CMC

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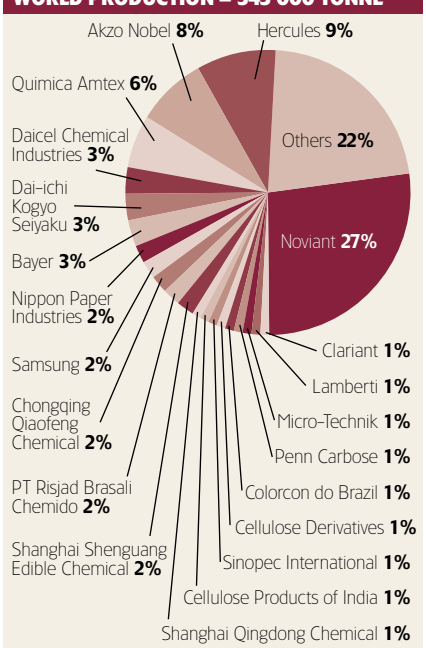
WEST EUROPEAN CMC CAPACITY (2005), '000 TONNE/YEAR

Company	Country	Capacity
Aciselsan	Turkey	3.5
Akzo Nobel	Italy	12
	Netherlands	18
Bayer	Germany	12.1
Hercules	France	15
Lamberti	Italy	5.1
Mare Group	Austria	3
Micro-Technik	Germany	4
Noviant	Finland	73
	Netherlands	10
	Sweden	19
Phrikolat Chemische	Germany	1.5

SOURCE: CHEMPLAN

Chemical Profile is published fortnightly.

GLOBAL MARKET SHARES FOR CMC IN 2004 WORLD PRODUCTION = 343 000 TONNE



SOURCE: TRANTECH

USES

Carboxymethyl cellulose (CMC) is a water-soluble anionic linear polymer. In food, pharmaceutical and cosmetic applications, highly purified types (99.5%+) are required and are referred to as cellulose gum.

Technical grades (90-99.5%) are used in adhesives, coatings, pulp and paper, textiles and other industrial applications. Industrial (50-90%) grades of CMC, which contain large amounts of sodium chloride and sodium glycolate, are used in a number of detergent, mining and petroleum outlets.

Commercial products come in some 500 different grades differing on impurity level, molecular weight, Food and Drug Agency regulation, degree of substitution (DS) and several other factors. The DS level can range from 0.4 to 1.4 but most products have a DS of 0.7. Viscosity ranges from 6000 centiPoise (cP) in 1% solution to 10 cP in 2% solution.

About 28% of global CMC is used in food and beverages, 14% in detergent/laundry applications, 11% in oilfield drilling fluids, 7% in coatings, 7% in drugs and toothpaste. Some 5% is used in cosmetic and personal care, 5% in pulp and paper, 4% in adhesives and 4% in textile, printing and dyeing.

SUPPLY/DEMAND

Global capacity stood at 395 000 tonne/year in 2004, according to TranTech, with 176 000 tonne/year in western Europe, 96 000 tonne/year in Asia-Pacific, 33 600 tonne/year in Japan, 23 000 tonne/year in the US and 21 800 tonne/year in Asia/Middle East. The remaining capacity is located in Latin America, Mexico, eastern Europe and South Africa. Consumption is split 31.7% in Asia-Pacific, 17.5% in western Europe, 12.1% in the US and 8.7% in eastern Europe.

A high volume of imported and exported material flows between the various world regions and western Europe tops the list with exports of nearly 100 000 tonne/year.

PRICING

The price of CMC depends on a number of factors, including purity, DS, viscosity and other properties that vary depending on application. In 2004, highly purified CMC was agreed between €4-4.6/kg while technical grade was €2.75/kg and industrial grade was €2/kg. All prices are for 100% active ingredient basis. Prices have risen in 2005 by 8%, mainly as a result of increased energy costs.

TECHNOLOGY

There are many processes to make CMC, depending on DS level and the quality of the desired product. The most common technology is the reaction of wood pulp with sodium chloroacetate in the presence of an inert water-miscible diluent such as isopropanol, tertiary butyl alcohol, ethanol or a mixture of diluents at 50-70°C. At the end of the reaction, the excess alkali is neutralised and the crude product is purified or partially purified with methanol or another solvent.

In an alternative process, wood pulp is wetted out with aqueous sodium hydroxide. One way to do this is to steep sheeted cellulose in aqueous sodium hydroxide and then press out the excess. The sheets are then shredded and sodium chloroacetic acid is added.

The latter process is frequently used for industrial grades of CMC.

Wood chips and cotton linters are also used for low active ingredient industrial grade and high quality purified CMC, respectively.

HEALTH AND SAFETY

Purified CMC is a white to buff-coloured, odourless and tasteless, free flowing powder. Less purified low assay types can be off-white to a light brown.

Various regulatory authorities have established specifications for the identity and purity of CMC in food uses worldwide.

OUTLOOK

The demand for CMC has been rising steadily at the rate of 2%/year for the past 15 years. The global demand growth is forecast by TranTech at an annual 3% to 2010 with the highest growth rates being expected in Asia-Pacific (5.2%), Asia-Middle East (3.5%), eastern Europe and Latin America (3%), and 1% for the rest of the world.

In food and beverage applications, the average annual growth is expected to total 3% based on increasing demands for low fat foods. An upturn in oil and gas field drilling has boosted consumption of CMC products to 4%/year growth. The use of CMC in textile processing will continue to decline.

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