Product Safety Assessment

**METHOCEL® Cellulose Ethers**

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**Names**
- CAS No. 9004-65-3 (Hydroxypropyl methylcellulose)
- Hydroxypropyl methylcellulose
- Propylene glycol ether of methylcellulose
- METHOCEL® 310 Series Products
- METHOCEL A Series Products
- METHOCEL F Series Products
- METHOCEL K Series Products
- METHOCEL Premium Series Products
- METHOCEL E Series Products
- METHOCEL J Series Products
- METHOCEL® 40 Series Products
- Modified cellulose
- Methylcellulose
- METHOCEL Premium Series Products
- METHOCEL M Series Products

**Product Overview**
- METHOCEL® cellulose ethers belong to an extensive family of white to off-white, water-soluble methylcellulose and hydroxypropyl methylcellulose polymers that bind, retain water, thicken, form films, lubricate, and much more. Most METHOCEL cellulose ethers are supplied as free-flowing powders. A few are available as granules.¹,² See **Product Description**.
- METHOCEL cellulose ethers provide unique processing characteristics and physical properties to adhesives, agricultural chemicals, ceramics, construction products, cosmetics, foods, gelled fuels, household cleaning products, paints, paper coatings and treatments, personal-care products, pharmaceuticals, printing chemicals, textile treatments, and other products.³ See **Product Uses**.
- Although consumers use products that contain METHOCEL cellulose ethers, workers in cellulose ether production facilities or in facilities that formulate products with cellulose ethers are most likely to have direct exposure to these materials. See **Exposure Potential**.
- Dust from METHOCEL cellulose ethers could cause temporary mechanical irritation to the skin or eyes under extreme conditions and may be considered a nuisance dust if inhaled. However, the products are considered to present no significant health hazard.⁴ See **Health Information**.
- Despite a very slow rate of biodegradation, METHOCEL® cellulose ethers should not present any hazard in the soil and are not expected to be toxic to aquatic life.⁵ See **Environmental Information**.
- METHOCEL cellulose ethers are stable under recommended storage conditions. However, fine dusts of this material are capable of forming explosive mixtures with air.⁶ See **Physical Hazard Information**.

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Manufacture of Product

- **Capacity** — Dow has production facilities for METHOCEL* cellulose ethers in the U.S. and Germany. U.S. locations include: Midland, Michigan and Plaquemine, Louisiana. Locations in Germany include: Stade, Bomlitz, and Bitterfield.

- **Process** — METHOCEL cellulose ethers are available in two basic types: methylcellulose and hydroxypropyl methylcellulose. To produce methylcellulose products, cellulose fibers, mostly from wood pulp, are heated in a caustic solution and then treated with methyl chloride, yielding the methyl ether of cellulose. The fibrous reaction product is filtered, dried, and ground into a fine, uniform powder. The production of hydroxypropyl methylcellulose products is similar, except propylene oxide is used in addition to methyl chloride to obtain hydroxypropyl substitution on some of the anhydroglucose units.

![METHOCEL* Cellulose Ethers Process Flow Diagram](image)

Product Description

METHOCEL cellulose ethers are a broad range of water-soluble, white to off-white products. They are available in three different physical forms: powder, surface-treated powder, and granular. There are two different chemical types (methylcellulose and hydroxypropyl methylcellulose) and each is available in different grades, physical forms, and viscosities.

Both types of METHOCEL cellulose ethers are similar to dietary fiber in that they have a cellulosic polymer backbone. Cellulose is a natural carbohydrate and has multiple “sugar” or glucose molecules connected together (see the figure below). The ratio of hydroxypropyl to methoxyl material largely determines the properties of the different product grades.
Product Uses

METHOCEL cellulose ethers play an important role in the formulation and processing of adhesives, agricultural chemicals, ceramics, construction products, foods, gelled fuels, household cleaning products, paints, paper coatings and treatments, personal-care products, pharmaceuticals, printing chemicals, textile treatments, and other products. Applications in many of these product areas are listed below.

- **Adhesives** – Carpet backsizing compounds, leather processing adhesives, plywood laminating adhesives, cigar and cigarette adhesives, wallpaper pastes, latex adhesives
- **Agricultural chemicals** – Dispersing agents, spray adherents
- **Ceramics processing** – Tape casting, extrusion forming, dry and isostatic pressing, glazes/porcelain enamel, injection molding
- **Chemical specialties** – Resins, rubbers, suspension aids
- **Construction products** – Drywall tape-joint compounds, cement-based tile mortars, masonry mortars, gypsum adhesives, gypsum and cement hand and spray plasters, wall and ceiling textures, cement plasters, stucco
- **Foods** – Bakery products, confections, pie and pastry fillings, frozen desserts, whipped toppings, structured vegetable products, structured and extruded foods, frying batters, salad dressings, sauces
- **Gelled fuels** – Fuel thickeners
Exposure Potential

METHOCEL* cellulose ethers are used in the formulation of many consumer products. Based on the uses for these products, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a cellulose ethers manufacturing facility or in the various industrial or manufacturing facilities that use cellulose ethers. Those working with cellulose ethers in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing facility should provide general and/or local exhaust ventilation to control airborne levels of cellulose ether dusts below exposure guidelines. See Health Information.

- **Consumer exposure to products containing cellulose ethers** – METHOCEL cellulose ethers are formulated as components of many consumer products. See Health Information.

- **Environmental releases** – Water solutions of cellulose ethers are slippery. To prevent falls and injury, spills of dry powder should be thoroughly vacuumed or swept up. Use care to minimize generation of airborne dust. Any slight residual product on the walls or floor can then be flushed with water into a sewer. If the spill is a viscous solution, it should be diluted with cold water before disposal. See Environmental, Health and Physical Hazard Information.

- **Large release** – Industrial spills or releases of cellulose ethers are infrequent and are generally contained. If a large release occurs, do not permit dust to accumulate. When suspended in air, dusts can pose an explosion hazard. Eliminate all sources of ignition immediately. In case of fire, deny any unnecessary entry into the area. Fires can be extinguished by conventional means, avoiding any raising of dust by strong water jets. The use of water spray, carbon dioxide, or powder extinguishers is recommended when fighting a fire involving cellulose ethers. Follow emergency procedures carefully. See Environmental, Health and Physical Hazard Information.

For more information, review the relevant Safety Data Sheet (SDS).

Health Information

Many of the chemical, physical, and functional properties of METHOCEL cellulose ethers resemble those of naturally occurring plant and seaweed gums. METHOCEL cellulose ethers have undergone extensive evaluation and testing in both acute and long-term feeding studies in a number of species, including humans. If swallowed, their oral toxicity is very low. Although the dust may cause slight skin and eye irritation under extreme conditions, including the possibility of corneal injury, the products are considered to present no significant health hazard in handling.

For more information, review the relevant SDS.
Environmental Information\textsuperscript{22,23}

METHOCEL\textsuperscript{*} cellulose ethers are not expected to bioconcentrate because of their high molecular weight. Although biodegradation is expected to be very slow, cellulose ethers should not present any hazard in soil and should not be toxic to aquatic life.

For more information, review the relevant Safety Data Sheet (SDS).

Physical Hazard Information\textsuperscript{24,25,26}

METHOCEL cellulose ethers are stable under recommended storage conditions. However, these materials will burn under the right conditions of heat and oxygen supply. Fine dusts are capable of forming explosive mixtures with air. Dusts should not be exposed to temperatures above 275°F (135°C) as they may decompose and lead to a possible dust explosion. Cellulose ethers should not be stored near peroxides or other oxidizing agents. Avoid contact with strong acids or bases.

For more information, review the relevant SDS.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of METHOCEL products. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant SDS, Technical Handbook or Contact Us.

Additional Information

- Safety Data Sheets (http://www.dow.com/webapps/msds/msdssearch.asp)
  - METHOCEL J7SM SN Hydroxypropyl Methylcellulose Material Safety Data Sheet, The Dow Chemical Company, July 5, 2006
- Contact Us (http://www.dow.com/methocel/contact.htm)
- METHOCEL Cellulose Ethers: Multifunctional Water-Soluble Polymers for Personal Care Applications, Amerchol Corporation (a subsidiary of The Dow Chemical Company), Form No. 324-00180-0805 AMS, August 2005 (http://www.dow.com/PublishedLiterature/dh_0050/0901b80380050865.pdf?filepath=amerchol/pdfs/noreg/324-00180.pdf&fromPage=GetDoc)

For more business information about METHOCEL products, visit Dow's METHOCEL cellulose ethers web site. (http://www.dow.com/methocel)

References

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\textsuperscript{1} Dow METHOCEL\textsuperscript{*} cellulose ethers website. (http://www.dow.com/methocel/).
\textsuperscript{2} METHOCEL Cellulose Ethers: Multifunctional Water-Soluble Polymers for Personal Care Applications, Amerchol Corporation (a subsidiary of The Dow Chemical Company), Form No. 324-00180-0805 AMS, August 2005, page 4.
Dow METHOCEL cellulose ethers website. (http://www.dow.com/methocel/).


METHOCEL Cellulose Ethers: Multifunctional Water-Soluble Polymers for Personal Care Applications, Amerchol Corporation (a subsidiary of The Dow Chemical Company), Form No. 324-00180-0805 AMS, August 2005, page 4.


METHOCEL Cellulose Ethers: Multifunctional Water-Soluble Polymers for Personal Care Applications, Amerchol Corporation (a subsidiary of The Dow Chemical Company), Form No. 324-00180-0805 AMS, August 2005, page 25.


NOTICES:

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