

CHEMICAL PROFILE: PVP

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USES

Polyvinylpyrrolidones (PVP) are water-soluble polymers with many uses that are determined by its co- and ter-polymer, and ionic type, including as a binder, bodying or curl control agent, dispersant, expedient, fixative, film former, stabilizer, thickener and sustained release agent. About 27% of global PVP goes into pharmaceutical uses, 26% in cosmetic/personal care market, 8% in food applications, 5% each in coatings, detergents, adhesives, printing/inks and photography, 2% in consumer products and 1% or less in textiles, polish, petroleum, agriculture, petroleum, chemical manufacturing and enzymes. PVP is available in liquid or solid state under different forms, the most common being powder, aqueous and organic solutions. PVP is offered as homopolymer, cross-linked and over 30 cationic, anionic and non-ionic co-and ter-polymer products.

SUPPLY/DEMAND

Global capacity for PVP stood at 76,300 ton/year in 2013, 29,200 ton/year in the US, followed by 25,100 ton/year in Asia Pacific, 11,700 ton/year in Western Europe, 8,900 ton/year in Japan, 800 ton/year in Eastern Europe and 600 ton/year in Asia Middle East. The US is also the biggest consumer of PVP at 19,300 ton/year, followed closely by Western Europe at 19,300 ton/year and Asia Pacific at 17,600 ton/year. Other regions each consumed less than 2 ton/year. The US is also the world's leading net exporter of some 7,700 ton/year. Western Europe is the largest net importer of PVP of over 7,000 ton/year. China has built capacity in recent years and exported 6,800 ton/year. Global demand for all types of PVP was 67,500 ton/year in 2013, broken down to polyvinylpyrrolidone-vinyl acetate with 13,400 ton/year; polyvinylpyrrolidone dimethylaminoethyl methacrylate diethyl sulfate (PQ-11) with 8,200; polyvinylpyrrolidone-Iodine with 7,100 ton/year; polyvinylpyrrolidone cross linked with 5,900 ton/year; polyvinylpyrrolidone vinylimidazole dimethyl chloride (PQ-16) with 3,200 ton/year; polyvinylpyrrolidone vinylimidazole (PQ-44) with 1,600 ton/year; polyvinylpyrrolidone vinylimidazole (PQ-44) with 1,600 ton/year; polyvinylpyrrolidone methacrylamidopropyl trimethylammonium chloride (PQ-28) with 760 ton/year. All the values are based on 100% basis active ingredient.

PRICING

The price of PVP depends on co- and ter-monomer type and content, as well as purity and its physical form. In general, the higher the cationic content of PVP, the more expensive it is. Prices in the first quarter of 2014 for powder grade PVP were between \$9-18/kg, and low cationic aqueous solution grades between \$14-24/kg.

TECHNOLOGY

There are two main routes leading to PVP. The first one goes through a solution polymerization of N-vinyl-2-pyrrolidone (VP) in organic solvent, followed by steam stripping. The clear aqueous solution is dried or shipped as aqueous solution. The second route involves aqueous solution polymerization of VP monomer with water soluble cationic, anionic or nonionic monomers. The polymer is usually shipped as aqueous solution although in some cases it is spray dried for long distance shipping. Liquid PVP is easier to dissolve but also harder to ship than its solid counterpart.

OUTLOOK

Demand has been rising in past years, driven in particular by cationic PVP in cosmetic/ personal care applications, PVP-iodine in anti-microbial and cross-linked PVP in beverages. Global demand growth is forecast at 5.3%/year to 2018. The highest growth is expected in Asia-Pacific where consumption will rise at 10%/year, and new capacity will be needed. Demand in Eastern Europe and Asia/Middle East will grow at 5%/year. Other regions will grow at a rate of between 3-4%/year. The cationic PVP is growing over 6%/year globally. The major outlet for these products is in cosmetic/personal care applications.

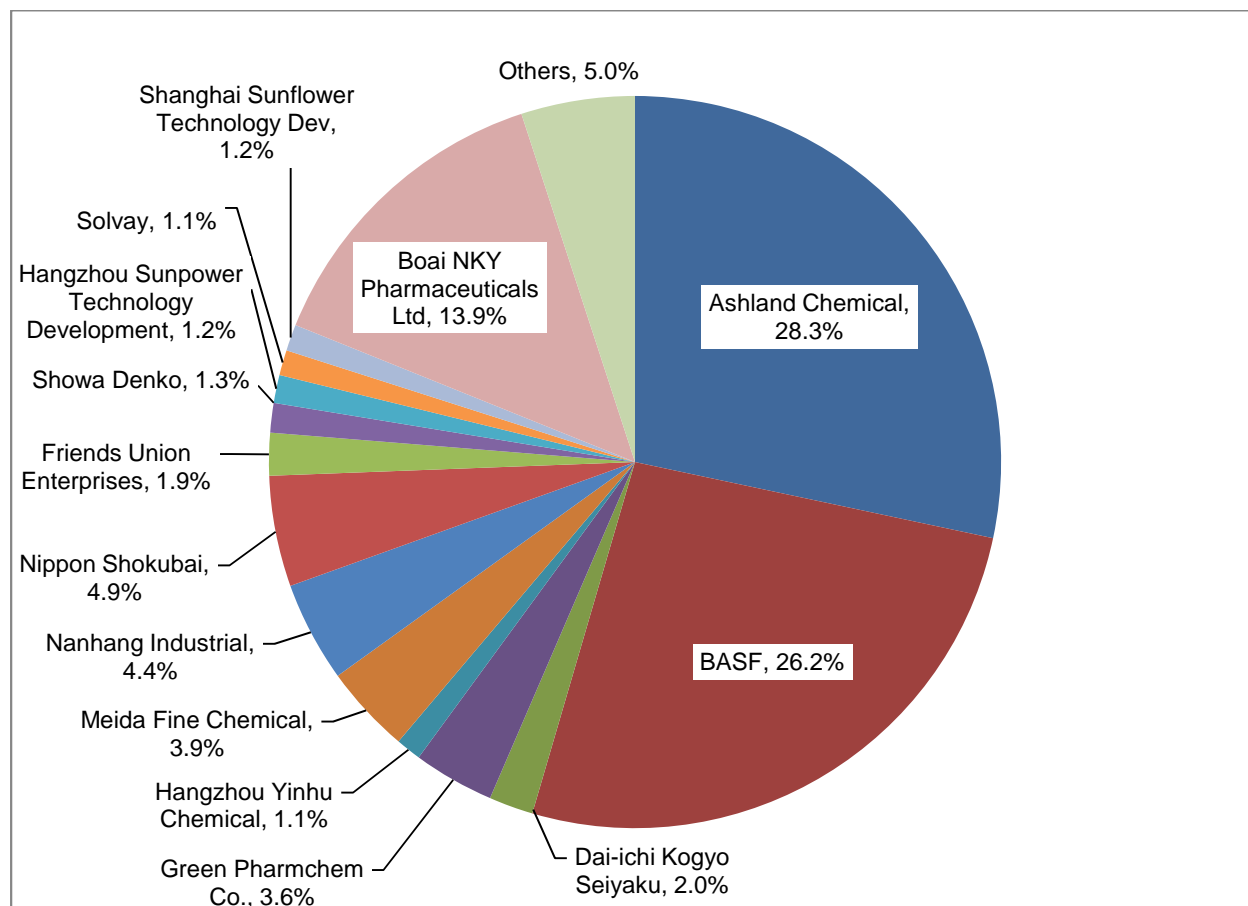
MAJOR GLOBAL PVP CAPACITY IN 2013, '000 TON/YEAR^(*)

COMPANY	LOCATION	CAPACITY
Anhui Harvest Fine Chemical	China	0.50
Ashland	KY, USA	15.00
	TX, USA	6.00
BASF	Japan	1.10
BASF	USA	8.20
BASF	Germany	10.50
Boai NKY Pharmaceuticals Ltd	Two locations, China	11.5
Dai-ichi Kogyo Seiyaku	Japan	1.50
Friends Union Enterprises	China	1.50
Green Farmchem	China	3.00
Hangzhou Peak Chemical	China	0.55
Hangzhou Yinhu Chemical	China	0.41
Jiaozuo Meida Fine Chemical	China	1.00
Mitsubishi	Japan	0.50
Nanhang Industrial	4 locations, China	3.50
Nanjing Jinlong	China	0.41
NIPPON SHOKUBAI	Japan	4.50
Novocherkassk	Russia	0.80
Shanghai Sunflower Technology Dev	China	1.00
Shanghai Sunpower	China	1.00
Shanghai Well Tone	China	0.50

Showa Denka	Japan	1.00
Solvay	France	1.00

(*) Over 0.4 kt

GLOBAL MARKET SHARES FOR PVP IN 2013



For more information about market and site-specific/technology-specific investment and production cost data for PVP and some 1000 more chemicals, please send your inquiries to trantech@chemplan.biz.