

# Neopentyl glycol

## USES

Neopentyl glycol (NPG) is used primarily in base resins for coatings. Important uses are also found in hydraulic fluids, synthetic lubricant oils, greases, metal-working fluids and aircraft engine lubricants. Other outlets include textiles, pharmaceuticals, pesticides, plasticisers and petroleum. NPG is shipped as flake, molten and slurry.

## SUPPLY/DEMAND

Global capacity stood at 485,000 tonnes/year in 2005, with 173,000 tonnes/year in western Europe, 140,000 tonnes/year in the US, 134,000 tonnes/year in Asia-Pacific (excluding Japan) and 38,000 tonnes/year in Japan, according to consultancy TranTech.

Western Europe is the largest consumer at about 118,000 tonnes/year, followed by the US at 108,000 tonnes/year and Asia-Pacific at 94,000 tonnes/year. Japan, Latin America and the Middle East consume 25,700 tonnes/year, 10,500 tonnes/year and 9,250 tonnes/year, respectively. Western Europe and the US are the world's biggest exporters at 31,000 tonnes/year and 16,300 tonnes/year, respectively. Asia-Pacific was a net importer in 2005 by 5,500 tonnes.

BASF JCIC, LG Chemical and Perstorp hiked capacity in 2005 and Shandong Guanghe doubled output in 2006.

## PRICING

The price of NPG depends on grade as well as purity, with flake grades the most

commonly shipped. European prices for flake in the second quarter were between €1.65/kg and €1.85/kg. Contract prices for the US and Asia-Pacific in June were \$1.8–2.0/kg and \$1.8–1.95/kg, respectively.

## TECHNOLOGY

There are two main routes to NPG using isobutyraldehyde and formaldehyde. In one, the raw materials react with a strongly alkaline catalyst to form NPG. But, large amounts of formate salts are formed as byproduct and the process is only economically viable when a profitable use is found for the formate.

In a second and more common process, the aldolisation reaction is carried out in the presence of an amine catalyst. This is further hydrogenated in the presence of a catalyst and the molten NPG is solidified by means of a flaking roll, or a crystallising or cooling belt.

## HEALTH AND SAFETY

NPG is a white, crystalline solid with a mint-like odour. Finely dispersed particles form explosive mixtures in air and it reacts violently with oxidants.

## 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 the Americas, 2%/year in western Europe and Australia/New Zealand, and 1.3%/year in Japan.

Powder coatings based on NPG show improved impact and scratch resistance, and high gloss. Synthetic lubricants made from NPG provide good lubricity and reduced corrosivity. Both of these uses will grow over 5%/year to 2010.

Shahid Rasuli in Bandar Imam, Iran, will start production at a 12,000 tonnes/year plant in 2007. Mitsubishi Chemical and Mitsubishi Gas formed a joint venture in September 2005 to produce and sell polyvalent alcohols, and they may raise NPG capacity to 50,000 tonnes/year.

## GLOBAL NEOPENTYL GLYCOL CAPACITY '000 TONNE/YEAR

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

Source: TranTech

## NPG APPLICATIONS

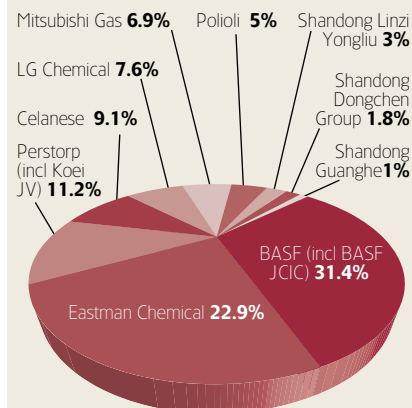
Use	%
Coatings	42.0
Automotive parts/insulation	10.5
Construction insulation	9.5
Furniture/footwear	6.3
Plasticisers	5.3
Electronic products	5.2
Automotive/construction adhesives	4.2
Lubricants	3.2
Fibres	2.1
Pharmaceuticals	2.1
Others (more than 20 applications)	9.6

SOURCE: TRANTECH

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## GLOBAL MARKET SHARES FOR NPG IN 2005

Total world demand: 389,400 tonnes



SOURCE: TRANTECH