

## **METHYL METHACRYLATE**

Methyl methacrylate (MMA) is an organic compound with the formula  $\text{CH}_2=\text{C}(\text{CH}_3)\text{COOCH}_3$ . This colourless liquid, the methyl ester of methacrylic acid (MAA) is a monomer produced on a large scale for the production of poly(methyl methacrylate) (PMMA) but another major application is in surface coatings.

MMA is also used as co monomer in methyl methacrylate butadiene styrene resins, used as a modifier for polyvinyl chloride (PVC). Methyl Methacrylate Monomer offers significant advantages as an additive in a wide range of copolymer-based products and is used in molding and extruded resins and extruded sheet (PMMA), in mineral surface composites, and coatings.

Emerging uses of MMA in digital signboards and displays in the advertising industry and in optical applications such as LCD, LED screens, and flat panel displays in the electronics industry are stimulating growth in the market. Growing healthcare spending is spurring demand for PMMA in the production of medical devices.

MMA is used for the production of pure or almost pure homopolymers (PMMA), but there is also wide variety of copolymer uses. Within the PMMA consumption categories, the largest is for cast and extruded transparent acrylic sheet (PMMA sheet).

Liquid crystal displays : Acrylics is used in Liquid Crystal Displays (LCD) and the current and projected growth for large LCD screens for home theatre etc. has been a major driver for MMA expansions, especially in Asia, where virtually all the LCD manufacturing market is now concentrated.

Moulding resins : MMA is used in the production of moulding resins (excluding the resin beads prepared for extruded acrylic sheet production). Most of the final products are destined for automotive parts and electrical appliances.

Surface coatings : MMA is used for the production of surface coatings, both for industrial solvent based systems and increasingly, for water based acrylic dispersions for domestic and industrial use.

MMA is used in water based acrylic dispersions for exterior masonry and wood coatings and semi gloss emulsions for interior decorative coatings.

Gujarat State Fertiliser Company (GSFC) is the only producer of MMA in India.

Installed capacity of 5,000 metric tonne per annum of MMA, along with plants for PMMA sheets (2,000 metric tonne per annum) and PMMA pellets (1,500-metric tonne per annum ).

The consumption pattern of MMA in India differs from that of the rest of the world. The major use of the monomer in India is in the coatings industry, which accounts for about 70% of total consumption. Only 12% of total consumption is for making PMMA sheets and mouldings. Other applications include small uses of textile auxiliaries, sizing materials, modifier for PVC modifiers etc.

With over 70% of Methyl Methacrylate (MMA) used in the production of Polymethyl Methacrylate (PMMA), the growing demand for PMMA against the backdrop of strong electronics production is benefiting growth in the MMA market. The growth in the market is also benefiting from emerging new applications of MMA, and its derivatives in a wide range of industries. Construction and automotive industries represent other major end-users of MMA in addition to electronics. Recovery in global GDP is poised to benefit consumption of MMA and its derivatives in architecture and construction, guided by the improving investments in residential and commercial construction projects. Stable automobile production trends worldwide are also expected to help boost global consumption of MMA.

Polymethyl Methacrylate (PMMA) is expected to emerge as a substitute for existing medical polymers, against the backdrop of growing concerns over the health hazards caused by the use of PVC and polypropylene in addition to low biocompatibility issues. The presence of phthalate plasticizers in PVC is generating significant interest in PMMA in the healthcare industry. The growing use of plastics as a result of the increased focus on manufacturing light vehicles is helping spur demand for MMA/PMMA in automobile production. Stringent vehicle emission norms worldwide will additionally lend traction to growth in this sector. The automotive industry is one of the largest end user of MMA especially in molding and extrusion compounds. The use of MMA/PMMA in automotive plastics in addition to weight reduction also helps minimize vehicle vibration, cabin insulation, noise control, and enhance aesthetics. Specialty products such as optical-grade plexiglass, compact disk plexiglass and radiation shielding plexiglass are expected to offer lucrative growth potential. PMMA liquid membrane roofing system is a major advancement in the market, used in a wide range of applications including plaza decks, garden roofs, small roofs and irregular shaped roofs. The PMMA liquid membrane system is widely used in roofing crews owing to several benefits such as substrate compatibility, ease of use, speed and versatility

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