SPECIALTY METHACRYLATES

VISIOMER®

EVONIK
Leading Beyond Chemistry

Creating possibilities for a sustainable world.

Methacrylate monomers are among the most versatile and efficient building blocks of macromolecular chemistry. VISIOMER® Specialty Methacrylates serve a broad range of industries and applications and enable individual and sustainable effects for your products in the field of adhesives, paints and coatings, composite resins, construction materials as well as various special applications.

Working in close partnership with our customers we go beyond existing technologies, cooperating closely to develop customized and innovative solutions for replacing hazardous or harmful substances, facilitating weight reduction in construction materials and reducing carbon footprint, all to make your products more environmentally friendly, efficient and long lasting.

Outstanding solutions arise from mutual inspiration, so we enthusiastically invite our customers to join our sustainability journey — **Creating possibilities for a sustainable world.**

Our VISIOMER® ToolBox describes the entire range of Specialty Methacrylate monomers, complemented by technical information, Life Cycle Assessments, Safety Data Sheets, and more to support your product development activities from early design to high performing finished products and beyond.

For more details please visit our VISIOMER® ToolBox on www.visiomer.com or get in touch with us under: visiomer@evonik.com

CONTENTS

COATINGS

VISIOMER® methacrylates provide coatings with outstanding performance and make your resin partially biorenewable.

Automotive Coatings

VISIOMER® Terra IBOMA provides weather- and scratch resistance to solvent borne (SB) coatings and allows for reduction of solvent content without compromising levelling and gloss. Resins with VISIOMER® IBOMA show fast physical drying and contribute to carbon footprint reduction of your paints.

Protective Coatings

VISIOMER® HEMA-P 70 M enables superior adhesion to polar surfaces like minerals, glass, and metals. In direct to metal coatings, VISIOMER® HEMA-P 70 M enhances corrosion resistance.

Benefits

- Excellent weather- and scratch resistance
- SB coatings with low VOC, fast physical drying and outstanding leveling and gloss
- Excellent adhesion and corrosion resistance

VISIOMER® methacrylates take shear stability, usability and performance of emulsion paints to a higher level.

Architectural Coatings

VISIOMER® MPEG 750 MA W and **VISIOMER® MPEG 1005 MA W** provide water borne paints with excellent low temperature stability against agglomeration.

VISIOMER® MPEG 500 MA is a water- and label free polymerizable surfactant, that can be used for secondary dispersions and as pigment dispersant.

VISIOMER® MEEU improves paint adhesion and wet scrub resistance of wood coatings.

VISIOMER® C18 PEG 1105 MA W promotes associative thickening for better sag control.

VISIOMER® Terra C13-MA and **VISIOMER® Terra C17,4-MA** enhance hydrophobicity of emulsion paints, strengthen resin resistance against polar media and reduce their carbon footprint.

Benefits

- Excellent shear stability, viscosity control and adhesion of emulsion paints to a variety of substrates
- Higher resistance against polar chemicals
- Resins with low carbon footprint

ADHESIVES

VISIOMER® methacrylate monomers are used in reactive two-component adhesive and sealant formulations. Most popular are anaerobic or structural adhesives, based on methacrylates. Emulsion polymers for pressure-sensitive adhesives and sealants also contain VISIOMER®.

Selected Solutions

VISIOMER® Terra IBOMA, VISIOMER® BNMA and **VISIOMER® c-HMA** are used in combination with VISIOMER® crosslinkers for the formulation of structural adhesives with low hazard potential and low vapor pressure.

VISIOMER® MEEU is used to improve adhesion and cohesion of emulsion polymers for PSAs.

Benefits

- Enhanced cohesive strength and resistance
- Formulation components with low hazard potential
- Increased adhesion to polar surfaces

COMPOSITE RESINS

Evonik's methacrylates Business Line offers a wide range of low-volatile and low-odor methacrylate monomers for full or partial substitution of styrene in composite resins. They are used as reactive diluents or cross-linkers in unsaturated polyester resin (UPR) or vinyl ester formulations.

Selected Solutions

VISIOMER® 1,4-BDDMA, VISIOMER® EGDMA and **VISIOMER® PEG 200 DMA** are used as reactive diluents to improve mechanical properties.

VISIOMER® HEMA-P improves adhesion to glass fibers and flame retardancy in composite resins.

Benefits

- Low-odor, reactive diluents
- Improved mechanical properties
- Superior adhesion
- Flame retardancy

CONSTRUCTION

Acrylic materials based on methacrylate monomers are proven solutions in the construction industry. In applications like industrial flooring, reactive road markings, liquid water proofing systems, concrete admixtures and chemical anchoring, methacrylates are easy to process and cure rapidly even at low temperatures.

Selected Solutions

Formulations of water soluble **VISIOMER® MPEG MAs** and **VISIOMER® DMAPMA** with hydrophilic crosslinkers like **VISIOMER® PEG 200 DMA** are well established as injection gels.

VISIOMER® MPEG MAs are important building blocks for the synthesis of super plasticizers for concrete admixture systems.

VISIOMER® 1,4-BDDMA, VISIOMER® TRGDMA and **VISIOMER® PEG 200 DMA** are used for chemical anchoring.

Benefits

- Fast curing, even at low temperatures
- Low-odor, reactive diluent
- Chemical stability

SELECTED SOLUTIONS FOR SPECIAL APPLICATIONS

Methacrylates are versatile monomers used in many different application areas. Due to their properties ranging from very hydrophilic to hydrophobic, and imparting T_gs from –70 °C up to 150 °C, VISIOMER® specialty methacrylates offer the opportunity to tune resin properties and to impart special functionality.

Electrical Insulation Varnishes

VISIOMER® 1,4-BDDMA and **VISIOMER® TMPTMA** are used as reactive diluents for electrical insulation varnishes.

Surfactants & Thickeners

VISIOMER® MPEG MAs are used as polymerizable surfactants in emulsion polymerization or as comonomers of polymeric surfactants.
VISIOMER® C18 PEG 1105 MA W is a specialty methacrylate for the synthesis of associative thickeners for emulsion paints.

3D printing

VISIOMER® HEMATMDI, VISIOMER® TRGDMA and **VISIOMER® PEG 200 DMA** are used in dental compounds, adhesives for dental applications and for 3D printed aligners.

Benefits

- Tunable resin properties by functional comonomers
- Crosslinkers for improved mechanical and chemical resistance

VISIOMER® TERRA — SUSTAINABLE PERFORMANCE WITHOUT COMPROMISE

Customers and formulators are switching to more sustainable materials, demanding uncompromising products with reduced carbon footprints and improved safety profiles – supported by a supply chain strategy that is there when you need it, today and for the sustainable future.

At Evonik, these questions drive our scientists to create products that are meeting tomorrow's market needs for high performing, sustainable monomers.

VISIOMER® biobased specialty methacrylate monomers from Evonik offer outstanding performance from an established partner you can trust.

VISIOMER® biobased specialty methacrylate monomers

A growing number of resins for coatings, personal care, adhesives, composites, construction and more already benefit from **VISIOMER® Terra** monomers.

For more than a decade, Evonik has produced monomers made from up to 85% biobased and recycled raw materials under the growing **VISIOMER® Terra** brand, part of our long-term strategy to protect the environment and mitigate climate change without compromising performance. **VISIOMER® Terra** biobased monomers must not only meet the highest performance requirements, they must also have a low hazard potential and be designed for environmental friendliness. Increasing adoption rates mean that prices are becoming increasingly affordable, too.

The bio-content of **VISIOMER® Terra** products is independently certified by DIN CERTCO, registration number 8C284.

Additional Life Cycle Assessments provide a comprehensive data set you can use to confirm the beneficial effects of **VISIOMER® Terra** biobased monomers in your products.

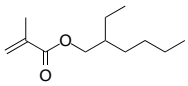
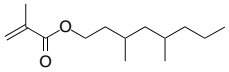
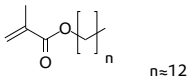
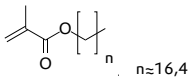
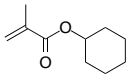
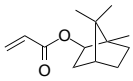
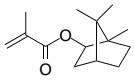
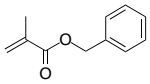
Changing performance demands means our portfolio of biobased monomers keeps expanding. Talk to Evonik about what we can do for you.

VISIOMER® Terra products surpass the properties of biobased methacrylates with respect to the following criteria:

- Bio-Carbon content of up to 85 %
- Bio-Carbon content verified and certified by independant third party
- No severe health or environmental hazards
- Life Cycle Analysis data available

Product	Bio-carbon content
VISIOMER® Terra IBOMA	71%
VISIOMER® Terra C13-MA	76%
VISIOMER® Terra C17,4-MA	81%

ALKYL/ARYL (METH)ACRYLATES

VISIOMER®	Chemical Name	Formula	Glass transition Temperature T_g	Main applications
EHMA	2-Ethylhexyl methacrylate CAS No. 688-84-6		–10 °C	
IDMA	Isodecyl methacrylate CAS No. 29964-84-9		–30 °C	
Terra C13-MA	Methacrylic ester 13.0 CAS No. 90551-76-1	 n≈12	–46 °C	
Terra C17,4-MA	Methacrylic ester 17.4 CAS No. 90551-84-1	 n≈16,4	–22 °C	
c-HMA	Cyclohexyl methacrylate CAS No. 101-43-9		110 °C	
IBOA	Isobornyl acrylate CAS No. 5888-33-5		96 °C	
Terra IBOMA	Isobornyl methacrylate CAS No. 7534-94-3		150 °C	
BNMA	Benzyl methacrylate CAS No. 2495-37-6		54 °C	

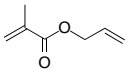
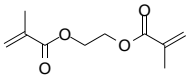
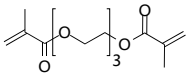
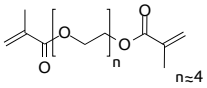
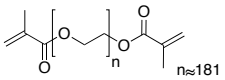
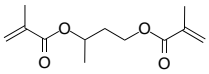
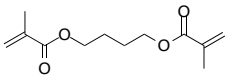
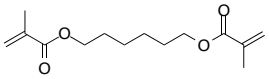
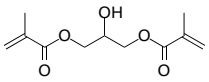
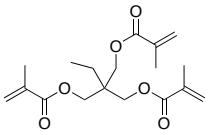
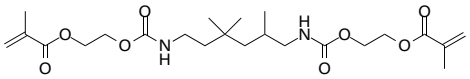
For further information visit our VISIOMER® ToolBox.

VISIOMER® biobased specialty methacrylate monomers

Application Areas:

Coatings · Adhesives · Composites · Construction · Plastics · Textile & Leather · Oil & Gas · Paper & Water · Personal Care & Health Care · Synthesis

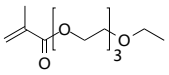
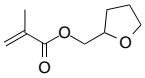
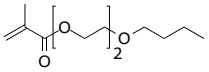
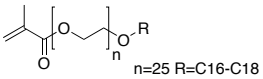
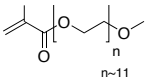
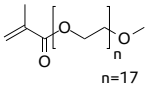
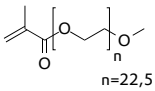
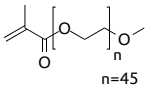
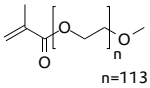
CROSSLINKERS

VISIOMER®	Chemical Name	Formula	Main applications
AMA	Allyl methacrylate CAS No. 96-05-9		
EGDMA	Ethylene glycol dimethacrylate CAS No. 97-90-5		
TRGDMA	Triethylene glycol dimethacrylate CAS No. 109-16-0		
PEG 200 DMA	Polyethylene glycol 200 dimethacrylate CAS No. 25852-47-5		
PEG 8000 DMA W	Polyethylene glycol 8000 dimethacrylate (50% in water), CAS No. 25852-47-5		
1,3-BDDMA	1,3-Butanediol dimethacrylate CAS No. 1189-08-8		
1,4-BDDMA	1,4-Butanediol dimethacrylate CAS No. 2082-81-7		
1,6-HDDMA	1,6-Hexanediol dimethacrylate CAS No. 6606-59-3		
GDMA	Glycerol dimethacrylate CAS No. 28497-59-8		
TMPTMA	Trimethylolpropane trimethacrylate CAS No. 3290-92-4		
HEMATMDI	Diurethane dimethacrylate CAS No. 72869-86-4		

Application Areas:

Coatings · Adhesives · Composites · Construction · Plastics · Textile & Leather · Oil & Gas · Paper & Water · Personal Care & Health Care · Synthesis

ETHER/ACETAL METHACRYLATES

VISIOMER®	Chemical Name	Formula	Glass transition Temperature T_g	Main applications
ETMA	Ethyl triglycol methacrylate CAS No. 39670-09-2		–31 °C	
THFMA	Tetrahydrofurfuryl methacrylate CAS No. 2455-24-5		40 °C	
BDGMA	Butyl diglycol methacrylate CAS No. 7328-22-5		–56 °C	
C18 PEG 1105 MA W	Methacrylic ester (25 EO) C16-C18 fatty alcohol (in water/GMAA) CAS No. 70879-51-5	 n=25 R=C16-C18	–	
MPEG 500 MA	Methoxypolyethylene glycol 500 methacrylate CAS No. 26915-72-0	 n~11	– 61 °C	
MPEG 750 MA W	Methoxypolyethylene glycol 750 methacrylate (50% in water) CAS No. 26915-72-0	 n=17	–	
MPEG 1005 MA W	Methoxypolyethylene glycol 1000 methacrylate (50% in water) CAS No. 26915-72-0	 n=22,5	–	
MPEG 2005 MA W	Methoxypolyethylene glycol 2000 methacrylate (50% in water) CAS No. 26915-72-0	 n=45	–	
MPEG 5005 MA W	Methoxypolyethylene glycol 5000 methacrylate (50% in water) CAS No. 26915-72-0	 n=113	–	

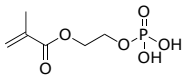
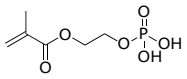
For further information visit our VISIOMER® ToolBox.

VISIOMER® biobased specialty methacrylate monomers

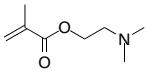
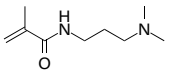
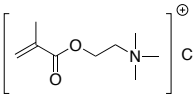
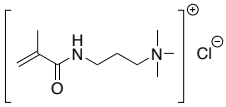
Application Areas:

Coatings · Adhesives · Composites · Construction · Plastics · Textile & Leather · Oil & Gas · Paper & Water · Personal Care & Health Care · Synthesis

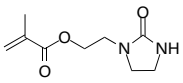
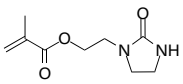
PHOSPHATE METHACRYLATES

VISIOMER®	Chemical Name	Formula	Main applications
HEMA-P 70 M	2-Methacryloyloxyethyl phosphate 70% solution in methyl methacrylate CAS No. 52628-03-2		
HEMA-P 100	2-Methacryloyloxyethyl phosphate CAS No. 52628-03-2		

AMINO METHACRYLATES

VISIOMER®	Chemical Name	Formula	Glass transition Temperature T_g	Main applications
MADAME	2-Dimethylaminoethyl methacrylate CAS No. 2867-47-2		18 °C	
DMAPMA	3-Dimethylaminopropyl methacrylamide CAS No. 5205-93-6		96 °C	
TMAEMC	2-Trimethylammoniumethyl methacrylate chloride (75% in water) CAS No. 5039-78-1		–	
MAPTAC	3-Trimethylammoniumpropyl methacryl-amide chloride (50% in water) CAS No. 51410-72-1		–	

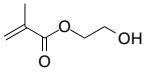
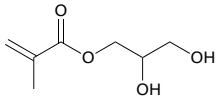
WET ADHESION MONOMERS

VISIOMER®	Chemical Name	Formula	Main applications
MEEU 50 W	N-(2-Methacryloyloxyethyl) ethylene urea (50% in water) CAS No. 86261-90-7		
MEEU 25 M	N-(2-Methacryloyloxyethyl) ethylene urea (25% in methyl methacrylate) CAS No. 86261-90-7		

Application Areas:

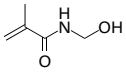
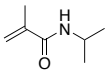
Coatings · Adhesives · Composites · Construction · Plastics · Textile & Leather · Oil & Gas · Paper & Water · Personal Care & Health Care · Synthesis

METHACRYLATES FOR CONTACT LENSES

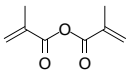
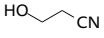
VISIOMER®	Chemical Name	Formula	Glass transition Temperature T_g	Main applications
UHP-HEMA	2-Hydroxyethyl methacrylate CAS No. 868-77-9		55 °C	
Terra GMMA	Glycerol monomethacrylate CAS No. 5919-74-4		–	

VISIOMER® biobased specialty methacrylate monomers

SPECIALTY METHACRYLAMIDES

VISIOMER®	Chemical Name	Formula	Main applications
N-MMAA	N-Methylol methacrylamide (60% in water) CAS No. 923-02-4		
N-iPMAA	N-Isopropyl methacrylamide CAS No. 13749-61-6		

SPECIALTY INTERMEDIATES

VISIOMER®	Chemical Name	Formula	Main applications
MAAH	Methacrylic anhydride CAS No. 760-93-0		
ECH	Ethylene cyanohydrin CAS No. 109-78-4		

Application Areas:

Coatings · Adhesives · Composites · Construction · Plastics · Textile & Leather · Oil & Gas · Paper & Water · Personal Care & Health Care · Synthesis

EUROPE, AFRICA, MIDEAST

EVONIK OPERATIONS GMBH

Kirschenallee
64293 Darmstadt
Germany

ASIA

EVONIK SPECIALTY CHEMICALS (SHANGHAI) CO., LTD.
OIL ADDITIVES

55 Chundong Road,
Xinzhuang Industry Park,
Shanghai 201108,
China

AMERICAS

EVONIK OIL ADDITIVES USA, INC.

723 Electronic Drive
Horsham, PA 19044-4050
USA

Phone +1 215 706-5800
Toll-free +1 888 876-4629

visiomer@evonik.com www.visiomer.com

VISIOMER®

EVONIK
Leading Beyond Chemistry