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SODIUM CARBOXYMETHYL CELLULOSE  
Papermaking Grade

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## Introduce

Sidley Chemical Co., Ltd. is a company specializing in Research & Development, production and sales of cellulose ethers. Due to many remarkable properties in the papermaking process, sodium carboxymethyl cellulose (CMC) is widely used in many papermaking procedures such as coating, in-pulp adding and Top sizing. Because of its high efficiency and low dosage, CMC has replaced modified starch, PVA, casein and soy protein, and is used for preparation of paper coatings. Sidley has launched NX series products, obtained good applications in the paper industry, and has replaced Finnfix and other international products with its strong competitive advantages in performance and price.

## Product Description :

Sodium Carboxymethyl Cellulose Papermaking Grade is an effective papermaking additive and can be used in many procedures such as pigment coating, adding in the pulp and surface sizing, with good water-retaining property, dispersion and shear thinning property.

Chemical names	Sodium Carboxymethyl Cellulose
CAS Number	9004-32-4
Molecular Weight	6400(±1 000)
Formula	[C <sub>6</sub> H <sub>7</sub> (OH) <sub>2</sub> OCH <sub>2</sub> COONa] <sub>n</sub>
Category	Top sizing, coating, pulping

## Products Specification

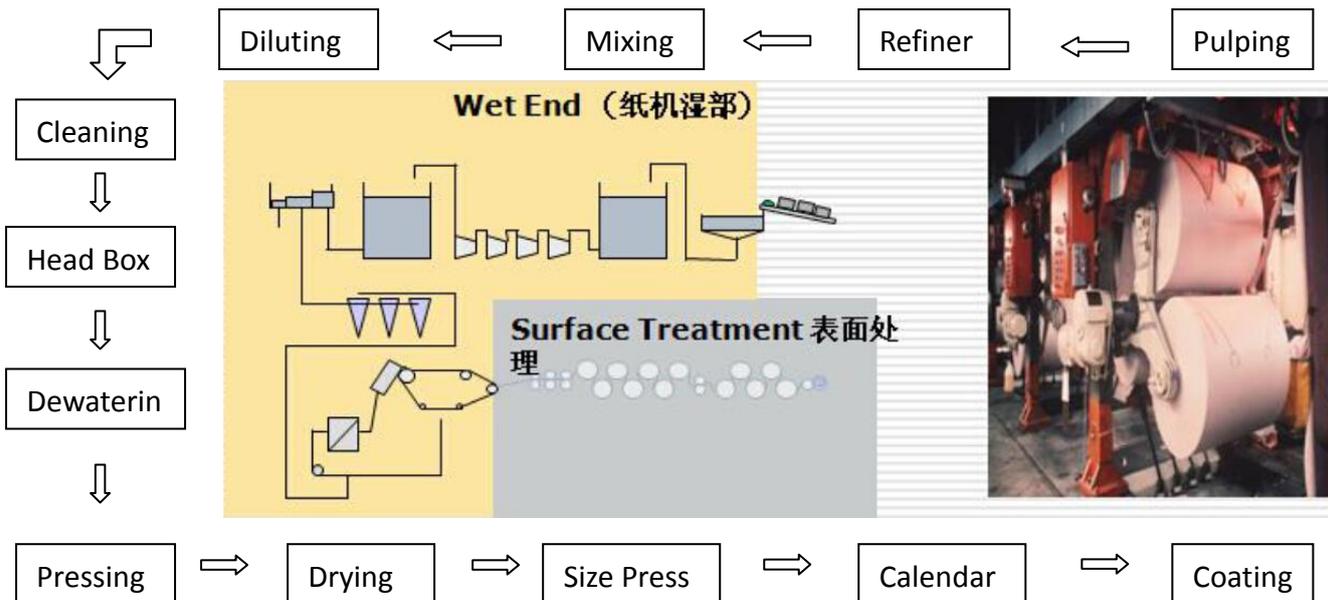
Type	Viscosity, cps(25°C) Brookfield Viscometer	PH	Loss on Drying,%	Degree of Substitution	Usage field
NX-BW1	500-1500 (4%)	6.0-8.5	≤10.0	≥0.60	pulping
NX-BW2	1000-2500 (4%)	6.0-8.5	≤10.0	≥0.70	pulping
NX-30	250-500 (4%)	6.0-8.5	≤10.0	≥0.80	Top sizing ,coating
NX-150	1000-2000 (4%)	6.0-8.5	≤10.0	≥0.80	Top sizing
NX-300	2000-4000 (4%)	6.0-8.5	≤10.0	≥0.80	Top sizing
NX-700	400-1000 (2%)	6.0-8.5	≤10.0	≥0.80	Top sizing
NX-5	20-50 (4%)	6.0-8.5	≤10.0	≥0.85	coating

NX-10	100-250 (4%)	6.0-8.5	≤10.0	≥0.85	coating
NX-BW	≤20 (2%)	6.0-9.5	≤10.0	0.9-1.1	pulping

**Package and storage:** 25kg net in paper bag with inner PE bag. 20 Tons in 20''FCL with pallets; Shelf life (24 months ); Store in cool, dry and ventilated warehouse. Preserve in well-closed containers.



### Process Flow of Paper-Making



### Application of CMC in Paper Coating

#### I The Main Features of NX Series of CMC for Paper Coating

1. Improve the water retention value, in order to prevent the water-soluble adhesive migration into paper, so as to improve the coating flow property, improve the quality of coating;
2. As auxiliary adhesive, it has excellent bonding strength, each NX-CMC can replace 3-4 shares of modified starch or soybean casein, 1.5-2.0 shares of synthetic latex. Thus, decrease the total adhesive to improve the solid content of coating;
3. Have lubricant effect, protect the blade from less wear and prolong the scraper use time;

4. Have a good film-forming property, which is beneficial to the integrity of the film-forming and membrane separation, make coating more clean bright, prevent the "orange peel" phenomenon;
5. As CMC is a structural coating, give coating for "pseudoplastic", under the high shear make the paint thinner, especially suitable for the coating of high solid content and high speed coating;
6. Give Coating with good stability, protect the synthetic adhesive difficult demulsification, maintain the uniformity of coating system, make coating not easy to deterioration during storage;
7. NX-CMC is a good carrier for optical brightening agent, which is beneficial to improve the effect of whitening;

## **II Different Coated Paper Products, Different NX-CMC Model Choice**

The choice of specifications depends on the coating machine speed, coating solids, coating method and the grade of the product. The number after NX-CMC indicate the representative values in viscosity value range by corresponding viscometer in the technical standards stipulated. Due to the bonding strength and film-forming properties of CMC has a positive correlation with its molecular weight, So, on the premise of meeting the coating and its related properties, using high viscosity models of NX-CMC can reduce consumption of adhesive and improve product quality. For example, high solid content at about 50%, (300-400 m/min) cardboard coating, you can choose model between NX-50, NX-100. For high-speed paperboard, coated solid content more than 60%, you can choose between NX-10, NX-20. As the solid content is higher, the selection of viscosity tends to be smaller.

At high speed ,low quantitative coating and lightweight coating, using scraper (sticks) and metering, gluing, press, coating method is very widespread, the used solid content of coating is usually very high, generally between 60-70%,some more than 70%.When the solid content and coating speed is high, to the quality of coating, especially the rheological properties of coating requires higher. To make the ideal coating, adding CMC is indispensable, here select varieties of CMC is usually low viscosity NX-10.

## **III The Dosage and Usage of NX Series of CMC**

CMC used in paper coating is originated in Europe, where coating technology is very advanced in the high speed machine with high solid content. People almost entirely abandoned the modified starch and PVA, and replaced by CMC and synthetic latex. In advanced paper coating formula, CMC is added three shares at most. In addition to the newly built large high-speed paper machine by foreign capital or joint venture, general the dosage of CMC is 0.5 to 1.0. Due to CMC is a relatively expensive chemicals, generally add dosage is to satisfy the performance of the coating. But if the amount is too small, that can not reflect its various advantages. Each user should according to their own "personality" of paper machine to make adjustment test, seek the best types and dosage, in order to obtain the best product quality and the best economic benefits.

Domestic CMC is basically all powder, attention should be paid to when using , don't pour piles into material or solvent in the water, and it should be poured scattered slowly under strong stirring, otherwise will form insoluble block mass to make solution rate lower. The charging principle is applicable to any kind of CMC, So is NX series of CMC. In order to guarantee good usage of CMC, we recommend: for coating preparation system with good dispersion conditions

(mainly refer to stir ability can satisfy the requirement of dissolve), in the preparation of coating which solid content is less than 60%, CMC can be joined after pigment disperse in pigment dispersion slot, then continue to stir at least 40 minutes, pH value in the slot is not less than 8.0. But for the coating of solid content higher than 60%, it is better to use a trough and dissolved the CMC into 4-10% of the solution in advance(lower viscosity of NX-10 into 10% of the solution, NX-20 into 8% of the solution,NX-50,NX-100 into 6% solution, other solution concentration can be adjusted according to the viscosity of high and low order, so as to improve the dissolution rate). Then move the solution to mixed slot confect coating according to the need. In order to accelerate the dissolution, better use 50-70 °C hot water to dissolve, and require high mixing speed (better can reach more than 300 RPM).For Small coating preparation system with good stirring condition, low viscosity CMC do not need dissolve in advance, it can be directly added in the coating mixed slot, after dispersed pigment added, how to add it should depend on the condition of factory equipments.

### **NX Series of CMC is Excellent Surface Sizing Agent**

Paper finished by surface sizing can increase the stiffness, smoothness, and improve the surface strength and porosity, control curling and obtain good printing eligibility. Add a certain proportion of CMC in surface sizing can make the surface obtain a good sealing ability and ink receptive to make color printing more clear and bright, and also save the ink. But because of the price is higher, CMC are usually used only for special requirements such as bond paper, money paper, mold base paper, decorative paper and senior wood paper, when necessary, can also use with modified melamine formaldehyde.

In the use of knife coater for surface sizing process, if only use CMC as surface sizing agent, can choose CMC between NX-100 and NX-600; If it is used with higher viscosity auxiliaries such as modified starch, usually with low viscosity CMC as NX-50, NX-30. In the film squeezing glue, low viscosity CMC can obtain better results than middle or high viscosity CMC. Also, considering the amount used for surface sizing, lightweight or trace gluing, can properly use the higher viscosity model. The embarkation glue soluting concentration should according to the amount of glue adhesive, speed and roller line pressure or scraper (rod) line pressure or other process conditions to determine.

### **NX Series of CMC can be Used as Additive in the Wet End**

Adding CMC in the wet end can play the function of the following aspects:

1. Improve the internal bonding force between the fiber, thus improve the physical strength of paper;
2. Can disperse fibers evenly so as to achieve a better shape;
3. Can be used as pulping sizing agent as gum rosin, AKD, else protective colloid;
4. CMC has a close cooperation with fiber and packing, resulting in a retention effect;
5. Used as expensive cationic wet strength resin retention and can greatly increase the retention of wet strength agent;

Used for wet end additive, degree of substitution (D.S) of CMC, usually control in 0.4-0.8, so it can make the negative charge of CMC drop to a minimum. CMC shall generally be used in

conjunction with cationic starch, however, replace part of the cationic starch with a small amount of CMC, can obtain good synergistic effect. The additive amount of CMC is 0.2 to 0.8 of dry pulp, can choose from NX-200~NX-500. The specific model specifications and dosage should be selected depending on the pulp, product degree of reinforcement and the compatibility with other additives, also can be filtered by the productive experiment, first dissolve it into a solution of 3% or 2% when used(refer to the aforementioned methods),then dilute it to dilute solution of 0.1~0.5% to add into wet end. NX-CMC used with some cationic additives can achieve a ideal effect, particularly with cationic wet strength resin application for life paper such as napkin, sanitary napkin; high strength decorative paper and other specialty paper, can greatly improve the product quality and reduce consumption. But please note that do not use slot when used with cationic additives, more do not mix, in case to reducing effect or losing their efficacy.

**If you want to improve the quality of the paper or paper board in your factory, please choose NX series of CMC. Please try if you have never used it. It maybe will bring surprise to your factory. If you encounter any difficulties in application, please contact with us, we will provide you with professional technical support.**

[www.celluloseether.com](http://www.celluloseether.com)