Scientific Documentation

CA192, Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP

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.

Spectrum Chemical Mfg Corp
769 Jersey Avenue
New Brunswick, NJ 08901
Phone 732.214.1300

Ver4.01  29.April.2016
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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.

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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, Global Supplier Quality Assurance
qualityassurance@spectrumchemical.com

CA192, Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP

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### Specification for Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP (CA192)

<table>
<thead>
<tr>
<th>Item Number</th>
<th>CA192</th>
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<tbody>
<tr>
<td>Item</td>
<td>Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP</td>
</tr>
<tr>
<td>CAS Number</td>
<td>9004-32-4</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td></td>
</tr>
<tr>
<td>Molecular Weight</td>
<td></td>
</tr>
<tr>
<td>MDL Number</td>
<td></td>
</tr>
<tr>
<td>Synonyms</td>
<td>Base H ; Carmellose Sodium ; Cellulose, Carboxymethyl Ether Sodium Salt ; Sodium</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Test</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>SODIUM (DRIED BASIS)</td>
<td>6.5 - 9.5%</td>
</tr>
<tr>
<td>pH OF A 1% SOLUTION @ 25°C</td>
<td>6.5 - 8.5</td>
</tr>
<tr>
<td>LOSS ON DRYING</td>
<td>10.0%</td>
</tr>
<tr>
<td>HEAVY METALS</td>
<td>0.002%</td>
</tr>
<tr>
<td>VISCOSITY OF 2% AQUEOUS SOLN. @25 C</td>
<td>400 - 800 cps</td>
</tr>
<tr>
<td>IDENTIFICATION</td>
<td>TO PASS TEST</td>
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<td>RETEST DATE</td>
<td>TO PASS TEST</td>
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<tr>
<td>RESIDUAL SOLVENTS</td>
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### SAFETY DATA SHEET

**Preparation Date:** 1/22/2015

**Revision Date:** 1/22/2015

**Revision Number:** G1

#### Product identifier

**Product code:** CA192

**Product Name:** CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP

#### Other means of identification

**Synonyms:**
- Carmellose Sodium
- Cellulose, Carboxymethyl Ether, Sodium Salt
- Sodium Carboxymethylcellulose
- Carboxymethylcellulose, sodium salt
- Cellulose sodium glycolate
- Cellulose glycolic acid, sodium salt
- Sodium CMC;
- Sodium CM-cellulose;
- Sodium cellulose glycolate;
- Sodium glycolate cellulose;
- Sodium salt of carboxymethylcellulose
- Aquaplast; Carmethose; Cellofas; Cellpro; CMC sodium salt; Collowel; Ethoxose;
- Lovosa; NaCm-cellulose salt; Tylose C

**CAS #:** 9004-32-4

**RTECS #:** FJ5950000

**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 Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA  90248
(310) 516-8000

**Order Online At:** [https://www.spectrumchemical.com](https://www.spectrumchemical.com)

**Emergency telephone number**

Chemtrec 1-800-424-9300

**Contact Person:**
- Martin LaBenz (West Coast)
- Ibad Tirmiz (East Coast)

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**Product code:** CA192

**Product name:** CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
2. HAZARDS IDENTIFICATION

Classification

This chemical is 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)

| Combustible dust | - |

Label elements

Warning

May form combustible dust concentrations in air

Hazards not otherwise classified (HNOC)

Not Applicable

Other hazards

Not available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
<th>Trade Secret</th>
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<tbody>
<tr>
<td>Carboxymethylcellulose Sodium</td>
<td>9004-32-4</td>
<td>100</td>
<td>*</td>
</tr>
</tbody>
</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. 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: May cause eye/skin irritation. Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhoea.

Product code: CA192

Product name: CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
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: Carbon dioxide (CO2). Dry chemical. Water spray mist or foam.

Unsuitable Extinguishing Media: No information available.

Specific hazards arising from the chemical

Hazardous Combustion Products: Carbon monoxide; Carbon dioxide

Specific hazards: May be combustible at high temperatures. Avoid generating dust. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

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. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Remove all sources of ignition. Avoid dust formation. Avoid dispersal of dust in the air. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Nonsparking tools should be used.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

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. Use only non-sparking tools. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Product code: CA192
Product name: CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:
Provide sufficient air exchange and/or exhaust in work rooms. Minimize dust generation and accumulation. Avoid dust formation. Dry powders can build static electricity charges when subjected to friction of transfer and mixing operations. All equipment used when handling the product must be grounded. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Keep away from incompatible materials.

Safe Handling Advice:
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. 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:

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

U.S Occupational Exposure Limits: Not determined

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
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<tr>
<td>Carboxymethylcellulose Sodium - 9004-32-4</td>
<td>None</td>
<td>None</td>
<td>None</td>
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</table>

Canada

Canada Occupational Exposure Limits: Not determined

<table>
<thead>
<tr>
<th>Components</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario</th>
<th>Quebec</th>
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<tr>
<td>Carboxymethylcellulose Sodium - 9004-32-4</td>
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Australia and Mexico

Occupational Exposure Limits for Australia and Mexico: Not determined

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<tr>
<th>Components</th>
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<th>Mexico</th>
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</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose Sodium - 9004-32-4</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</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. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e. there is no leakage from the equipment) It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in the handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Goggles. 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
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical state:</th>
<th>Appearance:</th>
<th>Color:</th>
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<table>
<thead>
<tr>
<th>Odor:</th>
<th>Taste</th>
<th>Formula:</th>
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<tr>
<th>Molecular/Formula weight:</th>
<th>Flash point (°C):</th>
<th>Flashpoint (°C/°F):</th>
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<th>Flash Point Tested according to:</th>
<th>Lower Explosion Limit (%):</th>
<th>Upper Explosion Limit (%):</th>
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<th>Decomposition temperature(°C/°F):</th>
<th>Specific gravity:</th>
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<td>360-370 °C/680-698 °F</td>
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<th>pH:</th>
<th>Melting point/range(°C/°F):</th>
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<table>
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<tr>
<th>Density (g/cm³):</th>
<th>Bulk density:</th>
<th>Vapor pressure @ 20°C (kPa):</th>
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<td>1.59</td>
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<thead>
<tr>
<th>Evaporation rate:</th>
<th>Vapor density:</th>
<th>VOC content (g/L):</th>
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<td>No information available</td>
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</table>

<table>
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<tr>
<th>Odor threshold (ppm):</th>
<th>Partition coefficient (n-octanol/water):</th>
<th>Viscosity:</th>
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<tbody>
<tr>
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<tr>
<th>Miscibility:</th>
<th>Solubility:</th>
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<tbody>
<tr>
<td>No information available</td>
<td>Soluble in Water</td>
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</tbody>
</table>

10. STABILITY AND REACTIVITY

Reactivity
Reactive with oxidizing agents
Reactive with acids
Reacts with bases

Chemical stability
Stability: Stable at normal conditions
Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid:
Heat. Avoid dust formation. Dust may form explosive mixture in air. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Incompatible materials.

Incompatible Materials:

Hazardous decomposition products:
Carbon monoxide. Carbon dioxide.

Other Information
Corrosivity: No information available

Product code: CA192
Product name: CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
Special Remarks on Corrosivity: No information available

### 11. TOXICOLOGICAL INFORMATION

#### Information on likely routes of exposure

**Principal Routes of Exposure:**
Ingestion. Inhalation.

**Acute Toxicity**

#### Component Information

*Carboxymethylcellulose Sodium - 9004-32-4*

- **LD50/oral/rat** = 27000 mg/kg
- **LD50/oral/mouse** = >27000 mg/kg
- **LD50/dermal/rabbit** = >2000 mg/kg
- **LD50/dermal/rat** = No information available
- **LC50/inhalation/rat** = >5800 mg/m³ Inhalation LC50 Rat 4 h
- **LC50/inhalation/mouse** = No information available

Other LD50 or LC50 information = 16000 mg/kg Oral LD50 Guinea Pig
>27000 mg/kg Oral LD50 Rabbit

**Product Information**

- **LD50/oral/rat** =
  - VALUE Acute Tox Oral = 27000mg/kg

- **LD50/oral/mouse** =
  - Value - Acute Tox Oral = >27000

- **LD50/dermal/rabbit**
  - VALUE-Acute Tox Dermal = >2000mg/kg

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

- **LC50/inhalation/rat**
  - VALUE-Vapor = No information available
  - VALUE-Gas = No information available
  - VALUE-Dust/Mist = >5800mg/m³ (4-hr.)

- **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:** May cause eye irritation.

**Product code:** CA192

**Product name:**
CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
Inhalation
May cause irritation of respiratory tract.

Ingestion
Not expected to be a health hazard
Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea

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 liver, urinary system, and metabolism (sodium levels)
Repeated exposure may cause bronchitis to develop with cough, phlegm, and /or shortness of breath

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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<tbody>
<tr>
<td>Carboxymethylcellulose Sodium</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</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:
Aquatic environment.

Carboxymethylcellulose Sodium - 9004-32-4

Freshwater Fish Species Data: >20000 mg/l 96 h ONcorhynchus mykiss (Rainbow Trout) (Ecotox - U.S. EPA)

Water Flea Data: 87.26 mg/l 48 h EC50 Ceriodaphnia dubia (Ecotox - U.S. EPA)

Persistence and degradability:
No information available

Bioaccumulative potential:
No information available

Mobility:
No information available

Product code: CA192

Product name:
CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, 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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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose Sodium</td>
<td>None</td>
<td>None</td>
<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
ERG No: No information available
Marine Pollutant: No data 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

Product code: CA192

Product name:
CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
14. TRANSPORT INFORMATION

Packing Group: No information available
Description: No information available
IMDG Page: No information available
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 (PICCS)</th>
<th>Japan ENCS (8)-181 (8)-185 (8)-203</th>
<th>CHINA [33850]</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
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<td>Present XU</td>
<td>Present KE-05354</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
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</table>

U.S. Regulations

Carboxymethylcellulose Sodium
FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 182.1745


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)

Product code: CA192
Product name: CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
### Components

<table>
<thead>
<tr>
<th>Carboxymethylcellulose Sodium</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
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<tbody>
<tr>
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<td>Not Listed</td>
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</table>

### CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose Sodium</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

### U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose Sodium</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

### Canada

**WHMIS hazard class:**
Non-controlled

**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

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose Sodium</td>
<td>Present</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>CEPA Schedule I - Toxic Substances</th>
<th>CEPA - 2010 Greenhouse Gases Subject to Manditory Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose Sodium</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

### EU Classification

**R-phrase(s)**
not determined

**S -phrase(s)**
none

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
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</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose Sodium</td>
<td></td>
<td>No information</td>
<td></td>
</tr>
</tbody>
</table>

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

**Product code:** CA192

**Product name:**
CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
**Indication of danger:**
Not dangerous

### 16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
<th>Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Preparation Date:** 1/22/2015  
**Revision Date:** 1/22/2015  
**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.

**Product code:** CA192  
**Product name:** CARBOXYMETHYLCELLULOSE SODIUM, MEDIUM VISCOSITY, VISCOSITY OF 2 PERCENT AQUEOUS SOLUTION @ 25 DEG C: 400-800 CPS, USP
Manufacturer

Product Covered: CA192, Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, 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, Global Supplier Quality Assurance
qualityassurance@spectrumchemical.com
Certificate of Registration

Intertek

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.

CT-ISO 9001-2008-ANAB-EN-LT-L-26,jun.15
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

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
April 25, 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>CA192</td>
<td>Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, 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
April 28, 2016

Re: Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP-CA192

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

Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP-CA192

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
April 28, 2016

Re: Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP-CA192

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).

Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP-CA192

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
April 28, 2016

Re: Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP-CA192

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.

Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP-CA192

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.

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

**WARNING:**
- May form combustible (explosive) dust-air mixtures.
- Keep away from all ignition sources including heat, sparks and flame
- Keep container closed and grounded
- Prevent dust accumulations to minimize explosion hazard.

This material has been evaluated per GHS criteria and is not classified as hazardous under GHS. 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**

**Actual Viscosity of 2% Aqueous Solution @ 25°C:** 2 cP
**Sodium (Dried Basis):** 6.5-9.5%
**pH of a 1% Solution @ 25°C:** 6.5-8.5

**MAXIMUM LIMITS**
- Loss on Drying: 10.0%
- Heavy Metals: 0.002%
- Residual Solvents: To pass test

**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.

**Retest Date:** 03-31-2025

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
# Certificate Of Analysis

<table>
<thead>
<tr>
<th>Item Number</th>
<th>CA192</th>
<th>Lot Number</th>
<th>2FB0071</th>
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<tbody>
<tr>
<td>Item</td>
<td>Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP</td>
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</tr>
<tr>
<td>CAS Number</td>
<td>9004-32-4</td>
<td></td>
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<tr>
<td>Molecular Formula</td>
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<table>
<thead>
<tr>
<th>Test</th>
<th>Specification</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SODIUM (DRIED BASIS)</td>
<td>6.5 - 9.5%</td>
<td>8.3 %</td>
</tr>
<tr>
<td>pH OF A 1 % SOLUTION @ 25°C</td>
<td>6.5 - 8.5</td>
<td>7.3</td>
</tr>
<tr>
<td>LOSS ON DRYING</td>
<td>10.0%</td>
<td>5.0 %</td>
</tr>
<tr>
<td>HEAVY METALS</td>
<td>0.002%</td>
<td>&lt;0.002 %</td>
</tr>
<tr>
<td>VISCOSITY OF 2% AQUEOUS SOLN. @ 25 C</td>
<td>400 - 800 cps</td>
<td>505 cps</td>
</tr>
<tr>
<td>IDENTIFICATION</td>
<td>TO PASS TEST</td>
<td>PASSES TEST</td>
</tr>
<tr>
<td>RETEST DATE</td>
<td>26-SEP-2016</td>
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<tr>
<td>RESIDUAL SOLVENTS</td>
<td>TO PASS TEST</td>
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</tr>
<tr>
<td>CLASS 2 (SOLVENT) / METHANOL</td>
<td></td>
<td>&lt;3000 ppm</td>
</tr>
<tr>
<td>CLASS 3 (solvent) / 2-PROPAOL</td>
<td></td>
<td>&lt;5000 ppm</td>
</tr>
<tr>
<td>APPEARANCE</td>
<td>OFF WHITE CRYSTALLINE POWDER</td>
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<tr>
<td>DATE OF MANUFACTURE</td>
<td>27-SEP-2015</td>
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</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: CA192, Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP

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

The product, CA192, Carboxymethylcellulose Sodium, Medium Viscosity, Viscosity of 2 Percent Aqueous Solution @ 25 DEG C: 400-800 cP, USP, is assigned a 12 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