This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard 29 CFR 1910.1200 And Canadian Workplace Hazardous Materials Information System (WHMIS) requirements.

### 1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product name</th>
<th>Avicel® PH Microcrystalline Cellulose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>Microcrystalline cellulose (INCI Name): MCC, cellulose gel</td>
</tr>
<tr>
<td>Other names</td>
<td>Avicel® PH 101, 102, 103, 105, 112, 200, 113, 301, 302, 200LM</td>
</tr>
<tr>
<td>Chemical Family</td>
<td>Carbohydrate</td>
</tr>
<tr>
<td>Recommended use</td>
<td>Pharmaceutical excipient.</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>FMC Corporation</td>
</tr>
<tr>
<td></td>
<td>1735 Market Street</td>
</tr>
<tr>
<td></td>
<td>Philadelphia, PA 19103</td>
</tr>
<tr>
<td></td>
<td>(800) 526-3649</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:msdsinfo@fmc.com">msdsinfo@fmc.com</a></td>
</tr>
<tr>
<td>Emergency telephone number</td>
<td>1 302 / 451-0100 (FMC Plant - Newark, Delaware)</td>
</tr>
<tr>
<td></td>
<td>(303) 595-9048 (Medical - U.S. - Call Collect)</td>
</tr>
<tr>
<td></td>
<td>For leak, fire, spill or accident emergencies, call:</td>
</tr>
<tr>
<td></td>
<td>1 800 / 424 9300 (CHEMTREC - U.S.A.)</td>
</tr>
<tr>
<td></td>
<td>1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)</td>
</tr>
</tbody>
</table>

### 2. HAZARDS IDENTIFICATION

**Emergency Overview**

Powder becomes slippery when wet.

Dry or powdered ingredients are combustible. Dispersal of finely divided dust from products into air may form mixtures that are ignitable and explosive. Minimize airborne dust generation and eliminate sources of ignition.

<table>
<thead>
<tr>
<th>Appearance</th>
<th>white free flowing powder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Dry powder</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Eyes</td>
<td>Non-irritating.</td>
</tr>
<tr>
<td>Skin</td>
<td>Non-irritating to the skin.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Low inhalation toxicity.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>No known hazard by swallowing. Ingestion of large amounts may cause gastrointestinal discomfort including blockage, nausea, vomiting and diarrhea.</td>
</tr>
</tbody>
</table>

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td>9004-34-6</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

Eye contact
Rinse thoroughly with plenty of water, also under the eyelids. Keep eye wide open while rinsing.

Skin contact
Wash off with warm water and soap.

Inhalation
Remove person to fresh air. If signs/symptoms continue, get medical attention.

Ingestion
Drink plenty of water. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Indication of immediate medical attention and special treatment needed, if necessary
Treatment is symptomatic and supportive. This product has low oral, dermal and inhalation toxicity. It is non-irritating to the eyes and skin and non-sensitizing to the skin.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the chemical
Dry or powdered ingredients are combustible. Dispersal of finely divided dust from products into air may form mixtures that are ignitable and explosive. Minimize airborne dust generation and eliminate sources of ignition. According to NFPA 68, (Explosion Venting Guide), the Hazard Class of Dust Deflagrations for microcrystalline cellulose is St-1, the lowest hazard class.

Protective equipment and precautions for firefighters
In the event of fire and/or explosion do not breathe fumes. As in any fire, wear self-contained breathing apparatus and full protective gear.

NFPA

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Legend:
0 - Not hazardous
1 - Slightly
2 - Moderate
3 - High
4 - Severe

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Powder becomes slippery when wet. Avoid dust formation. Avoid breathing dust.

Methods for containment
Maintain good housekeeping practices to avoid accumulation of settled dust, especially on overhead surfaces

Methods for cleaning up
Sweep up and shovel into suitable containers for disposal.

Other
Refer to protective measures listed in sections 7 and 8.

7. HANDLING AND STORAGE

Handling
Avoid dust formation in confined areas. In case of insufficient ventilation, wear suitable respiratory equipment if release of airborne dust is expected.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 15 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>Mexico: TWA 10 mg/m³</td>
</tr>
<tr>
<td>9004-34-6</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>Mexico: STEL 20 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Chemical Name</td>
<td>British Columbia</td>
<td>Quebec</td>
<td>Ontario TWAEV</td>
<td>Alberta</td>
</tr>
<tr>
<td>Microcrystalline cellulose</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³ TWA: 5</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³ TWA: 5</td>
</tr>
<tr>
<td>9004-34-6</td>
<td>TWA: 3 mg/m³</td>
<td>mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Occupational exposure controls

Engineering measures
Use with local exhaust ventilation.

Personal Protective Equipment

General Information
If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied.

Respiratory protection
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. The use of breathing apparatus must comply strictly with the manufacturer's instructions and the regulations governing their choices and uses.

Eye/face protection
Safety glasses

Skin and body protection
No special precautions required

Hand protection
No special precautions required

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
white free flowing powder

Color
white to off white

Physical state
Dry powder

Odor
Odorless

Odor Threshold
No information available

pH
5.0 - 7.0 (11 % solids dispersion) (in solution)

Melting Point/Range
not determined

Freezing point
No information available

Boiling Point/Range
Not applicable

Flash Point
Not applicable

Autoignition Temperature
Not applicable

Vapor pressure
Not applicable

Vapor density
No information available

Density
No information available

Specific Gravity
No information available

Bulk density
0.2 - 0.5 g/cc

Water solubility
Insoluble in water

Percent volatile
1 - 5 % water, by weight

Partition coefficient
Not applicable

Viscosity
No information available

Explosive properties
St-1

Minimum Ignition Temperature: 420°C

Oxidizing properties
Not applicable

10. STABILITY AND REACTIVITY
Stability
Excessive heat, Humid air. Dust formation.
Conditions to avoid
None in particular.
Materials to avoid
Burning produces obnoxious and toxic fumes, Sulfur oxides.
Hazardous decomposition products
Hazardous polymerization does not occur.
Hazardous polymerization

11. TOXICOLOGICAL INFORMATION

Skin contact
Non-irritating (Rabbit).
Eye contact
Non-irritating (Rabbit).
Inhalation
May cause irritation of respiratory tract. No known hazard by inhalation.
Ingestion
No known hazard by swallowing. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td>&gt;5000 mg/kg (Rat)</td>
<td>&gt;2 g/kg (Rabbit)</td>
<td>&gt;5800 mg/m^3 (Rat) 4 h</td>
</tr>
</tbody>
</table>

Chronic Toxicity
No known effect.
Carcinogenicity
Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH).

Sensitization
Did not cause sensitization on laboratory animals guinea pig
Mutagenicity
In vitro tests did not show mutagenic effects. In vivo tests did not show mutagenic effects.
Target Organ Effects
None noted in chronic animal studies.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Not expected to have significant environmental effects.

Environmental Fate

Persistence and degradability
Microcrystalline cellulose is inherently biodegradable in soil.
Bioaccumulation
Bioaccumulation is unlikely.
Mobility
No information available.
Other adverse effects
None known

13. DISPOSAL CONSIDERATIONS

Waste disposal methods
This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated packaging
Dispose of in accordance with local regulations.
14. TRANSPORT INFORMATION

DOT
not regulated

TDG
not regulated

ICAO/IATA
not regulated

IMDG/IMO
not regulated

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>TSCA Inventory (United States of America)</th>
<th>DSL (Canada)</th>
<th>EINECS/E LINCS (Europe)</th>
<th>ENCS (Japan)</th>
<th>IECSC (China)</th>
<th>KECL (Korea)</th>
<th>PICCS (Philippines)</th>
<th>AICS (Australia)</th>
<th>NZIoC (New Zealand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose 9004-34-6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

U.S. FEDERAL REGULATIONS

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

SARA 311/312 Hazard Categories
- Acute Health Hazard: no
- Chronic Health Hazard: no
- Fire Hazard: no
- Sudden Release of Pressure Hazard: no
- Reactive Hazard: no

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

International Regulations
Mexico - Grade
No known effect based on information supplied.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Carcinogen Status</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td></td>
<td>Mexico: TWA 10 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: STEL 20 mg/m³</td>
</tr>
</tbody>
</table>

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
Non-controlled
16. OTHER INFORMATION

NFPA/HMIS Ratings Legend

Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

Revision Date: 2014-05-27
Reason for revision: No information available.

Disclaimer

FMC Corporation believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specified product designated and may not be applicable where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of FMC Corporation, FMC corporation expressly disclaims any and all liability as to any results obtained or arising from any use of the products or reliance on such information.

Product Suitability

The information contained in this document (as well as any advice or assistance) is provided by FMC only as a courtesy and is intended to be general in nature. Any uses suggested by FMC are presented only to assist our customers in exploring possible applications. FMC makes no warranty, express or implied, as to its accuracy or completeness, or the results to be obtained from such information, advice or assistance. Each customer is solely responsible for determining whether the FMC products are suitable for such customer’s intended use, and for obtaining any necessary governmental registrations and approvals for such customer’s production, marketing, sale, use and/or transportation of finished goods using or incorporating the FMC products.

Prepared By

Avicel and FMC Logo - Trademarks of FMC Corporation

© 2014 FMC Corporation. All Rights Reserved.

End of Material Safety Data Sheet