

METHYL METHACRYLATE (MMA)

Monomers Technical Service Note TS/C/2108/4

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| Name of product | Methyl methacrylate |
| Chemical formula | CH ₂ :C(CH ₃).CO.OCH ₃ |
| Alternative name | 2-propenoic acid, 2-methyl-, methyl ester |
| UN number | 1247 |
| CAS number | 80-62-6 |

Physical Properties.

| | |
|--|---|
| Molecular weight | 100.1 |
| Boiling point | 100.5°C at 1013 mbar (760 mm Hg) |
| Freezing point | -48°C |
| Density (kg/m³) | 949 @ 15.5°C |
| Refractive index (n_D²⁰) | 1.414 |
| Vapour pressure | 37 mbar @ 20°C 244 mbar @ 60°C |
| Vapour density (Air = 1) | 3.46 |
| Flash point | 10°C Closed Cup |
| Viscosity (mPa/s) @ 20°C | 0.58 – 0.63 |
| Specific heat (kJ/kg/°C) | 2.02 |
| Thermal conductivity (W/m²/°C) | 0.1488 |
| Surface tension (N/m) | 4.42 x 10 ⁻² |
| Auto ignition temperature | 421°C |
| Solubility @ 20°C | Miscible with most organic solvents. Solubility of monomer in water: 1.6% Solubility of water in monomer: 1.15% |
| Heat of polymerisation (kJ/mol) | 57.7 |
| Tg of homopolymer | 105°C (378K) |

Further physical properties data are available on request.

Please refer to the MSDS for Safety, Health and Environment information.

Product Purity.

| | Units | Specification ^{a)} | Typical Analysis ^{b)} |
|-------------------------------|---------|-----------------------------|--------------------------------|
| Appearance | ----- | CLFFVFM ^{c)} | CLFFVFM ^{c)} |
| Colour | Hazen | 5 max. | <5 |
| Purity | % w/w | 99.90 min. | 99.97 |
| Water | ppm w/w | 500 max. | 17 |
| Acidity (as methacrylic acid) | ppm w/w | 35 max. | 11 |

a) At time of issue

b) On manufacture

c) CLFFVFM = Clear liquid free from visible foreign matter

Stability and Handling.

Methyl methacrylate, if unstabilised, will polymerise rapidly under the influence of heat and/or light. To prevent premature polymerisation of the monomer during storage and transport, a small amount of radical scavenger is added as stabiliser. The effectiveness of the phenolic stabilisers used is dependant on the presence of oxygen in the monomer. For this reason **it is essential that the monomer is stored in contact with air and not under an inert atmosphere.**

The standard stabilisers are hydroquinone (HQ), methyl ether of hydroquinone (MEHQ) and 2,4-dimethyl-6-tertiary butyl phenol ('Topanol' A or TA). Lucite International can advise on the most appropriate stabiliser system.

Provided proper storage and handling procedures are followed (see material safety data sheet and the brochure "Storage and Handling of Methacrylate Ester Monomers" - TS/AG/2414) the product may be stored for up to 6 months from date of receipt. Product stabilised with less than 25 ppm Topanol A should be used within 3 months.

Application Benefits of MMA.

Methyl methacrylate can be polymerised with a wide range of co-monomers in bulk, suspension, solution, emulsion and other processes to improve polymer properties such as hardness, gloss, and weatherability. Methacrylate based (co)polymers retain their properties better than many other polymer systems. Further information, data and advice is available on request.

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This note does not constitute a formal specification although the specification parameters and typical analysis are correct at the time of issue of this note. Users should refer to the relevant product specification (S/I/MM) for the up to date specification including details of test methods and other information. **The information contained in this note is believed to be accurate but Lucite International accepts no liability for any loss, claim or damage resulting from any use thereof.**

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