SAFETY DATA SHEET

Preparation Date: 5/1/2017 **Revision Date:** Not Applicable **Revision Number:** Not Applicable

1. IDENTIFICATION

Product identifier

Product code: A1224
Product Name: AMMONIUM PERCHLORATE, REAGENT

Other means of identification
Synonyms: Perchloric acid, ammonium salt
CAS #: 7790-98-9
RTECS # SC7520000
CI#: Not available

Recommended use of the chemical and restrictions on use
Recommended use: No information available.
Uses advised against No information available

Supplier:
Spectrum Chemical Mfg. Corp
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000.
Order Online At: https://www.spectrumchemical.com
Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous according to the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Serious eye damage/eye irritation	Category 2B
Explosives	Division 1.1
Oxidizing solids	Category 1

Label elements

Danger

Hazard statements
Causes eye irritation
Explosive; mass explosion hazard
May cause fire or explosion; strong oxidizer

Hazards not otherwise classified (HNOC)
Not Applicable

Other hazards
May be harmful if swallowed

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Ground/bond container and receiving equipment
Do not subject to grinding/shock/ .? /friction
Keep/Store away from clothing and other combustible materials
Take any precaution to avoid mixing with combustibles
Wear fire/flame resistant/retardant clothing
Wear protective clothing
Wear eye/face protection

Precautionary Statements - Response

Explosion risk in case of fire. In case of fire: Evacuate area. DO NOT fight fire when fire reaches explosives. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. IN CASE OF FIRE: Use water to extinguish. Do not use dry chemicals or foams. CO_2 or Halon may provide limited control.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes

Precautionary Statements - Storage
Store in accordance with local regulations

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
Ammonium Perchlorate	7790-98-9	100

4. FIRST AID MEASURES

First aid measures

General Advice: National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222.

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

Eye Contact: Flush eyes with water for 15 minutes. Get medical attention.

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

Most important symptoms and effects, both acute and delayed

Symptoms Mild eye irritation. Mild skin irritation. May cause central nervous system effects. Ataxia. Convulsions. May cause digestive (gastrointestinal) tract irritation. Ingestion may cause nausea, vomiting, and diarrhea. Coughing and wheezing. Dyspnea (Shortness of breath and difficulty breathing).

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically.

Protection of first-aiders
First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Water. CO_2 may be of no value in extinguishing fires involving oxidizers and may only provide limited control.

Unsuitable Extinguishing Media: Dry chemical. Foam. Halons.

Specific hazards arising from the chemical

Hazardous Combustion Products: Nitrogen Oxides. Ammonia. Hydrogen Chloride Gas.

Specific hazards: May cause fire or explosion: strong oxidizer. Keep away from combustible materials (wood, paper, oil, clothing, etc.). May cause fire when in contact with other material. Contact with combustible or organic materials may cause fire. Will accelerate burning when involved in a fire. Container explosion may occur under fire conditions or when heated. Can ignite or explode on exposure to heat, shock, or friction. Can ignite spontaneously.

Special Protective Actions for Firefighters

Specific Methods: For large fires, flood fire area with water from a distance. Cool affected containers with flooding quantities of water. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to risk of explosion. Do not get water inside containers. DO NOT use combustible materials such as sawdust.

Special Protective Equipment 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, protective equipment and emergency procedures

Personal Precautions: Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Remove all sources of ignition. Keep combustibles (wood, paper, oil, clothing, etc.) away from spilled material.

Environmental precautions Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Keep spilled material wet. Cover with plastic sheet to prevent spreading.

Methods for cleaning up Do not use combustible materials such as paper towels, sawdust, clothing, etc. to clean up spill. For small spill:. Wet spilled material before picking it up. Do not attempt to sweep up dry material. Flush area with flooding quantities of water. For large spill:. Do not clean-up or dispose of , except under supervision of a specialist.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:
Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

Safe Handling Advice
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Keep away from combustible material. Keep away from heat and sources of ignition. Do not smoke. Do not breathe dust. Do not ingest. Avoid dust formation. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:
Keep container tightly closed. Keep in a well-ventilated place. Store at room temperature in the original container. Store in a segregated and approved area. Do not store near combustible materials. Store away from incompatible materials.

Incompatible Materials:
Combustible materials
Organic materials
Sulfur
Carbon
Reducing agents
Powdered metals
Strong acids

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Components	CAS-No.	OSHA	NIOSH	ACGIH	AIHA WHEEL
Ammonium Perchlorate	7790-98-9	None	None	None	None

Canada

Components	CAS-No.	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
Ammonium Perchlorate	7790-98-9	None	None	None	None

Australia and Mexico

Components	CAS-No.	Australia	Mexico
Ammonium Perchlorate	7790-98-9	None	None

Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Goggles

Skin and body protection: Chemical resistant apron
Long sleeved clothing
Gloves

Respiratory protection: Effective dust mask. Use a dust respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentration of dust (dust clouds) , inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:
Solid

Appearance:
Crystals. Crystalline.

Color:
White.

Odor:
Odorless.

Taste
No information available.

Formula:
NH4ClO4

Molecular/Formula weight:
117.49

Flammability:
No information available

Flashpoint (°C/°F):
No information available.

Flash Point Tested according to:
Not available

Autoignition Temperature (°C/°F):
No information available

Lower Explosion Limit (%):
No information available

Upper Explosion Limit (%):
No information available

Melting point/range(°C/°F):
130 °C/266 °F

Decomposition temperature(°C/°F):
130 °C/266 °F

Boiling point/range(°C/°F):
No information available

Bulk density:
No information available

Density (g/cm3):
No information available

Specific gravity:
1.95

pH:
No information available

Vapor pressure @ 20°C (kPa):
No information available

Evaporation rate:
No information available

Vapor density:
No information available

VOC content (g/L):
No information available

Odor threshold (ppm):
No information available

Partition coefficient (n-octanol/water):
No information available

Viscosity:
No information available

Miscibility:
No information available

Solubility:
Soluble in Water
Slightly soluble in Ethanol
Slightly soluble in Acetone
Insoluble in Ether
Practically insoluble in Ethyl Acetate

10. STABILITY AND REACTIVITY

Reactivity

Reacts with reducing agents
Contact with combustible materials (wood, paper, oil, clothing, etc.) may cause fire
It may be a fire risk in contact with organic materials
Ammonium perchlorate decomposes at 130 deg. C and explodes at 380 deg. C
Ammonium perchlorate mixed with carbon (sugar charcoal) undergoes exothermic decomposition below 240 deg. C. Above 240 deg. C, the reaction produces mild explosions
Ammonium perchlorate decomposes violently with shock
Mixtures of ammonium perchlorate, with sulfur, powdered metals, or carbonaceous materials are impact-sensitive

Chemical stability

Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Ignition sources. Avoid dust formation. Contact with combustible materials (wood, paper, oil, clothing, etc.). Incompatible materials.

Incompatible Materials:
Combustible materials
Organic materials
Sulfur
Carbon
Reducing agents
Powdered metals
Strong acids

Hazardous decomposition products: Nitrogen oxides (NOx). Hydrogen chloride gas. Ammonia.

Other Information

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Ingestion. Inhalation.

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document
Component Information

Ammonium Perchlorate	
CAS-No.	7790-98-9

LD50/oral/rat = 4200 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = > 3500 mg/kg Dermal LD50
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No infomation available
Other LD50 or LC50information = No information available

Product Information

LD50/oral/rat =
VALUE- Acute Tox Oral = 4200 mg/kg

LD50/oral/mouse =
Value - Acute Tox Oral = No information available

LD50/dermal/rabbit
VALUE-Acute Tox Dermal = No information available

LD50/dermal/rat
VALUE -Acute Tox Dermal = >3500 mg/kg

LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
VALUE-Vapor = No information available
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

Symptoms

Skin Contact: May cause skin irritation.

Eye Contact: Causes eye irritation. Mild eye irritation. Eye contact may result in redness or pain.

Inhalation May cause irritation of respiratory tract. Symptoms may include coughing and wheezing, and shortness of breath. May cause nausea, vomiting. It may affect the liver.

Ingestion May cause digestive (gastointestinal) tract irritation. Ingestion may cause nausea, vomiting, diarrhea. May affect behavior/central nervous system (ataxia). May affect behavior/central nervous system (convulsions). May cause hyperthyroidism, or hypothyroidism.

Aspiration hazard No information available.

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

Chronic Toxicity Prolonged or repeated ingestion may affect the kidneys.

Sensitization: No information available.

Mutagenic Effects: No information available

Carcinogenic effects: Not considered carcinogenic.

Components	CAS-No.	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
Ammonium Perchlorate	7790-98-9	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity No data is available

Reproductive Effects: No information available
Developmental Effects: No information available
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available.
STOT - repeated exposure No information available.
Target Organs: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available.

Mobility: No information available.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

Components	CAS-No.	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Ammonium Perchlorate	7790-98-9	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No:	UN1442
Proper Shipping Name:	Ammonium perchlorate
Hazard Class:	5.1
Subsidiary Class	No information available
Packing group:	II
Emergency Response Guide Number	143
Marine Pollutant	No data available
DOT RQ (lbs):	No information available
Special Provisions	107, A9, IB6, IP2, T3, TP33
Symbol(s):	No information available
Description:	UN1442, Ammonium perchlorate, 5.1, II

TDG (Canada)

UN-No:	UN1442
Proper Shipping Name:	Ammonium perchlorate
Hazard Class:	5.1
Subsidiary Risk:	No information available
Packing Group:	II
Marine Pollutant	No Information available
Description:	UN1442, Ammonium perchlorate, 5.1, II

ADR

UN-No:	UN1442
Proper Shipping Name:	Ammonium perchlorate
Hazard Class:	5.1
Packing Group:	II
Subsidiary Risk:	No information available
Special Provisions	152
Description:	UN1442, Ammonium perchlorate, 5.1, II

IMO / IMDG

UN-No:	UN1442
Proper Shipping Name:	Ammonium perchlorate
Hazard Class:	5.1
Subsidiary Risk:	No information available
Packing Group:	II
Marine Pollutant	No information available
EMS:	F-H
Special Provisions	152
Description	UN1442, Ammonium perchlorate, 5.1, II

RID

UN-No: UN1442
Proper Shipping Name: Ammonium perchlorate
Hazard Class: 5.1
Subsidiary Risk: No information available
Packing Group: II
Special Provisions 152
Description: UN1442, Ammonium perchlorate, 5.1, II

ICAO

UN-No: UN1442
Proper Shipping Name: Ammonium perchlorate
Hazard Class: 5.1
Subsidiary Risk: No information available
Packing Group: II
Description: UN1442, Ammonium perchlorate, 5.1, II
Special Provisions A22

IATA

UN-No: UN1442
Proper Shipping Name: Ammonium perchlorate
Hazard Class: 5.1
Subsidiary Risk: No information available
Packing Group: II
ERG Code: 5L
Special Provisions No information available
Description: UN1442, Ammonium perchlorate, 5.1, II

15. REGULATORY INFORMATION

International Inventories

Components	CAS-No.	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Ammonium Perchlorate	7790-98-9	Present	Present KE-01725	Present	Present (1)-220	Present	Present	Present 232-235-1

U.S. Regulations

Ammonium Perchlorate

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 0109
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Present

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	CAS-No.	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Ammonium Perchlorate	7790-98-9	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CAS-No.	CERCLA -	Section 302	Section 302	Section 313 -	Section 313 -

		Hazardous Substances and their Reportable Quantities	Extremely Hazardous Substances and TPQs	Extremely Hazardous Substances and RQs	Chemical Category	Reporting de minimis
Ammonium Perchlorate	7790-98-9	None	None	None	None	None

U.S. TSCA

Components	CAS-No.	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Ammonium Perchlorate	7790-98-9	Not Applicable	Not Applicable

Canada

WHIMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information: The WHMIS 2015 classification of this product has not been validated or reviewed yet.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

WHMIS 1988 Hazard Class
The classification of this product has not been validated yet

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

Components	CAS-No.	Canada (DSL)	Canada (NDSL)
Ammonium Perchlorate	7790-98-9	Present	Not Listed

Components	CAS-No.	CEPA Schedule I - Toxic Substances
Ammonium Perchlorate	7790-98-9	Not listed
Components	CAS-No.	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Ammonium Perchlorate	7790-98-9	Not listed

EU Classification

EU GHS - SV - CLP 172/2008

Components	CAS-No.	EU GHS - SV - CLP (172/2008)
Ammonium Perchlorate	7790-98-9	Explosives - Expl. 1.1: H201 Explosive; mass explosion hazard.; Oxidizing solids - Ox. Sol. 1: H271 May cause fire or explosion, strong oxidizer.017-009-00-0

EU - CLP (1272/2008)

R-phrase(s)
R 2 - Risk of explosion by shock, friction, fire or other sources of ignition.
R 3 - Extreme risk of explosion by shock, friction, fire or other sources of ignition.
R 9 - Explosive when mixed with combustible material.

S -phrase(s)
S 2 - Keep out of the reach of children.
S14 - Keep away from easily oxidizable materials.
S16 - Keep away from sources of ignition - No smoking.
S36/37 - Wear suitable protective clothing and gloves.

Components	CAS-No.	**Classification**	**Concentration Limits:**	**Safety Phrases**
Ammonium Perchlorate	7790-98-9	E;R2 or R3; R9	No information	S: (2)-14-16-36/37

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
E - Explosive.
O - Oxidising.

16. OTHER INFORMATION

Preparation Date: 5/1/2017
Revision Date: Not Applicable
Prepared by: Sonia Owen

Disclaimer: All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet