

Microcrystalline cellulose (Cellulose gel) 460i

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Introduce

Microcrystalline cellulose is purified, partially depolymerized cellulose which is used as an inactive ingredients in oral pharmaceutical, nutraceutical and food products. It has desiccated and hydrated products. A desiccated product occurs as a white or almost white, odorless, free flowing crystalline powder. A hydrated product occurs as white or almost white, odorless, moist, cotton-like lumps.

Chemical names	Microcrystalline cellulose (Cellulose gel) 460i
CAS Number	9004-34-6
ECHA EC Number	232-674-9
MDL	MFCD00081512
Formula	(C ₆ H ₁₀ O ₅) _n
Category	emulsifiers, stabilizers, anticaking agents, dispersing agents

Variations

International Number	Variant	Name
460/E460	Celluloses	Cellulose
460/E460(i)	i	Microcrystalline cellulose (avicel),(Cellulose gel)
460/E460(i)	i	Microcrystalline cellulose Gel/Colloidal Grade
460/E460(ii)	ii	Cellulose powder

Microcrystalline cellulose (Cellulose gel), 460 (i), is a subclass of Celluloses (E460).

Function & characteristics:

Microcrystalline cellulose is a widely used excipient, an inert substance used in many pill and tablet formulations. As an insoluble fiber, microcrystalline cellulose is not absorbed into the blood stream, so it cannot cause toxicity when taken orally.

Microcrystalline cellulose is mainly used in the pharmaceutical industry as a pharmaceutical excipient, and compared with the starch or starch derivatives has the following advantages.

(1) Microcrystalline cellulose is easy to disintegrate, that is, after entering into the stomach the drug can be easily disintegrated and then absorbed by the body.

(2) Microcrystalline cellulose is difficult to get moldy. This is because the cellulose is β -glucose configuration while the starch is α -configuration. Amylases generally do not attack the cellulose.

(3) The cellulose is not absorbed by the body and is not easy to react with carrying drugs, and therefore more secure.

And As Food additive, Microcrystalline cellulose is mainly used as bonding agent, dilute agent,

disintegrating agent, assist in flowing . It is a naturally derived stabilizer, texturizing agent, and fat replacer. It is used extensively in reduced-fat salad dressings, numerous dairy products including cheese, frozen desserts and whipped toppings, and bakery products.

- 1). Microcrystalline cellulose can maintain emulsification and foam stability.
- 2). Microcrystalline cellulose can maintain high temperature stability.
- 3). Microcrystalline cellulose can improve the liquid stability.
- 4). Microcrystalline cellulose can act as nutritional supplements and thickeners.
- 5). Microcrystalline cellulose has many other uses.

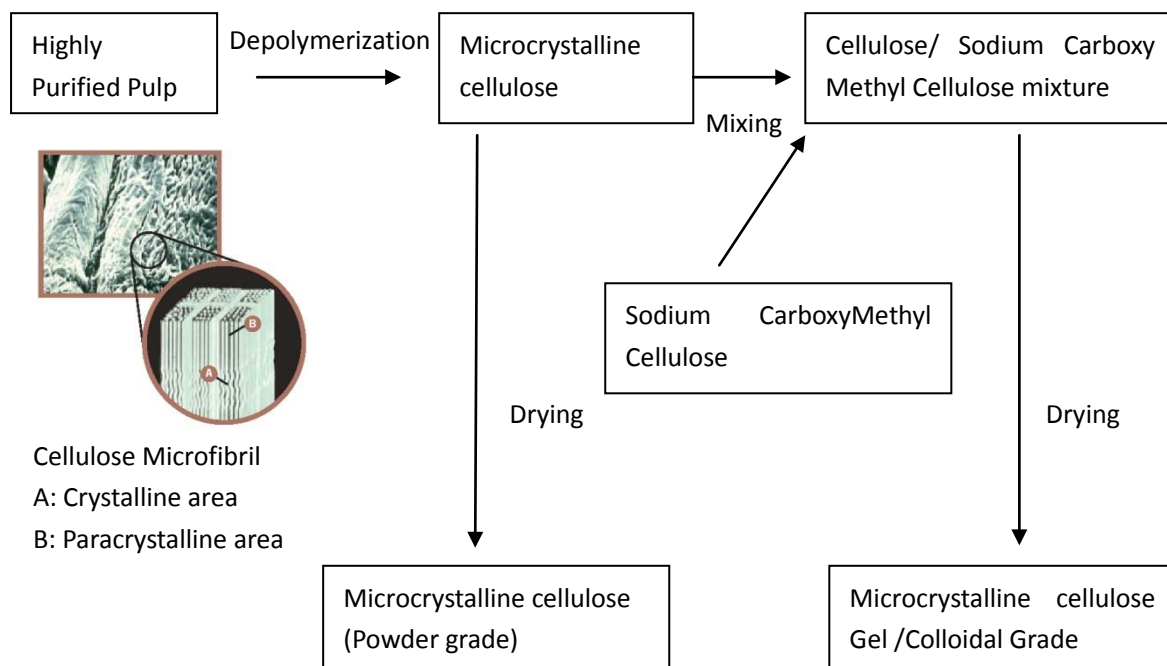
Nutritional Benefits

Typical Nutritional Content of Microcrystalline Cellulose (per 100 grams):

Parameter	Colloidal MCC	Powdered MCC
Total Calories	20 cal	0 cal
Total Fat	0	0
Total Dietary Fiber	93 g	98 g
Soluble Dietary Fiber	5 g	0 g
Sugar	Not Detectable	Not Detectable
Protein	Not Detectable	Not Detectable
Vitamin A	Not Detectable	Not Detectable
Vitamin C	Not Detectable	Not Detectable
Sodium	934 mg	4 mg
Iron	0.5 mg	0.24mg
Calcium	2.0 mg	0.1 mg
Ash	2 g	1 g

Note: These are typical values. Values may vary slight when analysis are performed in other laboratories

Process Flow of Microcrystalline cellulose and Microcrystalline cellulose Gel



Dissolve

As Microcrystalline cellulose is dispersed in water with appropriate shear, the hydrophilic portion is hydrated. This allows the Microcrystalline cellulose to be released and activated, resulting in a stable colloidal network. Critical factors to consider when dispersing the remaining ingredients include:

Order of Addition – Microcrystalline cellulose should ideally be hydrated in water before other ingredients are added. Avicel does not chemically bind water and will not interfere with the subsequent addition of the remaining ingredients.

Type of Shear – the grade or type of Microcrystalline cellulose you select depends on the amount of shear available in your process.

PH of Systems – a protective colloid is recommended to prevent flocculation if the pH of your system is less than 3.8. Suggested protective colloids are xanthan gum, carboxymethylcellulose and methylcellulose. The protective colloid is generally used at 10% of the microcrystalline cellulose level.

Hard Water/Electrolytes – a high level of electrolytes present in the system before the addition of Microcrystalline cellulose may inhibit proper dispersion and require higher shear for good activation.

Methods of Dispersion

Add Microcrystalline cellulose to water while agitating

Add protective colloid if pH of system is less than 3.8



Agitate in a high speed mixer for 5 to 15 minutes (length of dispersion time is dependent on the equipment)



Add the other ingredients

Hold the salts and acids until last



PRODUCT LIST

Pharmaceutical grade	MCC101	MCC102	Specification
Particle Size(> 75 μ m)	30%	45%	MCC 101 
Bulk Density (g/ml)	0.26 - 0.36	0.28 - 0.33	MCC 102 
Usage	Wet/dry granulation extrusion	Direct compression	

Food Grade	
Microcrystalline Cellulose Gel FH-611	Specification 
Microcrystalline Cellulose Food Grade	Specification 

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