Composite

Product guide V.1

We Enable the transformation of Light for a Better Future

IGM RESINS

UV Curing for Composite

UV CURING RAW MATERIAL AND TECHNICAL SOLUTION PROVIDER

IGM Resins is the leading global provider of energy curable raw material solutions to a wide variety of industries such as graphic arts, industrial coatings, adhesives, composites and 3D printing. The combination of our global presence, unique market driven and customer focused approach, technical and regulatory support, and our comprehensive portfolio of products covering photoinitiators, monomers, oligomers and additives, is the cornerstone of our success.

Our dedication to energy curing technology and the markets we serve is emphasized by the development of next generation products for innovative integrated solutions, and ongoing investment into state-of-the-art manufacturing capabilities.

EXPLORING THE ADVANTAGES OF UV CURING FOR THE COMPOSITES INDUSTRY

UV curing can provide significant benefits to composite production processes where the UV light can directly access the matrix, such as:

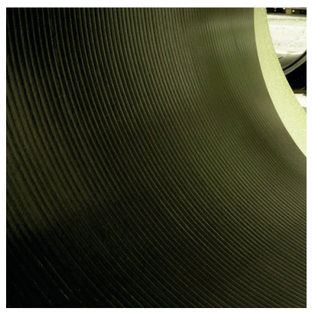
- Continuous Sheets
- Pultrusion
- Filament winding
- Cured-in-Place-Pipe (CIPP)
- Vacuum infusion
- Gelcoats
- Prepregs
- Other open mould processes such as hand lay-up

HOW TO GET MORE FROM US

UV curing has great advantages to offer to the composites industry:

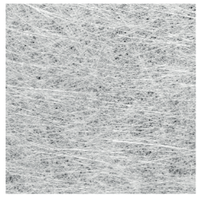
- Fast mould release, higher mould utilization rate
- Push button cure
- Endless pot-life reducing waste and cleaning
- High quality and reliability (one component system)

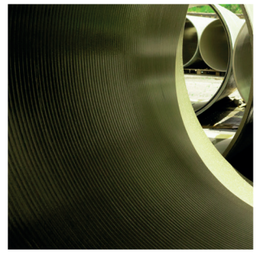
Our technical team is here to offer you support and advice to help you meet your goals. For our full product range, please refer to the UV/EB Radcure Product Guide or visit our website.



	Cold Cure	Hot Cure	UV Cure
Cure time	Hours	Minutes to hours	Seconds to minutes
Potlife	Hours	Hours	Unlimited potlife
Mould utilization rate	Low	Medium	High
Reinforcement	All fiber types	All fiber types	Mainly glass fiber
Resin waste	Approx. 5-10%	< 5%	Re-use possible
Styrene emission*	High	Medium	Low (fast cure)
Curing equipment	None or limited equipment required	Heating chamber, oven, heated mould	UV/LED equipment
Investment required	Low	High	Medium
Energy consumption	Low	High	Medium



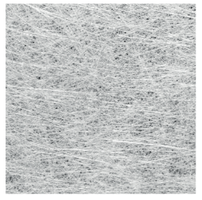



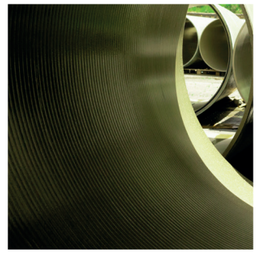




Chemical Identity		Cas No.	Molecular Weight | g/mol	Melting Point | °C	UV-absorption (lambda max) | nm	Through Cure	Surface Cure	LED Cure
PHOTOINITIATORS - TYPE I								
Omnirad 184*	1-hydroxycyclohexyl-phenyl ketone	947-19-3	204.3	44-50	243, 331	••	•••	•
Omnirad 1173	2-hydroxy-2-methyl-1-phenylpropanone	7473-98-5	164.2	Liquid at room temperature	244, 330	••	•••	•
Omnirad TPO-L	Ethyl(2,4,6-trimethylbenzoyl)-phenyl phosphinate	84434-11-7	316.4	Liquid at room temperature	230, 275, 370	•••	•	•••
Omnirad 819	Bis(2,4,6-trimethylbenzoyl)phenylphosphine oxide	162881-26-7	418.5	127-133	237, 275, 380	•••	•	•••
Omnirad 2100	Blend of Omnirad 819 + Omnirad TPO-L			Liquid at room temperature	220, 275, 370	•••	•	•••
Omnirad 2022	Blend of Omnirad 1173 + Omnirad TPO-L + Omnirad 819			Liquid at room temperature	245, 285 , 370	•••	•	•••
Omnirad 380	Bis(2,4,6-Trimethylbenzoyl)phenylphosphine oxide	162881-26-7	418.5	127-133	237	•••	•	•••
Omnirad BDK	2,2-dimethoxy-2-phenylacetophenone	24650-42-8	256.3	64-67	252, 325	•••	•••	•
PHOTOINITIATORS - TYPE II								
Esacure 3644	Ketocoumarin	2243703-91-3		68-71	325, 375	•••	•••	•••

Products are subject to availability per region






	Chemical Identity	Cas No.	Melting Point | °C	UV-absorption (lambda max) | nm	Through Cure	Surface Cure	LED Cure
CATIONIC PHOTOINITIATORS							
Omnicat 250	75% solution of Iodonium, (4-methylphenyl)[4-(2-methylpropyl)phenyl]-, hexafluorophosphate(1-) in propylene carbonate	344562-80-7 + 108-32-7	Liquid at room temperature	240	•••	••	
Omnicat 432	Mixed triarylsulfonium hexafluorophosphate salts (45%) in propylene carbonate (55%)	68156-13-8 + 74227-35-3 + 108-32-7	Liquid at room temperature	210, 300	••	••	
SENSITISERS AND PHOTO ACID GENERATORS							
Esacure 3644	Ketocoumarin	-	67-72	325, 375	•••	•••	•••
Omnirad 1173	2-hydroxy-2-methyl-1-phenylpropanone	7473-98-5	Liquid at room temperature	244, 330	••	•••	•

	Chemical Identity	Cas No.	Typical Viscosity | mPa.s at T °C	T (°C)	Colour | APHA max	Product Attributes	Reactivity	Hardness	Flexibility	Yellowing	Adhesion
CATIONIC OLIGOMERS											
Omnilane OC1005	(3-4-epoxycyclohexane) methyl3'-4'-epoxycyclohexyl-carboxylate	2386-87-0	400	25	100	Fast cure, heat resistant, adhesion	•••	•••	•	•••	•••
Omnilane OC3005	Bis(7-oxabicyclo[4.1.0]hept-3-ylmethyl) adipate	3130-19-6	575	25	250	Fast cure, higher flexibility, adhesion	•••	•••	••	•••	•••

Products are subject to availability per region

EPOXY ACRYLATES

Chemical Identity		Functionality	Typical Viscosity | mPa.s at T °C	T | °C	Colour | Gardner max	Tensile Strength | psi	Elongation | %	Tg | °C	Product Attributes	Reactivity	Hardness	Flexibility	Yellowing Resistance	Adhesion	Pigment Wetting
Photomer 3016	Bisphenol A epoxy diacrylate	2	5500	60	1			60	Gloss, chemical resistance, coating hardness	••	•••	•	•	•	••

ALIPHATIC URETHANE ACRYLATES

Chemical Identity		Functionality	Typical Viscosity | mPa.s at T °C	T | °C	Colour | Gardner max	Tensile Strength | psi	Elongation | %	Tg | °C	Product Attributes	Reactivity	Hardness	Flexibility	Yellowing Resistance	Adhesion	Pigment Wetting
Photomer 6008	Aliphatic urethane triacrylate	3	16000	60	1	76*	6	106	Coating hardness, tensile strength, chemical resistance, non-yellowing	••	•••	••	•••	•	
Photomer 6019	Aliphatic urethane triacrylate	3	3250	60	1	79*	4	96	Coating hardness, tensile strength, adhesion, non-yellowing	••	•••	••	•••	••	
Photomer 6024	Aliphatic urethane diacrylate	2	45000	25				-51	Good flexibility, yellowing resistance and good UV/EB cure reactivity	••	•	•••	•••	•••	
Photomer 6210	Aliphatic urethane diacrylate	2	12000	25	1	20*	40	30	Ease of handling, scratch resistance, flexibility, impact resistance, adhesion, non-yellowing	••	••	•••	•••	•••	
Photomer 6230	Aliphatic urethane diacrylate	2	3500	60	1	17*	40	49	Abrasion resistance, impact resistance, low odour, adhesion, non-yellowing	••	••	•••	•••	•••	

MONOMER ACRYLATES

Chemical Identity		Cas No.	Functionality	Typical Viscosity | mPa.s at 25 °C	Colour | APHA max	Tg | °C	Surface Tension 25°C | m n/m	Product Attributes	Reactivity	Hardness	Flexibility	Yellowing Resistance	Adhesion	Pigment Wetting
PureOmer 4012	Isobornyl acrylate (IBOA)	5888-33-5	1	10	50	88	32	Solvency, adhesion, good flexibility, thermoforming. Bio-based Content (ASTM D6866-21) : 78 %	••	•	••	••	•••	•
Photomer 4017 (LT)	Hexanediol diacrylate (HDDA)	13048-33-4	2	8	60	41	35	Adhesion, chemical resistance, high solvency and cutting power	•••	•••	•	•••	•••	••
Photomer 4061 (LT)	Tripropyleneglycol diacrylate (TPGDA)	42978-66-5	2	14	100	64	32	Versatile, good flexibility and high reactivity	••	••	•	••	••	•
Photomer 4071	3 methyl-1.5-pentanediol diacrylate (MPDDA)	64194-22-5	2	8.5	120	50	33	Low odour, adhesion, high solvency and cutting power	•••	•••	•	•••	•••	••
Photomer 4226 (LT)	Dipropyleneglycol diacrylate (DPGDA)	57472-68-1	2	10	60	96	33	Pigment wetting, high reactivity, high solvency and cutting power	••	••	•	••	••	•
Photomer 4335	Pentaerythritol tri and tetraacrylate (PETIA)	1245638-61-2	3.5	650	100	100		High reactivity, low viscosity	•••		•	••	•••	•

METHACRYLATES

Chemical Identity		Cas No.	Functionality	Typical Viscosity | mPa.s at 25 °C	Colour | APHA max	Acid Value | mg koh/g max	Tg | °C	Surface Tension 25°C | m n/m	Product Attributes	Reactivity	Hardness	Flexibility	Adhesion
Photomer 2006	Trimethylolpropane trimethacrylate (TMPTMA)	3290-92-4	3	43	70	0.1	27	32	Chemical and impact resistance, hardness	•••	••	•	•••
PureOmer 2012	Isobornyl methacrylate (IBOMA)	7534-94-3	1	6	50	0.5	150	31	Adhesion, flexibility, low shrinkage, abrasion resistance, high Tg (150) Bio-based Content (ASTM D6866-21) : 72 %	•	•	••	•••

Products are subject to availability per region

INHIBITOR

	Chemical Identity	Cas No.	Melting Point | °C	Appearance	Product Attributes
Omnistab IN 515	Liquid blend of tris(N-hydroxy-N-nitrosophenyl-aminato-O,O'alumium and 2-phenoxy ethyl acrylate	15305-07-4 + 48145-04-6	Liquid at room temperature	Medium to dark brown liquid	Polymerisation inhibitor and in can stabiliser for increased shelf life of UV/EB formulations
Omnistab IN 516	Liquid blend of tris(N-hydroxy-N-nitrosophenyl-aminato-O,O'alumium and 2-phenoxy ethyl acrylate	15305-07-4 + 48145-04-6	Liquid at room temperature	Medium to dark brown liquid	Polymerisation inhibitor and in can stabiliser for increased shelf life of UV/EB formulations
Omnistab IN 518	Liquid blend of tris(N-hydroxy-N-nitrosophenyl-aminato-O,O'alumium and propoxylated glycerol triacrylate	15305-07-4 + 52408-84-1	Liquid at room temperature	Medium to dark brown liquid	Polymerisation inhibitor and in can stabiliser for increased shelf life of UV/EB formulations

OMNIVADD 2000 RANGE - SILICONE-FREE FOAM CONTROL ADDITIVES

	Description / Application	Incorporation	Dosage | % *	Solvent borne	Waterborne	UV
Omnivadd WD 2720	Unsaturated polyester, epoxy and polyurethane systems	Before or after processing	0.1-1.0	•		•

OMNIVADD 3000 - SILICONE-FREE SLIP & LEVELLING ADDITIVES

	Description / Application	Incorporation	Dosage | % *	Active content | %	Solvent borne	Waterborne	UV
Omnivadd VA 3906	Polyethylene wax for anti-blocking and scratch resistance	Depending on system	0.5-2.0	100	•	•	

OMNIVADD 4000 - HIGH MOLECULAR WEIGHT DISPERSANTS BASED ON POLYURETHANE CHEMISTRY

	Description / Application	Inorganics % ofOA	Inorganics % of BET	Blacks % of DBP	Active content | %	Solvent borne	Waterborne	UV
Omnivadd XP 4010	General-use industrial coatings including coil coatings and decorative finishes	5-10	20-40	25-30	50	•		

Products are subject to availability per region

OMNIVADD 5000 - RANGE LOW MOLECULAR WEIGHT DISPERSANTS

	Description / Application	Dosage based on inorganics pigments | %	Dosage based on Organics pigments | %	Dosage based on Bentonite | %	Active content %	Solvent borne	Waterborne	UV
Omnivadd SP 5044	Solvent borne or solvent-free coating systems. Also for bentonite gels	0.2-2.0	2.0-5.0	30-50	52	•		
Omnivadd SP 5217	Solvent borne, solventless coatings and printing inks. Excellent for Titanium Dioxide and extenders	0.5-5.0	-	-	100	•		•
Omnivadd SP 5244	Solvent-free version of Omnivadd SP 5044	0.1-1.0	1.0-2.5	15-25	100	•		•

OMNIVADD 6000 - RANGE MODERN LOW MOLECULAR WEIGHT DISPERSANTS

	Description / Application	Dosage based on inorganics pigments | %	Dosage based on Organics pigments | %	Dosage based on Bentonite | %	Active content %	Solvent borne	Waterborne	UV
Omnivadd XP 6212	Acidic polyether, dispersant for solvent-based and solvent-free coatings and composite	5-10	-	-	100	•	•	

Disclaimer:
The information in this overview is presented in good faith and believed to be correct, but is provided on the condition that persons receiving it will make their own assessment on its correctness referring to the latest version of official documentation (e.g. safety data sheet).

Contact information

IGM Resins in the world

Sales and Distribution
Manufacturing
R&D / Tech Support

IGM Resins is a fully integrated global supplier of Energy Curing intermediates. We have the capability to develop energy curing materials, customize them to meet your requirements or increase your productivity, and help you maximize their performance in your application.

Due to regional legislation, some of the products contained in the brochure are not available. Please visit our website or ask availability of the requested product to your commercial contact.

For IGM's global network of officially appointed agents, please visit our website www.igmresins.com

Our technical experience and flexibility to find the right solution for each of our customers – large or small – is a major factor in our industry leadership.

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