Not appropriate for regulatory submission. Please visit www.spectrumchemical.com or contact Tech Services for the most up-to-date information contained in this information package.
Dear Customer,

Thank you for your interest in Spectrum’s quality products and services.

Spectrum has been proudly serving our scientific community for over 45 years. It is our mission to manufacture and distribute fine chemicals and laboratory products with Quality and delivery you can count on every time.

To accomplish our mission, Spectrum utilizes our sourcing leverage and supplier qualification expertise in offering one of the industry’s most comprehensive line of fine chemical products under one brand, in packaging configurations designed to meet your research and production requirements. Our product grades include: USP, NF, BP, EP, JP, FCC, ACS, KSA, Reagent grade, as well as DEA controlled substances. We operate facilities in the United States on the East Coast, West Coast, as well as in Shanghai, China in order to provide the best logistical support for our customers.

At Spectrum, Quality is priority number one. Suppliers with the best qualifications are preferred and we employ full-functioning in-house analytical laboratories at each of our facilities. Our facilities and systems are USFDA registered and ISO certified. We frequently host customer audits and cherish opportunities for improvements. Quality is engrained into our culture. Quality is priority number one.

In the following pages, we have designed and prepared documented scientific information to aid you in your initial qualification or your continual use of our products. Please do not hesitate to contact us if further information or the most up-to-date documentation is desired from any of the covered areas.

We appreciate your business and we look forward to hearing from you.

Sincerely,

Alan Wang, MSQA, ASQ CQA
Senior Manager of Technical Services
techservices@spectrumchemical.com

12-May-2016
M1354, Magnesium Sulfate, Anhydrous, USP

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● Product Allergen Statement

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● Product Certificate of Analysis Sample(s)

● General Lot Numbering System Guidance

● Stability – Shelf Life Guidance
<table>
<thead>
<tr>
<th>Item Number</th>
<th>M1354</th>
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<tbody>
<tr>
<td>Item</td>
<td>Magnesium Sulfate, Anhydrous, USP</td>
</tr>
<tr>
<td>CAS Number</td>
<td>7487-88-9</td>
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<tr>
<td>Molecular Formula</td>
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<tr>
<td>Molecular Weight</td>
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<td>ASSAY (ANHYDROUS BASIS)</td>
<td>99.0 - 100.5 %</td>
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<tr>
<td>pH (IN SOLUTION 1 IN 20)</td>
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<td>LOSS ON DRYING</td>
<td>2 %</td>
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<tr>
<td>CHLORIDE (Cl)</td>
<td>0.014 %</td>
</tr>
<tr>
<td>IRON</td>
<td>20 ug/g</td>
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<tr>
<td>HEAVY METALS</td>
<td>0.001 %</td>
</tr>
<tr>
<td>SELENIUM (Se)</td>
<td>0.003 %</td>
</tr>
<tr>
<td>EXPIRATION DATE</td>
<td>TO PASS TEST</td>
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</table>

Spectrum Chemical Mfg Corp

**Corporate Headquarters:**
769 Jersey Ave.
New Brunswick, NJ 08901
732.214.1300

**West Coast Facility:**
14422 S. San Pedro St.
Gardena, CA 90248
310.516.8000
SAFETY DATA SHEET

1. IDENTIFICATION

Product identifier
Product code: M1354
Product Name: MAGNESIUM SULFATE, ANHYDROUS, USP

Other means of identification
Synonyms: Magnesium sulphate
Sulfuric acid, magnesium salt (1:1)
Sulfuric acid, magnesium salt
Epsom salt
Epsom salts
CAS #: 7487-88-9
RTECS #: OM4500000
CI#: Not available

Recommended use of the chemical and restrictions on use
Recommended use: fertilizers, matches, mineral water, catalyst carriers, cosmetics, dietary supplements, plastics, detergents, fireproofing fabrics, paper sizing, tanning leather, dyeing textiles, laboratory chemical. It is also used in human medicine as an anticonvulsant and antiarrhythmic. In veterinary medicine, it is used as a poultice for infected wounds.
Uses advised against: No information available

Supplier: Spectrum Chemicals and Laboratory Products, Inc.
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: Regina Wachenheim (East Coast)

2. HAZARDS IDENTIFICATION

Classification
This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Label elements
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
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<tbody>
<tr>
<td>Magnesium Sulfate, Anhydrous</td>
<td>7487-88-9</td>
<td>100</td>
<td>*</td>
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</table>

4. FIRST AID MEASURES

First aid measures
General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

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

Eye Contact: Flush eye with water for 15 minutes. Get medical attention if irritation occurs. If symptoms persist, call a physician.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. In case of shortness of breath, give oxygen. Obtain 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: May cause eye/skin irritation.

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: The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media: No information available.
Specific hazards arising from the chemical

Hazardous Combustion Products: No information available.
Specific hazards: No information available.

Special Protective Actions for Firefighters

Specific Methods: No information available.
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: Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment.
Environmental precautions: No information available.

Methods and material for containment and cleaning up

Methods for containment: Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading.
Methods for cleaning up: Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions: Provide sufficient air exchange and/or exhaust in work rooms. Keep away from incompatible materials.
Safe Handling Advice: Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe vapours/dust. Keep away from heat and sources of ignition. 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 in a dry and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials.

Incompatible Materials: Oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

U.S Occupational Exposure Limits: Not determined
United States

<table>
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<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
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Canada

Canada Occupational Exposure Limits: Not determined

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<tr>
<th>Components</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario</th>
<th>Quebec</th>
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Australia and Mexico

Occupational Exposure Limits for Australia and Mexico: Not determined

<table>
<thead>
<tr>
<th>Components</th>
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<tr>
<td>Magnesium Sulfate, Anhydrous - 7487-88-9</td>
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</table>

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:** Safety glasses. Safety glasses with side-shields.
- **Skin and body protection:** Long sleeved clothing. Chemical resistant apron. Gloves.
- **Respiratory protection:** Wear respirator with dust filter..
- **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
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<table>
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<tr>
<th>Property</th>
<th>Value</th>
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<td>Physical state</td>
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<td>Odor</td>
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<tr>
<td>Molecular/Formula weight</td>
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<tr>
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<tr>
<td>Miscibility</td>
<td>No information available</td>
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</table>

## 10. STABILITY AND REACTIVITY

### Reactivity
- It reacts with Calcium Hydroxide to form Magnesium Hydroxide.
- It reacts with arsenates, phosphates, tartrates, precipitating corresponding magnesium salts.
- Lead, barium, strontium and calcium react with Magnesium Sulfate resulting in precipitation of respective sulfates

### Chemical stability
- **Stability:** Stable at normal conditions
- **Possibility of Hazardous Reactions:** Hazardous polymerization does not occur
- **Conditions to avoid:** Heat. Incompatible materials.
- **Incompatible Materials:** Oxidizing agents.
- **Hazardous decomposition products:** Sulphur oxides.

### Other Information

**Product code:** M1354  
**Product name:** MAGNESIUM SULFATE, ANHYDROUS, USP
11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Ingestion. Inhalation.

Acute Toxicity

Component Information

*Magnesium Sulfate, Anhydrous - 7487-88-9*

- **LD50/oral/rat** = No information available
- **LD50/oral/mouse** = No information available
- **LD50/dermal/rabbit** = No information available
- **LD50/dermal/rat** = No information available
- **LC50/inhalation/rat** = No information available
- **LC50/inhalation/mouse** = No information available
- Other **LD50 or LC50 information** = No information available

Product Information

- **LD50/oral/rat** = No information available
  - VALUE- Acute Tox Oral = No information available
- **LD50/oral/mouse** = No information available
  - Value - Acute Tox Oral = No information available
- **LD50/dermal/rabbit** = No information available
  - VALUE-Acute Tox Dermal = No information available
- **LD50/dermal/rat** = No information available
  - VALUE - Acute Tox Dermal = No information available
- **LC50/inhalation/rat** = No information available
  - VALUE-Vapor = No information available
  - VALUE-Gas = No information available
  - VALUE-Dust/Mist = No information available
- **LC50/Inhalation/mouse** = No information available
  - 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:** May cause eye irritation.
- **Inhalation** May cause irritation of respiratory tract.

Product code: M1354

Product name: MAGNESIUM SULFATE, ANHYDROUS, USP
**Ingestion**

It can be ingested in large amounts and is not absorbed from the gastrointestinal tract unless there is blockage or injury. It has a purging or laxative effect. It may cause gastrointestinal tract irritation with nausea, vomiting, hypermotility, diarrhea. When absorbed from the gastrointestinal tract in the case of blockage or injury, it may cause flushing, sweating, and affect behavior/central nervous system (muscle weakness, central nervous system depression, somnolence, convulsions), peripheral nervous system (flaccid paralysis), cardiovascular system (cardiac arrhythmias, hypotension), blood (changes in serum composition), respiration (respiratory depression, apnea), liver, brain (degenerative changes). It may also cause hypoglycemia, hypermagnesemia.

**Aspiration hazard**

No information available

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

**Chronic Toxicity**

No information available

**Sensitization:**

No information available

**Mutagenic Effects:**

No information available

**Carcinogenic effects:**

Not considered carcinogenic

<table>
<thead>
<tr>
<th>Components</th>
<th>ACGIH - Carcinogens</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA HCS - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
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<td>Not listed</td>
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</tbody>
</table>

**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.

**Magnesium Sulfate, Anhydrous - 7487-88-9**

**Freshwater Algae Data:**

2700 mg/L EC50 Desmodesmus subspicatus 72 h

**Freshwater Fish Species Data:**

2610 - 3080 mg/L LC50 Pimephales promelas 96 h static 1

**Water Flea Data:**

266.4 - 417.3 mg/L EC50 Daphnia magna 48 h

**Persistence and degradability:**

No information available

**Bioaccumulative potential:**

No information available

---

**Product code:** M1354  
**Product name:** MAGNESIUM SULFATE, ANHYDROUS, USP
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

<table>
<thead>
<tr>
<th></th>
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<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT

UN-No: Not regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: Not applicable
Packing Group: None
Marine Pollutant: No data available
ERG No: No information available
DOT RQ (lbs): No information available

TDG (Canada)

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available

ADR

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available
IMDG Page: No information available

Product code: M1354
Product name: MAGNESIUM SULFATE, ANHYDROUS, USP
14. TRANSPORT INFORMATION

Marine Pollutant: No information available
MFAG: No information available
Maximum Quantity: No information available

RID
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Classification Code: No information available
Description: No information available

ICAO
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available

IATA
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available

15. REGULATORY INFORMATION

International Inventories

<table>
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<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>KOREA KECL</th>
<th>Philippines (PICCS)</th>
<th>Japan ENCS (1)-467</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
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<tbody>
<tr>
<td>Magnesium Sulfate, Anhydrous</td>
<td>Present</td>
<td>Present KE-22752</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>Present 231-298-2</td>
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</table>

U.S. Regulations

Magnesium Sulfate, Anhydrous
FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 184.1443


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)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
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<tbody>
<tr>
<td>Magnesium Sulfate, Anhydrous</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

CERCLA/SARA

Product code: M1354
Product name: MAGNESIUM SULFATE, ANHYDROUS, USP
Components | CERCLA - Hazardous Substances and their Reportable Quantities | Section 302 Extremely Hazardous Substances and TPQs | Section 302 Extremely Hazardous Substances and RQs | Section 313 - Chemical Category | Section 313 - Reporting de minimis
--- | --- | --- | --- | --- | ---
Magnesium Sulfate, Anhydrous | None | None | None | None | None

U.S. TSCA

| Components | TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS) | TSCA 8(d) - Health and Safety Reporting |
--- | --- | ---
Magnesium Sulfate, Anhydrous | Not Applicable | Not Applicable

Canada

WHMIS hazard class:
Non-controlled

Magnesium Sulfate, Anhydrous
Uncontrolled product according to WHMIS classification criteria

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 | Canada (DSL) | Canada (NDSL) |
--- | --- | ---
Magnesium Sulfate, Anhydrous | Present | Not Listed

EU Classification

R-phrase(s)
none

S -phrase(s)
none

| Components | Classification | Concentration Limits: | Safety Phrases |
--- | --- | --- | ---
Magnesium Sulfate, Anhydrous | No information | |

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

Indication of danger:
Not dangerous

Product code: M1354

Product name: MAGNESIUM SULFATE, ANHYDROUS, USP
16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
<th>Personal Protective Equipment</th>
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<td><img src="Image" alt="NFPA Icon" /></td>
<td><img src="Image" alt="HMIS Icon" /></td>
<td><img src="Image" alt="PPPE Icon" /></td>
</tr>
</tbody>
</table>

**Preparation Date:** 7/10/2014  
**Revision Date:** 7/10/2014  
**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.

See Section 8.

End of Safety Data Sheet
Manufacturer

Product Covered: M1354, Magnesium Sulfate, Anhydrous, USP

Spectrum takes ownership as the manufacturer for the Spectrum product listed above and provides full quality assurance, customer service, and technical product support.

While information concerning the raw material manufacturer of our starting materials is considered proprietary, such information can be made available upon request contingent on demonstration of business volume justification and successful execution of confidential disclosure agreement (CDA).

Requests for disclosure of proprietary raw material manufacturer information may be submitted to the assigned account representative for consideration.

Sincerely,

Alan Wang, MSQA, ASQ CQA
Senior Manager of Technical Services
techservices@spectrumchemical.com

Manufacturing Process Flowchart

Magnesium Sulfate, Anhydrous, USP - M1354

Magnesium sulfate

Purified water

Heat to dissolve

Filtration

Evaporation

Concentrate to thick slurry

Centrifuge the crystal and wash with purified water

Drying

Check for iron, assay, chloride

If Fail

If Pass

Finished product
Certificate of Registration

This is to certify that the quality management system of

**Spectrum Chemicals and Laboratory Products, Inc.**
Main Site: 14422 South San Pedro Street, Gardena, California, 90248, USA
Additional Sites: 13915 South Main Street, Los Angeles, California, 90061, USA
755 Jersey Avenue, New Brunswick, New Jersey, 08901, USA
769 Jersey Avenue, New Brunswick, New Jersey, 08901, USA
7400 North Oracle Road, Suite 221, Tucson, Arizona, 85704, USA

has been assessed and registered by Intertek as conforming to the requirements of

**ISO 9001:2008**

The quality management system is applicable to

**California and New Jersey sites**: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for the laboratory, pharmaceutical, food, healthcare, cosmetic, fragrance, biotechnology, environmental and process industries.

**Arizona site**: Supporting Spectrum’s two manufacturing facilitates by: selecting and qualifying distributors of Laboratory and Safety Equipment; processing bids and quotes to generate new sales opportunities; sourcing bulk chemicals in support of bulk bids and quotes; assisting production operations through order expediting and IT infrastructure support.

Certificate Number: 94-316m-01
Initial Certification Date: 27 December 1994
Certificate Issue Date: 29 January 2016
Certificate Expiry Date: 14 September 2018

Calin Moldovean, President
Intertek Testing Services NA, Inc.
900 Chelmsford Street, Suite 301-3, Lowell, MA, USA

In the issuance of this certificate, Intertek assumes no liability to any party other than to the Client, and then only in accordance with the agreed upon Certification Agreement. This certificate’s validity is subject to the organization maintaining their system in accordance with Intertek’s requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.

The certificate remains the property of Intertek, to whom it must be returned upon request.
Certificate of Registration

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.

In the issuance of this certificate, Intertek assumes no liability to any party other than to the client, and then only in accordance with the agreed upon Certification Agreement. This certificate’s validity is subject to the organization maintaining their system in accordance with Intertek’s requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.

The annual validity of the certificate can also be checked through the website http://www.cnca.gov.cn of CNCA in China.

The certificate remains the property of Intertek, to whom it must be returned upon request.

This is to certify that the quality management system of

Spectrum China Ltd.

Building A20, No. 3802, Shengang Road, Songjiang District, Shanghai, China

has been assessed and registered by Intertek as conforming to the requirements of

ISO 9001: 2008

The quality management system is applicable to:

Provision of service of purchase, testing and sales for chemical products, repacking of non-hazardous chemical products.

Organization Code: 77762704-8
Certificate Number: 111310001-01
Certificate Issue Date: 17 November 2015
Certificate Expiry Date: 14 September 2018

Authorised Signature: Calin Moldovean – President, Business Assurance
Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.

In the issuance of this certificate, Intertek assumes no liability to any party other than to the client, and then only in accordance with the agreed upon Certification Agreement. This certificate’s validity is subject to the organization maintaining their system in accordance with Intertek’s requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.

The annual validity of the certificate can also be checked through the website http://www.cnca.gov.cn of CNCA in China.

The certificate remains the property of Intertek, to whom it must be returned upon request.
March 28, 2016

Certificate of cGMP

Dear Valued Customer:

Spectrum Chemicals and Laboratory Products certify that our USP, NF, FCC, EP, BP, JP, and food grade products are produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

Spectrum is an FDA registered and inspected drug establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

Spectrum-Gardena, CA: 2020632
Spectrum-New Brunswick, NJ: 2246824
Spectrum -Shanghai, China: 3006174778

Thank you for your interest with Spectrum products. Please feel free to contact the Quality Assurance department at 310-516-8000 or via email at qualityassurance@spectrumchemical.com if we may be of further assistance.

Sincerely,

Michelle Weston
Quality Assurance Specialist
May 9, 2016

Certificate of cGMP

Dear Valued Customer:

Spectrum Chemicals and Laboratory Products certify that the following product(s) is produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1354</td>
<td>Magnesium Sulfate, Anhydrous, USP</td>
</tr>
</tbody>
</table>

Spectrum is an FDA registered and inspected drug establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

- Spectrum-Gardena, CA: 2020632
- Spectrum-New Brunswick, NJ: 2246824
- Spectrum-Shanghai, China: 3006174778

Thank you for your interest with Spectrum products. Please feel free to contact the Quality Assurance department at 310-516-8000 or via email at qualityassurance@spectrumchemical.com if we may be of further assistance.

Sincerely,

Michelle Weston
Quality Assurance Specialist
May 11, 2016

Re: Magnesium Sulfate, Anhydrous, USP-M1354

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfr. Corp. understand the concern regarding Bovine Spongiform Encephalopathy (BSE). Please be assured that the chemical Magnesium Sulfate, Anhydrous, USP-M1354 is BSE/TSE free.

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag-Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature
May 11, 2016

Re: Magnesium Sulfate, Anhydrous, USP-M1354

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfr. Corp. understand the concern regarding the presence of allergens in raw materials. Please be assured that the following chemical does not contain (Milk; Egg; Fish; Shellfish; Sulfur dioxide and sulfites at concentrations of more than 10 mg/kg or 10 mg/liter expressed as SO2; Lupin; Tree nuts; Mollusks; Wheat; Peanuts; Soy; Cereals containing Gluten; Celery; Mustard; Sesame Seed).

Magnesium Sulfate, Anhydrous, USP-M1354

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag-Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature
May 11, 2016

Re: Magnesium Sulfate, Anhydrous, USP-M1354

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfg. Corp. understand the concern regarding Aflatoxins in raw materials. To the best of our knowledge, the product listed below is not contaminated with Aflatoxins. Aflatoxins are not used in production. The following product does not come in contact with Aflatoxins at any stage of production.

Magnesium Sulfate, Anhydrous, USP-M1354

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag-Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature
The Spectrum label presents technical and safety information in an easily understood format. Our technical specialists stay abreast of the latest requirements of the Globally Harmonized System for Classification and Labelling of Chemicals (GHS), as well as the Occupational Safety and Health Administration (OSHA), the Food and Drug Administration (FDA) and other government regulatory agencies in order to ensure compliance, accuracy and concise hazard communication.

**Magnesium Sulfate**

- **CAS 7487-88-9**
- **U.S.P.**
- **Anhydrous**

**CAUTION:** For manufacturing, processing or repacking. Read and understand the label and Safety Data Sheet (SDS) prior to use.

**USE CARE:** This material has been evaluated per GHS/OSHA criteria and is not classified as hazardous. All chemicals may pose unknown hazards and must be used with caution. Use personal protection and safe handling methods consistent with proper workplace safety practices. Consult SDS for additional properties and precautions. If adverse reaction occurs seek medical attention.

**KEEP FROM CHILDREN**

**WARNING:** This product contains a chemical known to the State of California to cause cancer.

**WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

**MgSO₄**

**F.W. 120.37**

Not intended for use in preparing parenteral dosage forms.

- **Assay (Anhydrous Basis)**: 99.0-100.5%
- **pH in Solution (1 in 20)**: 5.0-9.2
- **Loss on Drying**: 2%
- **Chloride**: 0.014%
- **Iron**: 20 μg/g
- **Heavy Metals**: 0.001%
- **Selenium**: 0.003%
- **Residual Solvents**: To pass test

**Exp. Date:** 03-31-2025

**Bar Code**

**GHS Hazard Pictograms**

**Warning, Safety Data and Precautionary Information**

**Product Catalog Number**

**Item Name, Form, Grade**

**Empirical Formula, Formula Weight and Technical Specifications Panel**

**Expiration Information**

**Lot Number**

**Kosher Certified by Kosher Supervision of America (KSA).**

This color-coded band indicates the hazard most likely to be posed by that material under storage conditions. The criteria used to assign band colors have been established by the Storage Code working group of the Society for Chemical Hazard Communication (SCHC). It is recommended that like colors be stored together, unless otherwise stated, based on the color codes indicated to the right. However, it is the responsibility of the customer to check with their local fire department for possible conflicts with our recommendations when storing hazardous chemicals.

**Spectrum Chemical Mfg Corp**

**Corporate Headquarters:**
769 Jersey Ave.
New Brunswick, NJ 08901
732.214.1300

**West Coast Facility:**
14422 S. San Pedro St.
Gardena, CA 90248
310.516.8000
<table>
<thead>
<tr>
<th>Item Number</th>
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<tbody>
<tr>
<td>M1354</td>
<td>1FC0885</td>
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<table>
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<tr>
<th>Item</th>
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<th>Molecular Formula</th>
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<tbody>
<tr>
<td>Magnesium Sulfate, Anhydrous, USP</td>
<td>7487-88-9</td>
<td>MgSO₄</td>
</tr>
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<table>
<thead>
<tr>
<th>Test</th>
<th>Specification</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSAY (ANHYDROUS BASIS)</td>
<td>99.0 - 100.5 %</td>
<td>99.99 %</td>
</tr>
<tr>
<td>pH (IN SOLUTION 1 IN 20)</td>
<td>5.0 - 9.2</td>
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</tr>
<tr>
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<tr>
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<tr>
<td>IRON</td>
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<td>&lt;20 µg/g</td>
</tr>
<tr>
<td>HEAVY METALS</td>
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<td>&lt;0.001 %</td>
</tr>
<tr>
<td>SELENIUM (Se)</td>
<td>0.003 %</td>
<td>&lt;0.003 %</td>
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<td>EXPIRATION DATE</td>
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<td>01-FEB-2021</td>
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<td>RESIDUAL SOLVENTS</td>
<td>TO PASS TEST</td>
<td>NO RESIDUAL SOLVENTS USED</td>
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<tr>
<td>APPEARANCE</td>
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<td>MANUFACTURE DATE</td>
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All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.
# Certificate Of Analysis

<table>
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<tr>
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<th>M1354</th>
<th>Lot Number</th>
<th>2FA0388</th>
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</tr>
<tr>
<td>CAS Number</td>
<td>7487-88-9</td>
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<tr>
<td>Molecular Formula</td>
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<th>Result</th>
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<tr>
<td><strong>ASSAY (ANHYDROUS BASIS)</strong></td>
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<td><strong>pH (IN SOLUTION 1 IN 20)</strong></td>
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<tr>
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<tr>
<td><strong>CHLORIDE (Cl)</strong></td>
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<tr>
<td><strong>IRON</strong></td>
<td>20 ug/g</td>
<td>&lt;20 ug/g</td>
</tr>
<tr>
<td><strong>HEAVY METALS</strong></td>
<td>0.001 %</td>
<td>&lt;0.001 %</td>
</tr>
<tr>
<td><strong>SELENIUM (Se)</strong></td>
<td>0.003 %</td>
<td>&lt;0.003 %</td>
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<td><strong>EXPIRATION DATE</strong></td>
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<td>17-SEP-2020</td>
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<td><strong>RESIDUAL SOLVENTS</strong></td>
<td>TO PASS TEST</td>
<td>NO RESIDUAL SOLVENTS USED</td>
</tr>
<tr>
<td><strong>APPEARANCE</strong></td>
<td></td>
<td>WHITE POWDER</td>
</tr>
<tr>
<td><strong>DATE OF MANUFACTURE</strong></td>
<td></td>
<td>18-SEP-2015</td>
</tr>
</tbody>
</table>

Spectrum Chemical Mfg Corp  
755 Jersey Avenue  
New Brunswick 08901 NJ  

Certificate of Analysis Results Certified By:  

[Signature]

Mulbah F. Dwanah  
Laboratory Supervisor  
Spectrum Chemicals & Laboratory Products

All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.
January 26, 2016

RE: Lot Numbering System

Dear Valued Customer:

This letter is to inform you of Spectrum Chemicals and Laboratory Products’ Lot Numbering System. The system is based on an alpha-numerical sequence which provides the month, year and location of production.

The lot numbering system utilized until 2010 is a sequence of six characters, two letters followed by four numbers. The first letter represents the year, for example, Y denotes 2009 and Z denotes 2010. The second letter represents the month and site, for example, A-L denotes January through December at Spectrum’s Gardena, CA facility, while M-X denotes January through December at the New Brunswick, NJ facility. The following four numbers are sequentially assigned.

Example: ZI0928 = The 928th material produced in California in September 2010

The lot numbering system utilized for 2011 and forward, is a sequence of seven characters. The first character, a number, represents the production facility:

1 = Gardena, CA Facility
2 = New Brunswick, NJ Facility
3 = China Facility

The second character, a letter, represents the year. For example, A denotes 2011 and B denotes 2012. The third character, a letter, represents the month, with A denoting January and L denoting December. The following four numbers are sequentially assigned.

Example: 2AA0706 = The 706th material produced in New Jersey in January 2011

Thank you for your interest with Spectrum products. Please feel free to contact us at 310-516-8000 or via email at qualityassurance@spectrumchemical.com if we may be of further assistance.

Sincerely,

Michael Dang
Manager, GMP Compliance
Stability – Shelf Life Guidance

Product Covered: M1354, Magnesium Sulfate, Anhydrous, USP

Spectrum Chemical’s manufacturing partner has assigned the following shelf life guidance for the product listed above.

The product, M1354, Magnesium Sulfate, Anhydrous, USP, is assigned a 60 months shelf life from date of manufacturing. The quality and integrity of the chemical depends on the handling and storage conditions. Please refer to the Safety Data Sheet for proper storage and handling procedures.

Adan R. Hernandez
Quality Control Manager

Corporate Headquarters
769 Jersey Avenue
New Brunswick, NJ 08901-3605