1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name AMMONIUM PERSULFATE
CAS-No 7727-54-0
Synonyms Ammonium Peroxydisulfate; Diammonium Peroxydisulphate; Peroxydisulfuric acid, diammonium salt; Peroxydisulfuric acid, ammonium salt.

Recommended use of the chemical and restrictions on use

Recommended Use: Polymerization initiator; Etchant and cleaner for printed circuit boards; Hair bleaching formulations; Secondary oil recovery; Oxidizing agent for a variety of organic reactions

Restrictions on Use No uses to be advised against were identified.

Manufacturer/Supplier

Evonik Active Oxygens, LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
Phone: +1 267/ 422-2400 (General Information)
E-Mail: Product-regulatory-services@evonik.com

Emergency telephone numbers

For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)
+1 303/ 389-1409 (Medical - U.S. - Call Collect)
AMMONIUM PERSULFATE

SDS #: 7727-54-0-US
Revision date: 2021-10-14
Version 1.06

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Oral</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 2</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2B</td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Category 3</td>
</tr>
<tr>
<td>Oxidizing Solids</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Danger

Hazard Statements
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 - May cause respiratory irritation
H320 - Causes eye irritation
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H302 - Harmful if swallowed
H272 - May intensify fire; oxidizer

Precautionary Statements - Prevention
P261 - Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray
P285 - In case of inadequate ventilation wear respiratory protection
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/ protective clothing
P264 - Wash face, hands and any exposed skin thoroughly after handling
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P220 - Keep away from clothing and other combustible materials

Precautionary Statements - Response
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/ attention
P302 + P352 - IF ON SKIN: Wash with plenty of water.
P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention
P362 - Take off contaminated clothing and wash before reuse
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
P330 - Rinse mouth
P370 + P378 - In case of fire: Use water for extinction
AMMONIUM PERSULFATE

Precautionary Statements - Storage
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

Hazards not otherwise classified (HNOC)
No hazards not otherwise classified were identified.

Other Information
Risk of decomposition by heat or by contact with incompatible materials

Unknown acute toxicity
0% of the mixture consists of ingredient(s) of unknown toxicity

4. FIRST AID MEASURES

General Advice
Remove from exposure, lie down. Show this material safety data sheet to the doctor in attendance.

Eye Contact
Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids intermittently. Consult a physician. In case of contact, immediately flush eyes with plenty of water. If symptoms persist, call a physician.

Skin Contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if irritation develops and persists.

Inhalation
Remove from exposure, lie down. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

Ingestion
Do NOT induce vomiting. Call a physician or poison control center immediately. Rinse mouth. Drink 1 or 2 glasses of water.

Most important symptoms and effects, both acute and delayed
Itching; Redness; Coughing and/ or wheezing.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Persulfate</td>
<td>7727-54-0</td>
<td>&gt; 98</td>
</tr>
<tr>
<td>Ammonium sulfate</td>
<td>7783-20-2</td>
<td>&lt; 2</td>
</tr>
</tbody>
</table>

Formula
H8N2O6S2
AMMONIUM PERSULFATE

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water. Cool containers with flooding quantities of water until well after fire is out.

Unsuitable extinguishing media
Do not use carbon dioxide or other gas filled fire extinguishers; they will have little effect on decomposing persulfate.

Specific Hazards Arising from the Chemical
Decomposes under fire conditions to release oxygen that intensifies the fire.

 Explosion data
Sensitivity to Mechanical Impact
Not sensitive.
Sensitivity to Static Discharge
Not sensitive.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Keep off any unprotected persons. Avoid contact with the skin and the eyes. Avoid breathing dust. Wear personal protective equipment.

Other
Never add other substances or combustible waste to product residues.

Environmental Precautions
Knock down dust with water spray. Avoid penetration into waterways, sewers, soil or groundwater. Local authorities should be advised if significant spillages cannot be contained.

Methods for Containment
Vacuum, shovel or pump waste into a drum and label contents for disposal. Avoid dust formation. Store in closed container.

Methods for cleaning up
Clean up spill area and treat as special waste. Dispose of waste as indicated in Section 13.

7. HANDLING AND STORAGE

Handling
Wear personal protective equipment. Avoid breathing dust. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Avoid contact with skin and eyes. Remove and wash contaminated clothing before re-use.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Do not store near combustible materials. Avoid contamination of opened product. Keep away from food, drink and animal feedingstuffs. Avoid formation and deposition of dust.

Incompatible products
Bases, Halides, Oxidizing agents, Strong reducing agents, Combustible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Persulfate 7727-54-0</td>
<td>TWA: 0.1 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>British Columbia</th>
<th>Quebec</th>
<th>Ontario TWAEV</th>
<th>Alberta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Persulfate 7727-54-0</td>
<td>TWA: 0.1 mg/m³</td>
<td>-</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
</tr>
</tbody>
</table>
Appropriate engineering controls

Engineering measures
Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Eye/Face Protection
Eye protection recommended. Chemical goggles consistent with EN 166 or equivalent.

Skin and Body Protection
Wear long-sleeved shirt, long pants, socks, and shoes.

Hand Protection
Protective gloves: Neoprene gloves, Polyvinylchloride, Natural Rubber.

Respiratory Protection
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn: particulate filtering facepiece respirators.

Hygiene measures
Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Wash hands before breaks and after shifts. Keep work clothes separate, remove contaminated clothing - launder after open handling of product.

General information
Protective engineering solutions should be implemented and in use before personal protective equipment is considered.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Crystalline solid</td>
</tr>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
</tr>
<tr>
<td>Odor</td>
<td>odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not applicable</td>
</tr>
<tr>
<td>pH</td>
<td>5.2 (1% solution)</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>120 °C (Decomposes)</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>Decomposes on heating</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper flammability limit:</td>
<td>No information available</td>
</tr>
<tr>
<td>Lower flammability limit:</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>1.47E-23 mm Hg at 25°C</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
</tr>
<tr>
<td>Density</td>
<td>1.98 g/cm³ (crystal density)</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>No information available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>45.9 % @ 25 °C</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>No information available</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No evidence of combustion up to 600°C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt; 100 °C (assume)</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No information available (Solid)</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No information available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>oxidizer</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>228.2</td>
</tr>
<tr>
<td>Bulk density</td>
<td>1.05 g/cm³ (loose)</td>
</tr>
</tbody>
</table>
11. TOXICOLOGICAL INFORMATION

Unknown acute toxicity 0% of the mixture consists of ingredient(s) of unknown toxicity

LD50 Oral 740 mg/kg (rat) (Ammonium Persulfate)
LD50 Dermal > 2000 mg/kg (rat) (Ammonium Persulfate)
LC50 Inhalation > 2.95 mg/L (rat) (4-hr) (Ammonium Persulfate)

Serious eye damage/eye irritation Irritating to eyes.
Skin corrosion/irritation Minimally irritating.

Component Information

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
<th>NOAEL Oral Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Persulfate (7727-54-0)</td>
<td>495 mg/kg ( Rat )</td>
<td>&gt;2,000 mg/kg (rat)</td>
<td>520 mg/L ( Rat ) 1 h</td>
<td></td>
</tr>
<tr>
<td>Ammonium sulfate (7783-20-2)</td>
<td>2840 mg/kg ( Rat )</td>
<td>&gt;2000 mg/kg ( Rat )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms Symptoms of allergic reaction may include rash, itching, swelling and trouble breathing.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity Did not show carcinogenic effects in animal experiments.
AMMONIUM PERSULFATE

Mutagenicity

In vivo tests did not show mutagenic effects.

Reproductive toxicity

This product is not recognized as reprotox by Research Agencies.

STOT - single exposure

May cause respiratory irritation.

STOT - repeated exposure

Not classified.

Subchronic toxicity

Oral (NOAEL) = 41.1 mg/kg bw (Ammonium Persulfate)
Inhalation (NOAEC) = 10.3 mg/m³ (Ammonium Persulfate)
Dermal: No data available

Target organ effects

Eyes, Skin, Respiratory System.

Aspiration hazard

No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects

<table>
<thead>
<tr>
<th>Active Ingredient(s)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Persulfate</td>
<td>96 h LC50</td>
<td>Onchorhyncus mykiss</td>
<td>76.3</td>
<td>mg/L</td>
</tr>
<tr>
<td>Ammonium Persulfate</td>
<td>48 h EC50</td>
<td>Water flea</td>
<td>120</td>
<td>mg/L</td>
</tr>
<tr>
<td>Ammonium Persulfate</td>
<td>72 h EC50</td>
<td>Marine algae (Phaeodactylym tricornutum)</td>
<td>136</td>
<td>mg/L</td>
</tr>
<tr>
<td>Ammonium Persulfate</td>
<td>96 h LC50</td>
<td>Turbot (Scophthalmus maximus)</td>
<td>107.6</td>
<td>mg/L</td>
</tr>
<tr>
<td>Ammonium Persulfate</td>
<td>18 h EC10</td>
<td>Pseudomonas putida</td>
<td>36</td>
<td>mg/L</td>
</tr>
<tr>
<td>Ammonium Persulfate</td>
<td>5 d</td>
<td>Abra Alba</td>
<td>11</td>
<td>mg/L</td>
</tr>
<tr>
<td>Ammonium Persulfate</td>
<td>96 h LC50</td>
<td>Grass shrimp</td>
<td>391</td>
<td>mg/L</td>
</tr>
<tr>
<td>Ammonium Persulfate</td>
<td>24 h EC50</td>
<td>Daphnia magna</td>
<td>635.7</td>
<td>mg/L</td>
</tr>
</tbody>
</table>

Persistence and degradability

Biodegradability does not pertain to inorganic substances.

Bioaccumulation

Does not bioaccumulate.

Mobility

Dissociates into ions.

Other Adverse Effects

None known.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261). It must undergo special treatment, e.g. at suitable disposal site, to comply with local regulations.

US EPA Waste Number

D001.

Contaminated Packaging

Dispose of in accordance with local regulations.

14. TRANSPORT INFORMATION
AMMONIUM PERSULFATE

DOT

| UN/ID no   | 1444 |
| Proper Shipping Name | AMMONIUM PERSULFATE |
| Hazard class   | 5.1 |
| Packing Group  | III |

TDG

| UN/ID no   | 1444 |
| Proper Shipping Name | AMMONIUM PERSULFATE |
| Hazard class   | 5.1 |
| Packing Group  | III |

ICAO/IATA

| UN/ID no   | 1444 |
| Proper Shipping Name | AMMONIUM PERSULFATE |
| Hazard class   | 5.1 |
| Packing Group  | III |

IMDG/IMO

| UN/ID no   | 1444 |
| Proper Shipping Name | AMMONIUM PERSULFATE |
| Hazard class   | 5.1 |
| Packing Group  | III |

ADR/RID

| UN/ID no   | 1444 |
| Proper Shipping Name | AMMONIUM PERSULFATE |
| Hazard class   | 5.1 |
| Packing Group  | III |

ADN

| Proper Shipping Name | AMMONIUM PERSULFATE |
| Hazard class   | 5.1 |
| Packing Group  | III |

OTHER INFORMATION

Protect from physical damage. Do not store near acids, moisture or heat.

15. REGULATORY INFORMATION

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories
This product has the following hazards that are reportable under The Emergency Planning and Community Right-to-Know rule (EPCRA Tier II):

- Oxidizer
- Acute toxicity
- Serious eye damage/eye irritation
- Skin corrosion/irritation
- Respiratory/skin sensitization
- Specific Target Organ Toxicity (STOT) - Single Exposure

Clean Water Act
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA/EPCRA
AMMONIUM PERSULFATE

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

U.S. State Right-to-Know Regulations
This product contains the following substances regulated under state Right-to-Know laws:

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Persulfate</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium sulfate</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

California Proposition 65
This product does not contain any Proposition 65 chemicals.

CANADA

Environmental Emergencies
This product contains no substances listed under Canada's Environmental Emergency regulations.

Canadian National Pollutant Release Inventory
This product contains no substances reportable under Canada's National Pollutant Release Inventory regulations.

International Inventories

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>TSCA (United States)</th>
<th>DSL (Canada)</th>
<th>EINECS/EL INC5 (Europe)</th>
<th>ENCS (Japan)</th>
<th>China (IECSC)</th>
<th>KECL (Korea)</th>
<th>PICCS (Philippines)</th>
<th>AICS (Australia)</th>
<th>NZIoC (New Zealand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Persulfate</td>
<td>X</td>
<td>X</td>
<td>231-786-5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ammonium sulfate</td>
<td>X</td>
<td>X</td>
<td>231-984-1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

All ingredients are directly listed on the active TSCA Inventory

Mexico

Mexico - Grade
Slight risk, Grade 1

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Stability</th>
<th>Special Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>OX</td>
</tr>
<tr>
<td>Hazards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Physical hazard</th>
<th>Special precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>J</td>
</tr>
<tr>
<td>Hazards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NFPA/HMIS Ratings Legend
Special Hazards: OX = Oxidizer
Protection=J (Safety goggles, gloves, apron, combination dust and vapor respirator)

Revision date: 2021-10-14
Revision note: Manufacturer name changed.
Issuing Date: 2021-02-17

Disclaimer
This information and any recommendations, technical or otherwise, are presented in good faith and believed to be correct as of the date prepared. Recipients of this information and recommendations must make their own determination as to its suitability for their purposes. In no event shall Evonik assume liability for damages or losses of any kind or nature that result from the use of or reliance upon this information and recommendations. EVONIK EXPRESSLY DISCLAIMS ANY REPRESENTATION AND WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, NON-INFRINGEMENT, MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE (EVEN IF EVONIK IS AWARE OF SUCH PURPOSE) WITH RESPECT TO ANY INFORMATION AND RECOMMENDATIONS PROVIDED. Reference to any trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product and does not imply that similar products could not be used. Evonik reserves the right to make any changes to the information and/or recommendations at any time, without prior or subsequent notice.

Prepared By:

Evonik

© 2021 Evonik. All Rights Reserved.

End of Safety Data Sheet