

Rapid Development of China's Acrylic Ester Sector

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The development of China's acrylic ester sector started in the 1950s. In 2002, China's total capacity to make acrylic esters was only 233 thousand t/a, and the output was 232 thousand tons. After 2005, with the completion and startup of a number of new plants, both the capacity and output of acrylic esters increased rapidly. In 2006, the capacity and output of acrylic esters were 1.121 million t/a and 610 thousand tons, respectively, and by 2011, they had reached 1.416 million t/a and 1.163 million tons. In 2011, China had 11 acrylic ester producers (see Table 1), and the domestic capacity and output of acrylic esters achieved a year-on-year growth of 14.1% and 13.7%, respectively. In 2011, Shanghai Huayi Acrylic Acid Co., Ltd and Zhejiang Satellite Petro Chemical Co., Ltd both increased their capacity for acrylic esters, making the two companies' acrylic ester capacity rank first and second in China, respectively. During 2012-2015, a number of other acrylic ester projects will be constructed or planned for construction in China, of which major new entrants are as follows:

1. CNOOC Huizhou Project: CNOOC Huizhou Project includes capacity of 140 000 t/a acrylic acid (including 40 thousand t/a high purity acrylic acid), 100 thousand t/a butyl acrylate, 20 thousand t/a methyl acrylate, 20 thousand t/a ethyl acrylate and 20 thousand t/a 2-ethylhexyl acrylate.
2. Yip's Chemical Holdings Limited: On September 19, 2011 Yip's Chemical Holdings Limited announced plans to invest RMB300 million to build an 80 thousand t/a butyl acrylate production line in Jiangmen of Guangdong province. The production line was expected to be completed and put into operation in September 2012.
3. Jiangsu Sanmu Group Co., Ltd: Jiangsu Sanmu Group Co., Ltd successfully put its new 60 thousand t/a acrylic acid unit into operation in January 2012.
4. Yantai Wanhua Polyurethanes Co., Ltd: On November 25, 2011, Yantai Wanhua Polyurethanes Co., Ltd announced plans to invest RMB1.48 billion in a propylene oxide and acrylic ester integration project. The project includes a 600 thousand t/a propane dehydrogenation unit to make propylene, a 240 thousand t/a propylene oxide unit, a 225 thousand t/a butanol unit, a 300 thousand t/a acrylic acid along with a matching acrylic ester unit, and a 300 thousand t/a polyether polyols unit as well as other accessory engineering and public engineering.

B Coatings is the major sector consuming acrylic esters in China. Acrylic esters are mainly used to produce all kinds of polymers. These polymers have unique properties like excellent weather resistance, ultraviolet resistance, heat resistance and water resistance, and they can be extensively used in sectors such as coatings, adhesives, textile, leather, paper-making and plastic additives. In 2011 China's total consumption of acrylic esters was around 1.16 million tons. Coatings: Ethyl acrylate and butyl acrylate are the major acrylic esters that are used in the production of acrylic coatings, and 2-ethylhexyl acrylate and methyl acrylate come next. Around 80% China's acrylic coatings are water-based polymer products and the rest are solvent-based polymer products. Owing to their excellent weather resistance, transparency, chemical resistance and mechanical strength, acrylic polymers are extensively used in the coatings sector. Adhesives and sealants: In the adhesives and sealants sector, acrylic esters are mainly used to produce emulsion pressure-sensitive adhesives and solvent-based pressure-sensitive adhesives, and the major varieties of acrylic esters being used are butyl acrylate and 2-ethylhexyl acrylate. Major varieties of pressure-sensitive adhesives in China include polyacrylate pressure-sensitive adhesives, rubber pressure-sensitive adhesives and hot melt pressure-sensitive adhesives. Polyacrylate pressure-sensitive adhesives are mainly emulsion polyacrylate pressure-sensitive adhesives, accounting for more than 65% of the total. Textiles: The varieties of acrylic esters that have the most applications in the textile sector are ethyl acrylate and butyl acrylate. Acrylic emulsion polymers are widely used in coating printing, electrostatic flocking, non-woven fabrics, artificial furs, spraying collodion cotton, carpet sizing along with the sizing of many kinds of chemical fiber fabrics, and coating processing, etc. Chemical Fibers: At present, most polyacrylonitrile fibers in the world are produced by using ternary copolymers, of which the added amount of acrylonitrile, the second monomer and the third monomer accounts for 90%-94%, 5%-8% and 0.3%-2% of the total, respectively. The second monomer includes methyl acrylate, methyl methacrylate, vinyl acetate and acrylamide, etc. It is expected that China's consumption of acrylic esters in the production of polyacrylonitrile fibers will change little. Others: The application of acrylic esters in other sectors includes base materials for paper coatings, primers for treating leather, and raw materials in the synthesis of acrylate rubbers. Export: Since 2005, China's capacity to make acrylic esters has expanded constantly and has gradually come to meet the domestic market demand. The import volume of acrylic esters in China has decreased year-on-year, while the export volume has grown rapidly. In 2011 China's output, apparent consumption and net export volume of acrylic esters were around 1.163 million tons, 1.16 million tons and 3 thousand tons, respectively, and the self-sufficiency rate reached 100.2%. With the constant growth of acrylic esters output, the self-sufficiency rate of acrylic esters in China will increase. With the successive startup of a new round of new acrylic acid and ester units and the constant growth of downstream demand, driven by the rapid development of acrylic acid, China's output of acrylic esters is expected to climb rapidly. China's production of acrylic esters can soon fully meet the domestic market demand, and the net export volume is hoped to increase continually.

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