



# WALOCEL C™ CMC

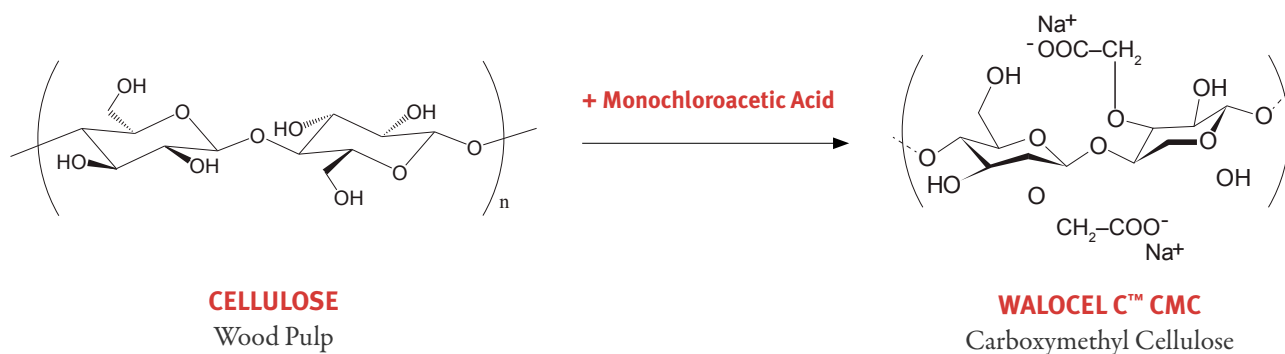
Carboxymethyl Cellulose for Industrial Applications





## WHAT IS WALOCEL C™ CMC?

WALOCEL C™ Carboxymethyl Cellulose (CMC) Water-Soluble Polymers are cellulose ethers that are derived from natural wood or other cellulosic materials. To obtain WALOCEL C™ CMC, wood pulp is treated with sodium hydroxide to form alkali cellulose. The alkali cellulose is then treated with monochloroacetic acid to obtain carboxymethyl cellulose.



## DUPONT IS THE WORLD LEADER IN CELLULOSIC DERIVATIVES

WALOCEL C™ CMC offers an exceptional range of properties that can be fine-tuned to create customizable solutions. A key component of many consumer products, industrial products and intermediates, WALOCEL C™ CMC is backed by a world-class Research & Development team, regional Technical Application teams and regional laboratories. It is widely used in food, pharmaceutical, energy storage, pulp and paper, agriculture and many other industries.





## WALOCEL C™ CMC OFFERS A UNIQUE RANGE OF FUNCTIONAL PROPERTIES

WALOCEL C™ CMC is our most widely used polymer for industrial applications. It provides a vast number of functional properties and is cost-effective.

- Water solubility
- Thickening: clear viscous solutions, range of viscosities (30 to 60,000 mPas in 2% solution)
- Rheology modification
- Pseudoplastic / shear thinning or Newtonian
- Anionic
- Low surface tension: less foam formation compared to other cellulose ethers
- Lubricant
- Excellent water-binding properties (150 g water / 1 g)
- Stable in a wide pH-range (pH 3.5 – 12)
- Stable with monovalent, unstable with bi- or trivalent cations
- Compatible with most other formulation components
- No odor, no taste
- Inhibits crystallization
- Film-forming
- Compatible with minor amounts of selected solvents in the presence of water
- Approved food additive, suitable for food contact

## A RANGE OF FUNCTIONAL PROPERTIES

Enables the customization of required viscosity and rheology modification properties.

**Rheology Modification**

**Water Solubility**

Exhibits excellent solubility in water; compatible with minor amounts of selected solvents in the presence of water.

Approved food additive; used in specialty packaging for food contact and other consumer applications; not absorbed in the gastrointestinal tract due to high molecular weight.

**Low Toxicity – Food Contact**

**Viscosity**

Forms transparent, odorless and tasteless solutions; a wide range of viscosities can be reached, from 30 to 60,000 mPas in a 2% solution; an excellent economic option for basic thickening properties.

Cost-effective film-former for a wide range of applications.

**Film Forming**

**Pseudo-Plastic**

Solutions of WALOCEL™ CMC exhibit shear-thinning behavior.

Exhibits excellent water-binding capabilities; used as a carrier in hydrophilic solutions, binding other chemicals and particles.

**Binding**

**pH Stability**

Stable in a wide pH range from 3.5 to 12.



# WALOCEL C™ CMC APPLICATIONS

WALOCEL C™ CMC is a versatile water-soluble polymer. Because it is highly effective at low concentrations, it is an excellent economic option for a wide range of industrial applications.



## Specialty Paper

Used in specialty paper applications; used as a coating to improve processing and printing capabilities; used to create an oil-barrier on packaging when a food-contact polymer is necessary.

## Coatings & Inks

Used in water-based coatings and inks formulations for their thickening and rheology modification properties; extremely versatile and economical, offering a natural alternative to synthetic polymers.

## Batteries & Energy Storage

Used in Li-Ion batteries as an anode binder; combined with Styrene Butadiene Rubber to coat graphite onto copper; provides the slurry a suitable viscosity, suspension properties and coating ability; binds the graphite solid particles together; can be used in the cathode and other battery and energy storage devices/applications.

## Adhesives

Used as adhesives to control the viscosity, migration and other essential performance characteristics.

## Agriculture

Used in crop treatment as a stabilizer and rheology modifier; acts as an emulsion stabilizer and promotes good spray homogeneity; products considered inert adjuvants by the EPA and allowed in crop protection products.

## Household Products

Used in consumer and industrial cleaning products such as multi-purpose detergents, shower and toilet cleaners, mildew and lime removal products, etc.

## COMMONLY USED WALOCEL C™ PRODUCTS

WALOCEL C™ CMC comes in a wide range of molecular weights and viscosities to meet your specific needs.

WALOCEL C™ CMC	Viscosity in 2% solution
WALOCEL C™ CRT 30 GA Granular	30 cps.
WALOCEL C™ CRT 30 PA	30 cps.
WALOCEL C™ CRT 100 GA Granular	100 cps.
WALOCEL C™ CRT 100 PA	100 cps.
WALOCEL C™ CRT 1000 GA Granular	1000 cps.
WALOCEL C™ CRT 1000 PA 07	1000 cps.
WALOCEL C™ CRT 2000 GA 07 Granular	2000 cps.
WALOCEL C™ CRT 2000 PA	2000 cps.
WALOCEL C™ CRT 20000 GA Granular	20000 cps.
WALOCEL C™ CRT 20000 PA 07	20000 cps.
WALOCEL C™ CRT 30000 GA Granular	30000 cps.
WALOCEL C™ CRT 40000 GA Granular	40000 cps.
WALOCEL C™ CRT 40000 PA	40000 cps.
WALOCEL C™ CRT 45000 PA	45000 cps.
WALOCEL C™ CRT 60000 GA Granular	60000 cps.
WALOCEL C™ CRT 60000 PPA 07	60000 cps.
WALOCEL C™ XM 3000 PV	3000 cps.

WALOCEL C™ applications summary and selection grid

Applications	WALOCEL™ CMC
Ceramic glazes	●
Energy storage	●
Agriculture, crop protection	●
Pulp and paper	●
Mining	●
Water drilling	●
Other industrial app.	●

● Occasionally used ● Often used - Reference material

## PROCESSING RECOMMENDATIONS FOR WALOCEL C™ CMC



### HOW TO PREPARE AQUEOUS SOLUTIONS OF WALOCEL C™ CMC

WALOCEL C™ CMC polymers are water-soluble; the particles will swell and hydrate to solubilize. To obtain a WALOCEL C™ CMC solution, use the right WALOCEL C™ CMC concentration with the right rate of addition and shear.

Depending on the WALOCEL C™ CMC grade, concentrations in water can reach two to five percent.

In order to prevent lumping at higher concentration levels, we recommend pre-blending WALOCEL C™ CMC with other formulation components.

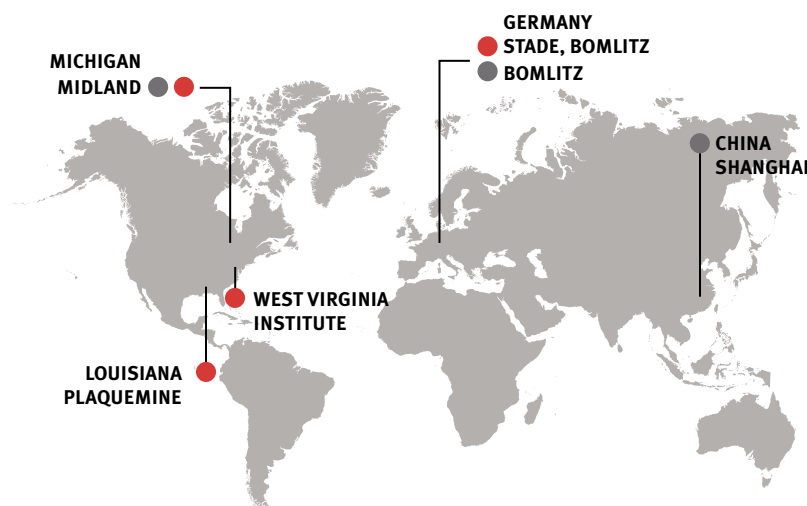
Please contact a DuPont representative for details.

# DUPONT GLOBAL SPECIALTY SOLUTIONS

- Global manufacturing and technology footprint
- Robust business continuity planning procedures and standards
- Sales and technical support network for local customer support
- Three technical support and development (TS&D) facilities
  - » Bomlitz, Germany
  - » Midland, MI, U.S.A.
  - » Shanghai, China

## GLOBAL SPECIALTY SOLUTIONS MANUFACTURING & RESEARCH SITES

5 production sites, 3 R&D/Technical Support and Development (TS&D) centers



## WHAT WE DO

WALOCEL C™ CMC for industrial applications, is available only from DuPont Global Specialty Solutions and its distributors. Global Specialty Solutions, a business unit of DuPont Nutrition & Health (N&H), manufactures cellulosic polymers alongside other N&H portfolio products. The dedicated Global Specialty Solutions team commercializes DuPont products into various global markets.

## OUR CORE VALUES

More than just goals, our core values reflect the way we work every day with our customers and partners in communities around the globe:

- Safety & Health
- Environmental Stewardship
- Respect for People
- Highest Ethical Behavior

## WHO WE ARE

We are innovative problem solvers, drawing on deep application understanding and market insight to help our customers turn challenges into high-value business opportunities.

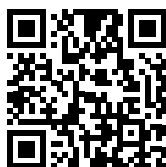
**[Learn more at dupontspecialtysolutions.com](http://dupontspecialtysolutions.com)**



## CONTACT OUR KEY OFFICES

Connect with DuPont sales and application experts to further explore integrating WALOCEL C™ CMC in your application.

[dupontspecialtysolutions.com](https://dupontspecialtysolutions.com)



## PRODUCT SAFETY

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