classification criteria under GHS STOT RE are not formally met at current harmonized classification based on available data.

**H. Aspiration hazard**

Classification criteria are not met based on available data.

**Product-specific toxicological information**

| Identification | Acute Toxicity | Genus |
|---|---|---|
| Perchloroethylene (Tetrachloroethylene, industrial grade)<br>CAS: 127-18-4 | LD50 oral: 2629 mg/kg | Rat |
| | LD50 dermal: >5000 mg/kg | Rabbit |
| | LC50 inhalation: 5200 ppm (4h) | Rat |

## 12. ECOLOGICAL INFORMATION

**Toxic to aquatic life with long lasting effects.**

**Toxicity**

| Identification | Acute Toxicity | Species | Genus |
|---|---|---|---|
| Perchloroethylene<br>CAS: 127-18-4 | LC50: 5.28 mg/L (96h) | Pimephales promelas | Fish |
| | EC50: 18.0 mg/L (48h) | Daphnia magna | Crustacean |

**Persistence and degradability**

Not readily biodegradable under standard test conditions; volatilises significantly from water and soil surfaces.

**Bioaccumulative potential**

Moderate bioaccumulation potential (log Pow 3.4); BCF values in fish reported in the range of 30–100 (moderate).

**Mobility in soil**

| Koc | Henry | Dry Soil | Moist Soil |
|---|---|---|---|
| ~150–300 | ~1.8×10⁻² atm·m³/mol (high, volatilises readily from water) | Volatilises | Low solubility, some dissolution |

**Results of PBT and vPvB assessment**

This substance does not meet the PBT/vPvB criteria of Annex XIII.

**Other adverse effects**

Not described

## 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

Recover/recycle by distillation where feasible (common practice for dry-cleaning/degreasing solvent). Otherwise incinerate in a licensed hazardous waste incinerator equipped for halogenated solvent combustion with acid gas scrubbing. For packaging: do not rinse; dispose of as hazardous waste.

Refer to national and local regulations on waste management, including the Hazardous and Other Wastes (Management and Transboundary Movement) Rules.

## 14. TRANSPORT INFORMATION

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

| | |
|---|---|
| 14.1 UN number | UN1897 |
| 14.2 UN proper shipping name | TETRACHLOROETHYLENE |
| 14.3 Transport hazard class(es) | 6.1 |
| 14.4 Packing group | III |
| 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 | UN1897 |
| 14.2 UN proper shipping name | TETRACHLOROETHYLENE |
| 14.3 Transport hazard class(es) | 6.1 |
| 14.4 Packing group | III |
| 14.5 Marine pollutant | Yes |
| 14.6 Special precautions for user | EmS Codes: F-A, S-A \| 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 | UN1897 |
| 14.2 UN proper shipping name | TETRACHLOROETHYLENE |
| 14.3 Transport hazard class(es) | 6.1 |
| 14.4 Packing group | III |
| 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 |

## 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)
The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
Public Liability Insurance Act, 1991

## 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**

H351: Suspected of causing cancer.
H319: Causes serious eye irritation.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H411: 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**

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**

The United Nations Economic Commission for Europe (UNECE); European Chemicals Agency (ECHA) classification and labelling inventory; ACGIH Threshold Limit Values.

**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 | COD: Chemical Oxygen Demand | BOD5: 5-day biochemical oxygen demand | BCF: Bioconcentration factor | 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

**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.

*(This document is computer generated and therefore does not require any signature.)*