1. Identification

**Product identifier** AMMONIUM PERCHLORATE, REAGENT

**Other means of identification**
- **Product code**: 3

**Recommended use** professional, scientific and technical activities: other professional, scientific and technical activities

**Recommended restrictions** None known.

**Manufacturer/Importer/Supplier/Distributor information**

<table>
<thead>
<tr>
<th><strong>Manufacturer</strong></th>
<th><strong>Importer/Supplier/Distributor</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company name</strong></td>
<td>GFS Chemicals, Inc.</td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td>P.O. Box 245, Powell, OH 43065</td>
</tr>
<tr>
<td><strong>Telephone</strong></td>
<td>Phone 740-881-5501, Toll Free 800-858-9682, Fax 740-881-5989</td>
</tr>
<tr>
<td><strong>Website</strong></td>
<td><a href="http://www.gfschemicals.com">www.gfschemicals.com</a></td>
</tr>
<tr>
<td><strong>E-mail</strong></td>
<td><a href="mailto:service@gfschemicals.com">service@gfschemicals.com</a></td>
</tr>
<tr>
<td><strong>Emergency phone number</strong></td>
<td>Emergency Assistance 800-424-9300</td>
</tr>
</tbody>
</table>

2. Hazard(s) identification

<table>
<thead>
<tr>
<th><strong>Physical hazards</strong></th>
<th>Oxidizing solids</th>
<th>Category 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health hazards</strong></td>
<td>Serious eye damage/eye irritation</td>
<td>Category 2A</td>
</tr>
<tr>
<td></td>
<td>Specific target organ toxicity, repeated exposure</td>
<td>Category 1</td>
</tr>
<tr>
<td><strong>Environmental hazards</strong></td>
<td>Not classified.</td>
<td></td>
</tr>
<tr>
<td><strong>OSHA defined hazards</strong></td>
<td>Not classified.</td>
<td></td>
</tr>
</tbody>
</table>

**Label elements**

- Signal word: Danger
- Hazard statement: May cause fire or explosion; strong oxidizer. Causes serious eye irritation. Causes damage to organs through prolonged or repeated exposure.
- Precautionary statement
  - **Prevention**: Keep away from heat. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Do not subject to grinding/shock/friction. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection.
  - **Response**: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If on clothing: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Call a POISON CENTER or doctor/physician if you feel unwell. Get medical advice/attention if you feel unwell. If eye irritation persists: Get medical advice/attention. In case of fire: Use water to extinguish. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  - **Storage**: Store in a well-ventilated place. Keep container tightly closed. Do not store near combustible materials. Store locked up.
  - **Disposal**: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

**Hazard(s) not otherwise classified (HNOC)** None known.
3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIUM PERCHLORATE</td>
<td></td>
<td>7790-98-9</td>
<td>100</td>
</tr>
</tbody>
</table>

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

**Inhalation**
Move to fresh air. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician if symptoms develop or persist.

**Skin contact**
IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Wash off with soap and water. Get medical attention if irritation develops and persists. For minor skin contact, avoid spreading material on unaffected skin.

**Eye contact**
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

**Ingestion**
Rinse mouth. Get medical attention if symptoms occur.

5. Fire-fighting measures

**Suitable extinguishing media**

**Unsuitable extinguishing media**
Do not use water jet as an extinguisher, as this will spread the fire.

**Specific hazards arising from the chemical**
Greatly increases the burning rate of combustible materials. Containers may explode when heated. During fire, gases hazardous to health may be formed.

**Special protective equipment and precautions for firefighters**
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire fighting equipment/instructions**
In case of fire and/or explosion do not breathe fumes. In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.

**Specific methods**
Cool containers exposed to flames with water until well after the fire is out.

**General fire hazards**
May cause fire or explosion; strong oxidizer. Contact with combustible material may cause fire.

6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Keep away from clothing and other combustible materials. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

**Methods and materials for containment and cleaning up**
Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Ventilate the contaminated area. Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Minimize dust generation and accumulation. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. Wear appropriate protective equipment and clothing during clean-up.
Environmental precautions
Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling
Keep away from heat. Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Avoid contact with eyes. When using, do not eat, drink or smoke. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Keep away from heat. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Do not store near combustible materials. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits
No exposure limits noted for ingredient(s).

Biological limit values
No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls
Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station.

Individual protection measures, such as personal protective equipment

Eye/face protection
Wear safety glasses with side shields (or goggles).

Skin protection
Hand protection
Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier. Frequent change is advisable.

Other
Use of an impervious apron is recommended. Wear fire/flame resistant/retardant clothing.

Respiratory protection
In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations
Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance
Physical state
Solid.
Form
Solid.
Color
White.
Odor
Odorless.
Odor threshold
Not available.

pH
Not available.

Melting point/freezing point
266 °F (130 °C)

Initial boiling point and boiling range
Not available.

Flash point
Not available.

Evaporation rate
Not available.

Flammability (solid, gas)
Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)
Not available.
Flammability limit - upper (%)
Not available.
Explosive limit - lower (%)
Not available.
Explosive limit - upper (%)
Not available.

Vapor pressure
Not available.

Vapor density
Not available.
Relative density
Solubility(ies)
  Solubility (water)
Partition coefficient
  (n-octanol/water)
Auto-ignition temperature
Decomposition temperature
Viscosity
Other information
  Density
  Molecular formula
  Molecular weight
  Specific gravity

10. Stability and reactivity
Reactivity
Chemical stability
Possibility of hazardous reactions
Conditions to avoid
Incompatible materials
Hazardous decomposition products

11. Toxicological information
Information on likely routes of exposure
  Inhalation
  Skin contact
  Eye contact
  Ingestion
Symptoms related to the physical, chemical and toxicological characteristics
Information on toxicological effects
Acute toxicity
Product
  AMMONIUM PERCHLORATE (CAS 7790-98-9)
  Acute
     Oral
     LD50
     Guinea pig
     Rabbit
     Rat
  Test Results
    3310 mg/kg
    1900 mg/kg
    4200 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation
Serious eye damage/eye irritation
Respiratory or skin sensitization
  Respiratory sensitization
  Skin sensitization
  Germ cell mutagenicity
  Carcinogenicity
  Reproductive toxicity
  Specific target organ toxicity

Material name: AMMONIUM PERCHLORATE, REAGENT
Version #: 01
Revision date: Issue date: June-16-2015
Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure. The perchlorate ion competes with iodide in the mechanism that governs uptake into the thyroid gland for growth hormone production. This effect is routinely countered by ensuring sufficient dietary intake of iodine, as perchlorate does not accumulate in the body. Studies on workers in plants where perchlorates are manufactured have shown no thyroid abnormalities; various clinical studies are ongoing. Perchlorates occur naturally in trace amounts in the environment, and are not classified as carcinogenic.

Aspiration hazard
Not available.

Chronic effects
Causes damage to organs through prolonged or repeated exposure.

12. Ecological information

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability
No data is available on the degradability of this product.

Bioaccumulative potential
No data available.

Mobility in soil
No data available.

Other adverse effects
No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations
Dispose in accordance with all applicable regulations.

Hazardous waste code
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging
Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT
UN number UN1442
UN proper shipping name Ammonium perchlorate
Transport hazard class(es)
Class 5.1
Subsidiary risk -
Label(s) 5.1
Packing group II
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Special provisions 107, A9, IB6, IP2, T3, TP33
Packaging exceptions 152
Packaging non bulk 212
Packaging bulk 242

IATA
UN number UN1442
UN proper shipping name Ammonium perchlorate
Transport hazard class(es)
Class 5.1
Subsidiary risk -
Packing group II
Environmental hazards No.
ERG Code 5L
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Other information Passenger and cargo aircraft Allowed.
Cargo aircraft only Allowed.

IMDG
UN number UN1442
AMMONIUM PERCHLORATE

Transport hazard class(es)

- Class 5.1
- Subsidiary risk -
- Packing group II
- Environmental hazards
- Marine pollutant No.
- EmS F-H, S-Q
- Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable.

15. Regulatory information

US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)
Not listed.

SARA 304 Emergency release notification
Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

- Immediate Hazard - Yes
- Delayed Hazard - Yes
- Fire Hazard - Yes
- Pressure Hazard - No
- Reactivity Hazard - No

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312
Yes

Hazardous chemical

SARA 313 (TRI reporting)
Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Not regulated.
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Not regulated.
Safe Drinking Water Act (SDWA)
Not regulated.
US state regulations
US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)
Not listed.
US. Massachusetts RTK - Substance List
AMMONIUM PERCHLORATE (CAS 7790-98-9)
US. New Jersey Worker and Community Right-to-Know Act
AMMONIUM PERCHLORATE (CAS 7790-98-9)
US. Pennsylvania Worker and Community Right-to-Know Law
AMMONIUM PERCHLORATE (CAS 7790-98-9)
US. Rhode Island RTK
Not regulated.
US. California Proposition 65
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
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<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date       June-16-2015
Version #        01

Disclaimer
GFS Chemicals cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user’s responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Revision Information
Product and Company Identification: Physical States
Physical & Chemical Properties: Multiple Properties
Transport Information: Proper Shipping Name/Packing Group
Regulatory Information: Safety Phrases
GHS: Classification