

CHEMICAL PROFILE Neopentyl glycol

(ICIS Chemical Business)

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Uses

Neopentyl glycol (NPG) is shipped as flake, molten and slurry. It is readily soluble at room temperature in water, alcohols, glycol ethers, ketones and esters. Neopentyl glycol is used primarily as an intermediate in the manufacture of base resins for coatings, especially gel coats and powder coatings. It is also converted to alkyd, polyester and polyurethane resins for water- and solvent-based coatings including high-solid systems in automotive coatings and in coil coatings. Another important use of NPG is an intermediate for hydraulic fluids, synthetic lubricant oils, greases, metal working fluids and aircraft engine lubricants. Other applications include textiles, pharmaceuticals, pesticides, plasticizers and petroleum.

Supply/demand

According to TranTech, the global capacity for NPG stood at 485 000 tonne/year in 2005, with 173 000 tonne/year in Western Europe, 140 000 tonne/year in the US, 134 000 tonne/year Asia Pacific (excluding Japan) and 38 000 tonne/year Japan. Western Europe is the largest consumer at about 118 000 tonne/year, followed by the US at 108 000 tonne/year and Asia Pacific at 94 000 tonne/year. Japan, Latin America, and the Middle East consume 25 700 tonne/year, 10 500 tonne/year and 9 250 tonne/year, respectively. Global demand in 2005 was 380 400 tonne/year.

BASF JCIC, LG Chemical and Perstorp expanded capacity in 2005.

Pricing

The price of NPG depends on its grade (flake, molten or slurry) as well as its purity. Flake grades are most common form of shipment. European prices for the flake grade in the second quarter of 2006 were negotiated between €1.65/kg and €1.85/kg. Contract prices for the US and Asia Pacific for 6/2006 were \$1.80-2.0 and \$1.8-1.95 respectively.

Technology

There are two main routes leading to NPG. Both processes use isobutyraldehyde and formaldehyde as raw materials. In one process, raw materials are allowed to react with a strongly alkaline catalyst, such as sodium hydroxide, potassium hydroxide or calcium hydroxide, to form NPG. However, in this process large amounts of formate salts are formed as by-product. The process is therefore economically suitable only when a profitable use is found for the formate. In the second process, the aldolization reaction is carried out in the presence of an amine catalyst, such as triethylamine, whereby hydroxypivaldehyde is formed. This is further hydrogenated at the presence of a catalyst such as Ni/Cr on silica, promoted copper chromite or other hydrogenation catalyst. Usually a solvent, such as methanol or methanol/water is used in hydrogenation step. This process is more common in the industry. The reaction product, Molten NPG is solidified by means of flaking roll or a crystallizing belt or cooling belt

Health and safety

NPG is a white, crystalline solid with a mint-like odor. Finely dispersed particles form explosive mixtures in air. Neopentyl glycol reacts violently with oxidants. Health effects of exposure to NPG have not been investigated adequately.

Outlook

Global demand growth is forecast at 3.1%/year to 2010. Regionally, consumption will rise by 6%/year in Asia-Pacific, 3.5%/year in Africa, Asia/Middle East and Eastern Europe, 2.2%/year in Americas, 2%/year in Western Europe and Australia/New Zealand and 1.3%/year in Japan.

Shahid Rasuli in Bandar Imam, Iran will start a 12 000 tonne/year plant in 2007. Shandong Guanghe Fine Chemical expanded to 10 000 tonne/year in 2006. Mitsubishi Chemical and Mitsubishi Gas formed a joint venture in 9/2005 and may increase the capacity to 50 000 tonne/year. Mitsubishi Chemical is providing raw materials to the joint venture.

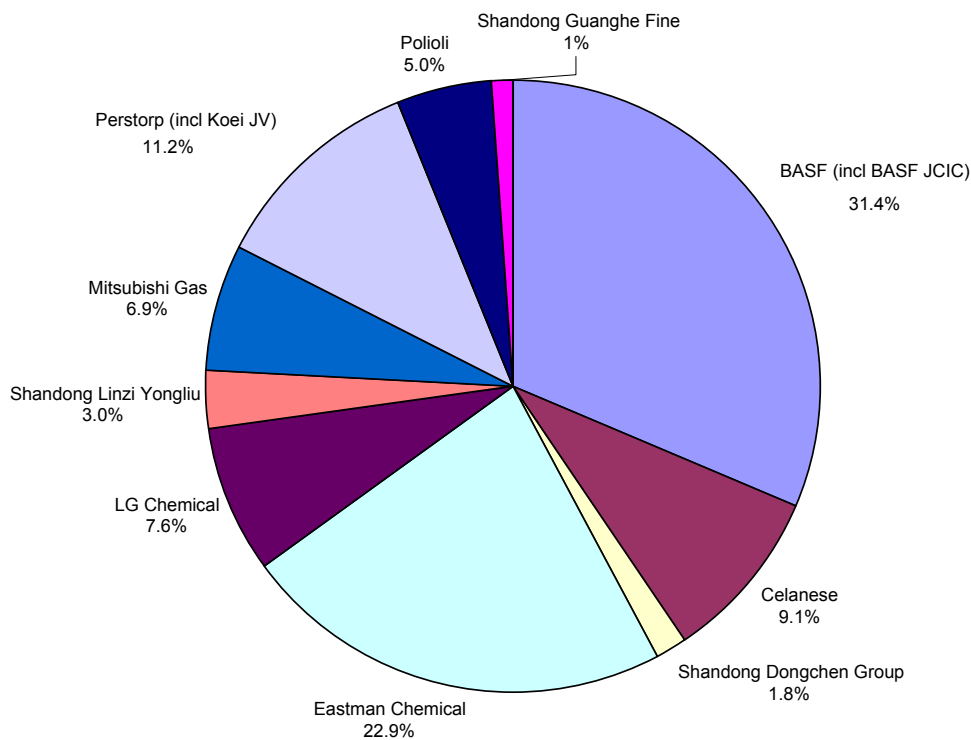
GLOBAL NPG Capacity '000 TONNE/YEAR IN 2005

Company	Location	Capacity (kt)
Eastman Chemical	Longview, Texas, US	80
BASF	Freeport, Texas, US	60
BASF	Ludwigshafen, Germany	60
LG Chemical	Yeochun, South Korea	50
Perstorp	Perstorp, Sweden	50
Celanese	Oberhausen, Germany	40
Mitsubishi Gas	Mizushima, Japan	35
BASF JCIC	Jilin, China	25
Eastman Chemical	Pulau Seraya, Singapore	24
Polioli	Vercelli, Italy	23
Shandong Linzi Yongliu	Zibo, China	20
Shandong Dongchen Group	Dongying, China	10
Shandong Guanghe	Dongying, China	5
Koei-Perstorp Chemical	Chiba, Japan	3

NPG applications

Use	%
Coatings	42.0
Automotive parts/insulation	10.5
Construction insulation	9.5
Furniture/footwear	6.3
Plasticisers	5.3
Electronic products	5.2
Automotive/construction adhesives	4.2
Lubricants	3.2
Fibres	2.1
Pharmaceuticals	2.1
Others (more than 20 applications)	9.6

Global Market Shares for NPG in 2005



Total world demand=389 400 tonne

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