



惠民製藥股份有限公司

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Cyclocel[®] MC & C Series

**USNF NAME: MICROCRYSTALLINE CELLULOSE AND
CARBOXYMETHYLCELLULOSE SODIUM**

1. Introduction

The MC&C Series is a colloid-forming, co-dried blend of Microcrystalline Cellulose (MCC) and Carboxymethylcellulose sodium (Sodium CMC), which is easily dispersed in water. Sodium CMC serves as a protective colloid by leashing the micro-crystals of MCC together to form a mesh-like powder particle. When the product is readily dispersed in water with moderate mixing, the individual MC&C powder particles disintegrate and form a dispersion of cellulose microcrystal aggregates. These microcrystals create a stable lattice structure for use in the formulation of suspensions and emulsions.

2. Typical properties of MC&C

- Composition – 88-91 pct of microcrystalline cellulose
9-12 pct of sodium carboxymethylcellulose
- Physical Form – A dry, white, odorless, hygroscopic powder. It is insoluble in water, organic solvents, dilute acids and partially soluble in dilute alkaline.
- Thixotropy – MC&C gels are thixotropic and have a finite yield value. Thixotropy of MC&C dispersions can be reduced by addition of CMC or other soluble polymers.

3. Features of MC&C Colloidal Dispersion

- a. Thixotropic properties
MC&C is readily dispersed in water with moderate mixing to form white, opaque, colloidal thixotropic gels. Under shear the gel network readily breaks down; once the source of shear is removed, the gel will reform with minimal loss in viscosity.
- b. Temperature stability
Temperature changes have little effect on the functionality and viscosity of dispersions.

c. Thickening mouthfeel

This product thicken with favorable mouthfeel and without creating a gummy or pasty texture. Unlike some vegetable gum, insoluble microcrystals provide a clean mouthfeel and do not mask flavor.

d. Non-caloric

MC&C is non-caloric, provides dietary fiber and replace some or all of the oil in emulsion-type products.

e. Viscosity is stable over the PH range 6.0 to 10.0

4. Functions

a. Emulsion stabilization

This product maintain a homogeneous state of the system (water/fat/air/etc.). It provides emulsion stability.

b. Stabilizes foam

MC&C gel network locates in the water phase, acting as a physical barrier to hold the air cells in. This product stabilizes the foam and improves overrun control.

c. Control ice crystal growth

This product provides a flexible stabilizing system that allow for reabsorption of water and redispersion of components during the thaw cycle. It helps prevent moisture migration and inhibits the irreversible aggregation of protein and prevents heat shock.

d. Improves the extrusion

Characteristics of frozen desserts even at overrun of 100% and at draw temperatures as high as -4°C .

e. Control melt down in soft serve products

MC&C reduces freezing point and makes products less cold-tasting and controls melt down.

f. Thickening with favorable mouthfeel

g. Modifies viscosity

h. Maintaining the product consistency during sterilization

i. Excellent Suspending Agent

1.2% MC&C gel, either alone or in combination with other hydrocolloids, acts as a well structured suspension vehicles and with thixotropic property.

5. Applications

In food industry – Frozen dessert stabilizer
Emulsion stabilizer
Foam stabilizer
Bodying agent
Suspending agent

In pharmaceutical industry –

Dosage Forms	Applications	Formulation Benefits
Emulsion	- Suspending agent	- Possesses thixotropic properties
Suspension, Suspension type syrups and dried syrup	- Emulsion stabilizer oil / water emulsifier	- Stable over wide PH - stable under extreme temperature - Modifies viscosity
Pellets, granules and tablets	- Binding agent - Improve extrusion character - Disintegrating agent for direct compression tablets	- Producing heavy or dense granules - Increases the fluid-bed granulating speed - Helps insure uniformity of particle size (sphere diameter)

6. Formulation

- a. Dispersions of MC&C flocculated by small amount of electrolyte, cationic polymers and surfactants. Therefore it should be dispersed before adding other ingredients in order to achieve its maximum functionality.
- b. The best protective colloids for use in MC&C dispersion:
 - a. Xanthan gum
 - b. CMC
 - c. Hydroxypropyl methyl cellulose

7. Safety of MC&C

The ingredients of MC&C - microcrystalline cellulose and sodium carboxymethylcellulose - are generally recognized as safe (GRAS) by qualified experts and are in accordance with food & drug regulations

Microbiological Specifications of MC&C

	<u>Per gram</u>
Total Aerobic Microbial Count	Less than 1000
Total Combined Molds and Yeasts Count	Less than 100
Staphylococcus Aureus	Negative
Salmonella Species	Negative
Pseudomonas Aeruginosa	Negative
Escherichia Coli	Negative