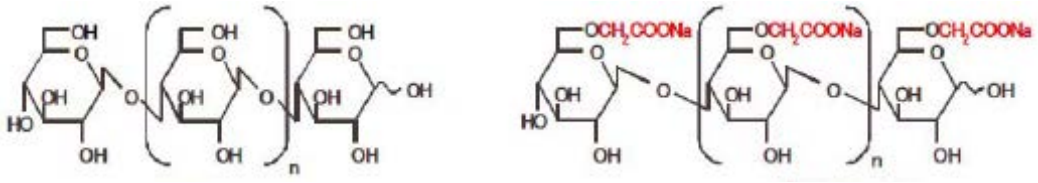
Water-insoluble sodium carboxymethyl cellulose

Sunrose® SLD Series

- Product outline -

Sunrose® is a carboxymethyl cellulose (CMC) produced from carboxymethylated high-purity and biodegradable cellulose that is widely used in various fields and is not only harmless to humans but also features slow biodegradability, making it easy on the environment. NIPPON PAPER CHEMICALS has also developed Sunrose® SLD, slightly carboxymethylated cellulose. This type of CMC combines properties of both powdered cellulose and CMC.



KC Flock
Powdered cellulose
Water-insoluble

Sunrose®
CMC
Water-soluble

Sunrose® SLD
Water-insoluble **Water-soluble**

General quality

Product	SLD-F1	SLD-FM
Appearance	Powder	Fine powder
Average particle size (μm)	50-60μm	15-20μm
Moisture (%)	less than 10.0%	
PH	6.0-8.0	
1% viscosity (mPa·s)	50-150mPa·s	
Degree of etherification (mol/C6)	0.20-0.30mol/C6	
Purity (%)	99.0% or greater	

Basic performance

- SLD Series swells in both cold and warm water, dissolving slightly but not completely, and becomes mildly viscous.
- In water SLD Series exhibits superb dispersion stability and degradability.
- SLD Series prevents other suspended particles from caking and redisperses them.
- SLD Series exhibits excellent water absorption, water retention, shape retention, foam stability, and emulsion stability.
- By absorbing highly concentrated sugar solutions, it prevents “weeping”.

Application fields

Food	Beverages (cocoa, juices containing fiber and pulp, Shiruko, Amazake, etc.); Soups (corn soups, ramen soups, miso soups, consommés); sauces, dressings, ketchups, mayonnaise, jam, and yogurts; whip cream, fillings; tablet disintegrating agents (supplements, etc.); dried goods (dry processed foods, instant ramen, pasta noodles); ice creams, soft ice cream Monakas, edible films, confectionaries (gummies, soft candies); bread (sweet breads, cream-filled breads); other processed foods and ingredients for food processing (powdered azuki, etc.)
Cosmetics	Face powders, foundations, scrub face-washes, facial masks, face-wash foams, face-wash creams, hair mousses, shampoos, soaps, lotions, hair dyes, hair bleaches, mascaras, eye-liners, nails, antiperspirants
Daily goods	Toothpastes; cleansers for kitchen utensils, bathtubs, tiles, cars, etc.; pet foods; air-fresheners; disposable paper toilet seat covers; water-dissolving papers, nonwoven fabrics, etc.
Papers	Paper strengthener, water retention agent, coating agent, bulky papers, yield improving (oxidized titanium, etc.), etc.
Milk substitutes	Dispersion of plant proteins, emulsion stability, improvement in moisture-retaining properties
Filtration (water removal)	Cooking oils, various solvents
Building material	Fiber walls, sand walls, gypsum boards, etc.
Civil engineering	Air bubble shields
Resin fillers, compounds	Styrene foams, biodegradable resins, rubber, ceramics, vinyl chlorides
Paint, varnish, artificial leather	Matte paints, architectural coating/paints, interior coating/paints for vehicles, etc.
Dispersant	Carbon black fine particles, barium sulfate (x-ray contrast agent), oxidized titanium, dispersion of zinc oxide, etc.
Moisture absorption aid	Improves shape retention properties of materials such as calcium chloride and other deliquescent agents when absorbing moisture
Others	Fiber (texture modifier for fabrics and threads), fluid carriers, lubricants, etc.

For more details on our products, please contact:
Nippon Paper Industries Co.,Ltd. < http://www.npchem.co.jp/form/index.html >
Chemical Division 4-6, Kandasurugadai, Chiyoda-ku, Tokyo 101-0062, Japan
Sales Department No.2 Phone: +81-3-6665-5900 Facsimile: +81-3-6665-0360
Kansai Sales Department MID Imabashi Building, 2-3-16, Imabashi, Chuo-ku, Osaka 541-0042, Japan
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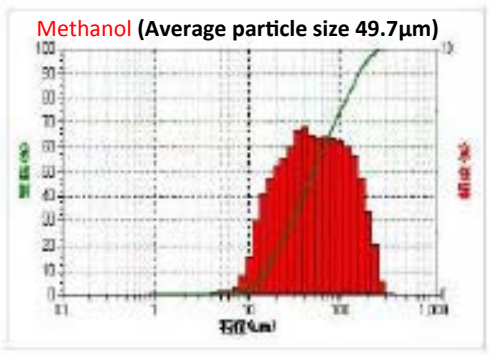
– Physical characteristics, grain size distribution –

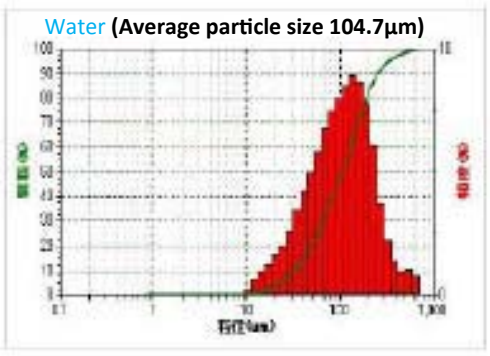
When Sunrose® SLD Series is dispersed in water, the carboxymethylated portion will absorb water and swell. However it does not swell in organic solvents such as methanol. Therefore grain size distribution and average particle size will vary depending on the solvent.

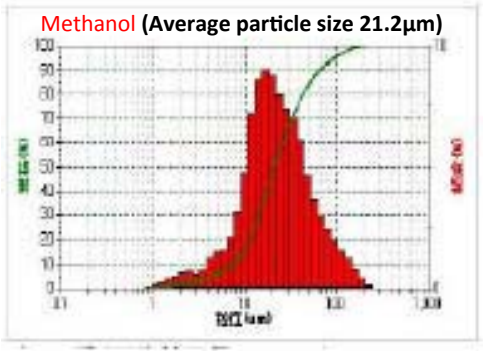
Particles in methanol

Particles in water

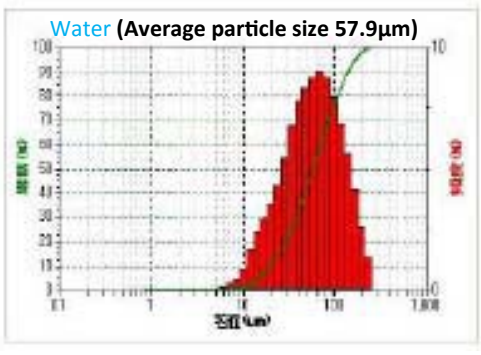


SLD-F1





SLD-FM



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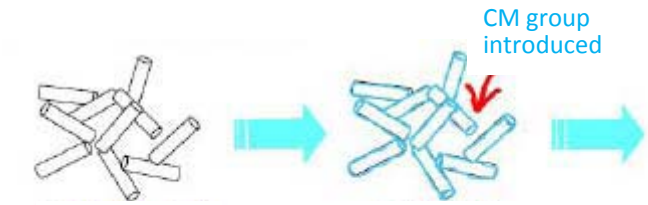
Sunrose® SLD Series

– Water absorption –

Sunrose® is a carboxymethyl cellulose (CMC) produced from carboxymethylated natural cellulose that is widely used in various fields and is not only harmless to humans but is also biodegradable, making it environmentally friendly. NIPPON PAPER CHEMICALS has also developed Sunrose® SLD, slightly carboxymethylated cellulose. This type of CMC combines properties of both powdered cellulose and CMC.

Sunrose® SLD model



In the presence of water…

SLD particles capture water

Water absorption of Sunrose® SLD Series

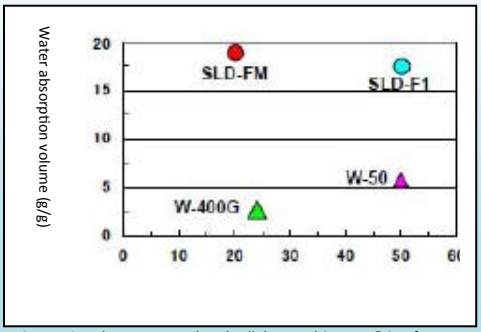
Comparison between powdered cellulose and SLD for average particle size and water absorption

	KC Flock (powdered cellulose)		Sunrose® SLD	
Product	W-50	W-400G	SLD-F1	SLD-FM
Average particle size (μm)	50	24	50	20
Water absorption volume (g/g)	5.7	2.7	17.5	19.0

Sunrose® SLD Series increases its water absorbency by 3 to 7 times compared to powdered cellulose products, ensuring better water retention.

Water-absorption testing

Drip water on a 1-gram sample and measure water absorption (grams of water per gram of sample) to the point where the water begins to seep out.



Comparison between powdered cellulose and Sunrose® SLD for average particle size and water absorption

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Sunrose® SLD Series
– Emulsion stability –

When Sunrose® SLD Series is dispersed in water, the carboxymethylated portion will absorb water and swell, forming a three-dimensional structure.

Emulsion stability of Sunrose® SLD Series

Method for emulsion preparation

An emulsion is prepared by adding each agent (0.5%) to a mixture of water and vegetable oil (50:50), which is then agitated for 5 minutes with a Homo Mixer at 8,000rpm.

Day 1

Day 7

Samples: 1) SLD Series, 2) commercial cellulose formula, 3) CMC, 4) powdered cellulose, 5) control, 6) SLD Series

In an emulsion using the SLD Series, minute drops of oil are dispersed and held within the three-dimensional mesh structure. By preventing the oil droplets from clustering, SLD Series ensures the emulsion remains stable.

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Sunrose® SLD-FM
– Cocoa beverage application –

Sunrose® SLD-FM features excellent dispersion stability in water. When used for preparing colloid beverages such as cocoa, it exhibits superb anti-caking and redispersion properties.

Recipe for cocoa beverage sample

Sample	1	2	3
Cocoa powder (marketed product)	1.0	←	←
Water	99.0	←	←
Third-party cellulose formula	0	0.2	0
SLD-FM	0.2	0	0

Weight section

After preparing a 1% cocoa solution, a predetermined amount of each sample was added and mixed well (stabilizer: 0.2%).

24 hours after preparation

1. SLD-FM
2. Competitor's Products
3. Control

Redispersion characteristics of SLD-FM

When the bottles are shaken once

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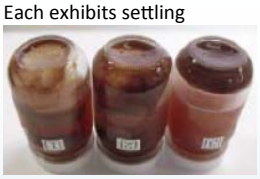
Each exhibits settling



Shaken twice…

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Some redispersion

Shaken three-times

=

Thorough redispersion of SLD

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