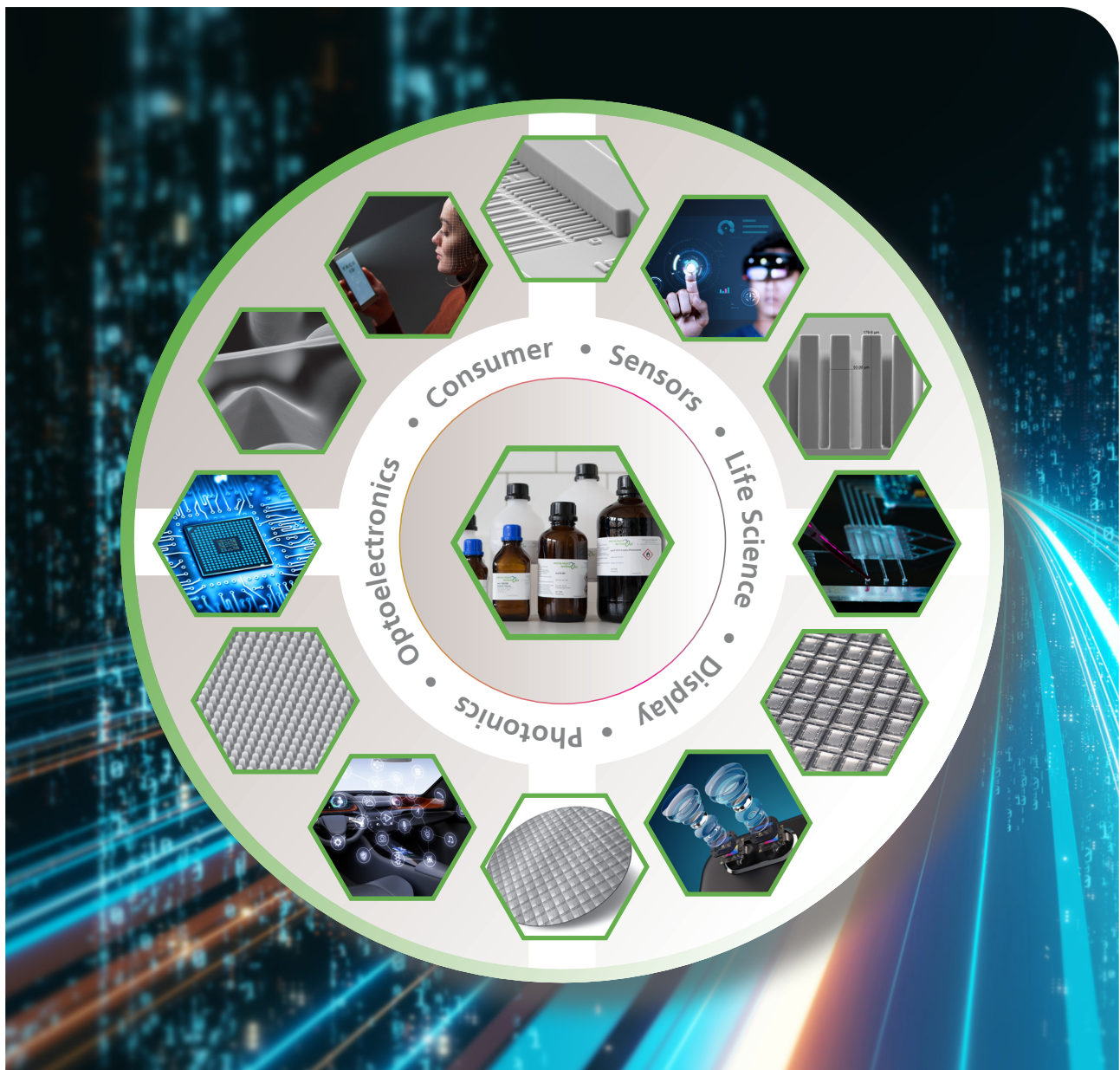


High Performance Material Supplier
for innovative resists, polymers, photopolymers
and ancillaries

micro resist
technology



Product overview

Negative Photoresists

for UV (mask aligner, laser), Deep UV and e-beam lithography

Positive Photoresists

for UV, laser lithography and greyscale patterning

Hybrid Polymers

for micro- and nano-optical applications

Nanoimprint Resists

for thermal and UV-based nanoimprint lithography

Inkjet Materials

functional materials for inkjet-printing

Ancillaries

Photoresists for UV (mask aligner, laser)/ DUV and e-beam lithography

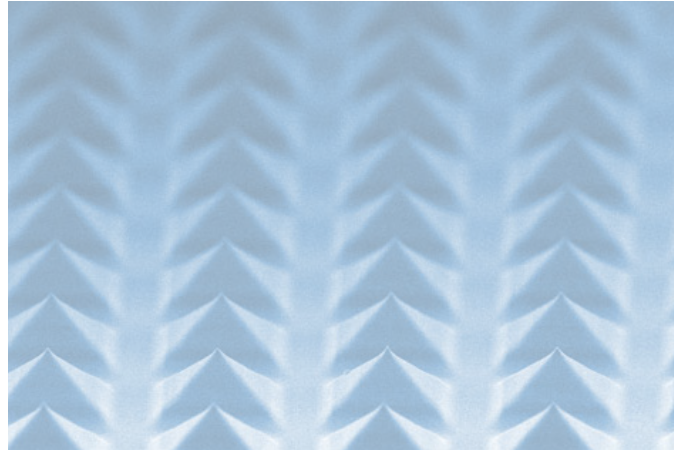
- Effective for broadband, i-line, Deep UV, e-beam exposure, or laser direct writing @ 405 nm
- Lift-off resists with tunable pattern profile, high temperature stability up to 160 °C
- Variety of viscosities for different film thicknesses in one spin-coating step



Product series	Material class	Compatible processes	Preferred applications	Unique features
ma-N 1400	Aromatic bisazide/ novolak, non-Car	UV mask aligner, laser & stepper lithography	Single layer lift off, etch mask, mould for electroplating	aqueous-alkaline development, thermal stability up to 110°C, easy to remove
ma-N 400	Aromatic bisazide/ novolak, non-Car	UV mask aligner, laser & stepper lithography	Single layer lift off, etch mask, mould for electroplating	aqueous-alkaline development, thermal stable up to 160°C, easy to remove
ma-N 2400	Aromatic bisazide/ novolak, non-Car	e-beam, Deep UV lithography	Etch mask	aqueous-alkaline development, robust & easy processing, easy to remove
mr-DWL	Epoxy resin, CAR	UV mask aligner, laser & stepper lithography, 2PP	Mold for electro- plating, master for replication, etch mask	light sensitive up to 410 nm, for pattern transfer processes and permanent applica- tions
EpoCore & EpoClad	Epoxy resin, CAR	UV lithography	Polymer based waveguides, mould for electroplating, master for replication, etch mask	highly transparent to visible light, high thermal stability, for pattern transfer pro- cesses and permanent applications
mr-EBL 6000	Epoxy resin, CAR	e-beam, UV lithography	Etch mask	for pattern transfer processes and perma- nent applications

Positive Photoresists for UV lithography (mask aligner, laser, greyscale exposure)

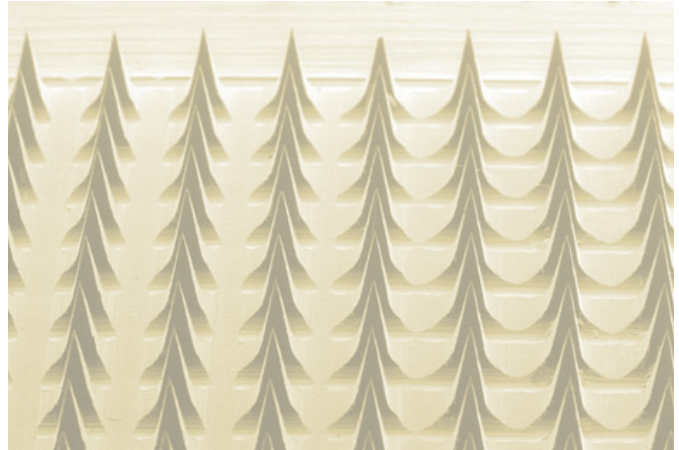
- Variety of viscosities for 0.1 µm – 60 µm film thickness in one spin-coating step
- Effective for broadband, g-line, h-line or i-line exposure and laser direct writing at 350...450 nm
- No post exposure bake
- Easy removal



Product series	Material class	Compatible processes	Preferred applications	Unique features
ma-P 1200G	DNQ/ novolak	Greyscale lithography, UV lithography, Laser interference lithography	UV moulding, Electroplating, Dry etching • 2.5D structures in micro-optics, MEMS and MOEMS, wafer-level optics, micro-fluidics	1-60 µm film thickness by spin-coating, Aqueous-alkaline development, Easy to remove, For pattern transfer
ma-1200	DNQ/ novolak	UV lithography	Dry etching, Ion implantation, Electroplating, Pattern reflow + UV moulding • LEDs, microsystems, semiconductor components, microoptics	0.3-40 µm film thickness by spin-coating, Aqueous-alkaline development, Easy to remove, For pattern transfer
ma-P1275HV	DNQ/ novolak	UV lithography	Electroplating, Dry etching, Ion implantation, Pattern reflow + UV moulding • microsystems, micro-optics	10-50 µm film thickness by spin-coating, Aqueous-alkaline development, Easy to remove, For pattern transfer
mr-P 1200 LIL	DNQ/ novolak	Laser interference lithography, UV lithography	Dry etching, electroplating • Laminar grids, VSL grids	0.1-0.5 µm film thickness by spin-coating, Aqueous-alkaline development, Easy to remove, For pattern transfer

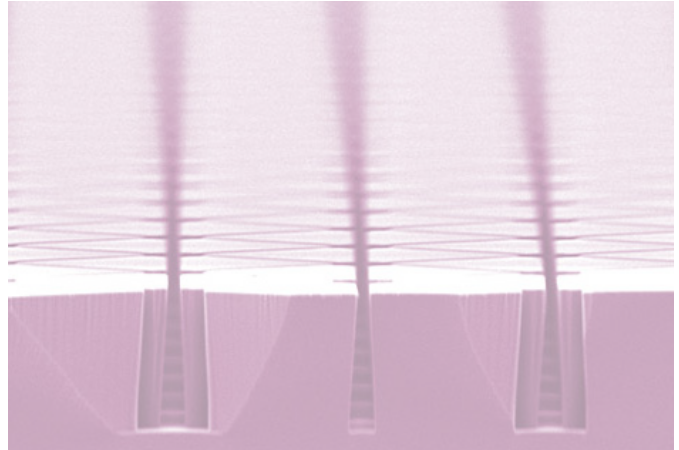
UV-curable Hybrid Polymers for micro-optical applications.

- Excellent transparency
- Excellent mechanical properties
- High chemical and physical stability
- Excellent replication fidelity
- Ready-to-use solutions



Product series	Material class	Compatible processes	Preferred applications	Unique features
OrmoComp®	Si-containing acrylate-functionalized pre-cursor polymer	UV Molding, UV Lithography, 2PP, 3D printing	Micro- and nano-optical devices (e.g. micro lenses, DOE, gratings)	very high temperature and climate stability, PDMS compatibility
OrmoStamp®	Si-containing acrylate-functionalized pre-cursor polymer	UV Molding	Working stamp fabrication	Intrinsic release properties, excellent pattern fidelity down to sub-100nm features
OrmoClear®FX	Si-containing acrylate-functionalized pre-cursor polymer	UV Molding, UV Lithography, 2PP	Micro- and nanooptical devices (e.g. micro lenses, DOE, gratings), micro fluidics	high temperature and climate stability, PDMS compatibility
OrmoClear® series	Si-containing acrylate-functionalized pre-cursor polymer	UV Molding, UV Lithography, 2PP	Micro-optical devices (e.g. micro lenses, DOE, gratings)	Low volume shrinkage
OrmoCore and OrmoClad	Si-containing acrylate-functionalized pre-cursor polymer	UV Molding, UV Lithography	Wave guides, beam splitter, optical inter connectors	Low optical loss, no birefringence

Nanoimprint Lithography (NIL) is a straight forward, low cost, and high throughput capable technology for the fabrication of nanometer scaled patterns. Main application fields are photonics, next generation electronics, as well as bio- and sensor applications.

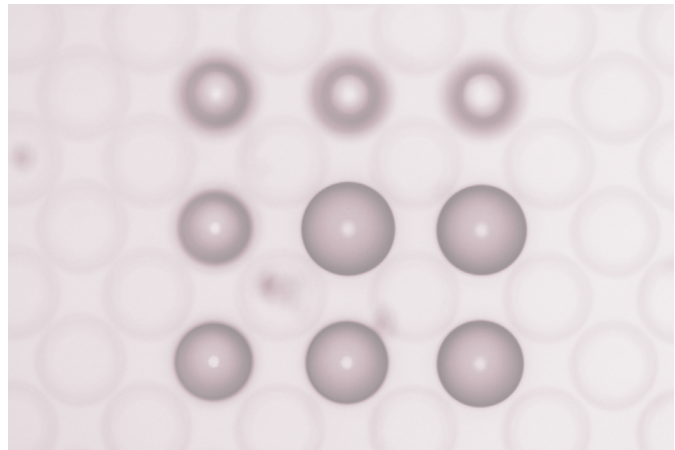


Product series	Material class	Compatible processes	Preferred applications	Unique features
mr-NIL200 series	Acrylate monomer formulation	UV-NIL	Dry etch mask for pattern transfer by plasma etching, for gas impermeable working stamps	UV-crosslinking, purely organic, no primer needed, low viscosity, insensitive versus oxygen
mr-NIL210 series	Acrylate monomer formulation	soft UV-NIL	Dry etch mask, for gas permeable working stamps	UV-crosslinking, purely organic
mr-NIL212FC series	Acrylate monomer formulation	soft UV-NIL	Dry etch mask, for gas permeable working stamps	UV-crosslinking, fast curing, compatible to low exposure dose in the presence of oxygen
mr-UVCur26SF	Acrylate monomer formulation	R2R UV-NIL, S&R UV-NIL	Dry etch mask, permanent optical applications, for gas impermeable working stamps	Very low viscosity, solvent-free
mr-XNIL26SF	Acrylate monomer formulation	UV-NIL	Dry etch mask, for gas impermeable working stamps	UV-crosslinking, purely organic, high content of fluorinated compounds

Product series	Material class	Compatible processes	Preferred applications	Unique features
mr-I T85 series	Cycloolefin-Copolymer, thermoplastic polymer formulation	T-NIL	optical devices, micro fluidics, lab-on-a-chip	Purely organic, very non-polar, insoluble in acids and alkaline solutions, T_g 85°C
mr-I 7000R series	Thermoplastic polymer formulation	T-NIL	Dry etch mask	Purely organic, T_g = 60 °C
mr-I 8000R series	Thermoplastic polymer formulation	T-NIL	Dry etch mask	Purely organic, T_g = 115 °C
mr-I 9000M series	Thermoset polymer formulation	T-NIL	Dry etch mask	Purely organic, T_g = 35 °C, thermal curing, no T_g after imprint
mr-NIL 6000E series	Epoxy oligomer formulation	thermal assisted UV-NIL	Dry etch mask	Purely organic, T_g = 1 °C
SIPOL series	Thermoplastic polymer formulation	T-NIL	Dry etch mask, 2-layer system with UL1 for deep trenches etching	Si-containing, T_g = 63 °C
mr-I PMMA35k series	Thermoplastic polymer formulation	T-NIL	Rudimental NIL investigations	Purely organic, T_g = 105 °C

Functional materials for inkjet-printing

- Available in different viscosities (adjustable)
- Suitable in commercial inkjet printing devices
- Focused on high reliability of droplet generation
- UV-curable formulations



Product series	Material class	Compatible processes	Preferred applications	Unique features
InkEpo	Epoxy resin based, CAR	Inkjet Printing	Protecting layer, micro lenses & micro lens array, spacer, glue	solvent containing, UV curable, excellent thermal, mechanical and chemical stability, optically transparent
InkOrmo	Si-containing acrylate-functionalized precursor polymer	Inkjet Printing	micro-lenses, waveguides, microfluidics	UV-cureable, excellent thermal, mechanical and chemical stability of cured patterns
mr-UVCur26SF	Acrylate monomer formulation	Inkjet Printing, step & repeat NIL process, R2R UV-NIL	large area permanent nano structuring	solvent-free, organic, photo-curable nano-imprint resist for inkjet dispensing

Overview Ancillaries

- Thinner
- Primer
- Developer
- Remover
- Protection and transfer layers
- Etching solutions



Product	Material class	Compatible processes/ product series	Preferred applications/ comments
Thinner			
ma-T 1045	Solvent based	mr-NIL 6000E, mr-I 9000M	NIL resists
ma-T 1046	Solvent based	ma-N 1400	-
ma-T 1050	Solvent based	ma-P 1200(HV), ma-P 1200 G, ma-P 1200LIL, Hybrid polymers, mr-I 7000, mr-I 8000, mr-NIL26SF, mr-NIL212FC	Positive and NIL resists, hybrid polymers for FT ¹ < 500 nm
mr-T 1049	Solvent based	ma-N 400	-
mr-T 1075	Solvent based	mr-NIL210, FT ¹ >500nm	NIL resists
mr-T 1078	Solvent based	mr-NIL210, mr-NIL200, film thickness <500nm	NIL resists
mr-T 1090	Solvent based	ma-N 2400	-
OrmoThin	Solvent based	Hybrid polymers for FT ¹ > 500 nm	Hybrid polymers for FT ¹ > 500nm
Primer			
HMDS-Primer	HMDS based	ma-N 400, ma-N 1400, ma-P 1200G, ma-P 1200(HV), ma-P 1200LIL	Si, SiO ₂ and glass substrates
mr-Primer 80/20	HMDS based	ma-N 2400, ma-N 400, ma-N 1400 ma-P 1200(HV)	Si, SiO ₂ and glass substrates

¹ FT = film thickness

Product	Material class	Compatible processes/ product series	Preferred applications/ comments
SurPass 3000	Aqueous	Epoxy resists - SU-8, EpoCore, EpoClad and mr-DWL	Various substrates
SurPass 4000	Aqueous	ma-N 2400, ma-N 400, ma-N 1400, ma-P 1200G, ma-P 1200(HV), ma-P 1200LIL	Various substrates
OrmoPrime®08	Si-containing adhesion promoter	OrmoClear®FX, OrmoClear®, OrmoComp®, OrmoCore & OrmoClad, OrmoStamp®	Various substrates e.g. Si, glass, quartz, ~ 130nm FT ¹ by spin coating
OrmoPrime®20	Si-containing adhesion promoter	OrmoClear®FX, OrmoClear®, OrmoComp®, OrmoCore & OrmoClad, OrmoStamp®	Various substrates e.g. Si, glass, quartz, FT ¹ < 20nm by spin coating or deposition from the gas phase
mr-APS1	Si-containing adhesion promoter	mr-NIL210, mr-NIL212FC, mr-UVCur26SF mr-XNIL26SF	Forms covalent bonds to oxidic surfaces and acrylate based coatings, FT ¹ (spin-coating) < 10nm
Developer			
ma-D 331	Aqueous-alkaline, NaOH based	ma-P 1200(HV), ma-P 1200G in binary UV lithography, thin layers of ma-N 2400	-
ma-D 331/S	Aqueous-alkaline, NaOH based	ma-P 1200(HV), ma-P 1200G in binary UV lithography, thin layers of ma-N 400	Surfactant containing
ma-D 332	Aqueous-alkaline, NaOH based	thicker layers of ma-N 2400	-
ma-D 332/S	Aqueous-alkaline, NaOH based	thicker layers of ma-N 400	Surfactant containing
ma-D 374/S	Aqueous-alkaline, sodium metasilicate based	ma-P 1200LIL	Surfactant containing
ma-D 377	Aqueous-alkaline, sodium metasilicate based	ma-N 2400, ma-N 400, ma-P 1200(HV)	on sensitive, e.g. Al containing substrates
ma-D 525	Aqueous-alkaline, TMAH based	ma-N 2400	-
ma-D 530/S	Aqueous-alkaline, TMAH based	thin layers of ma-N 400	Surfactant containing

¹ FT = film thickness

Product	Material class	Compatible processes/ product series	Preferred applications/ comments
ma-D 531/S	Aqueous-alkaline, TMAH based	thin layers of ma-N 400	Surfactant containing
ma-D 532/S	Aqueous-alkaline, TMAH based	ma-P 1200G greyscale lithography for $\geq 15\mu\text{m}$ FT ¹ , thicker layers of ma-N 400	Surfactant containing
ma-D 533/S	Aqueous-alkaline, TMAH based	ma-N 1400	Surfactant containing
mr-D 526/S	Aqueous-alkaline, TMAH based	ma-P 1200G gray scale lithography for $< 15\mu\text{m}$ FT ¹ , ma-P 1200(HV)	Surfactant containing
mr-D 4000/75	Aqueous-alkaline, K ₂ CO ₃ based	DuPont MX5000 dry film resists	Spray development
ma-D 4000/100	Aqueous-alkaline, K ₂ CO ₃ based	DuPont WBR2000 dry film resists	Spray development
mr-Dev 600	Solvent based	EpoCore, EpoClad, mr-DWL, mr-UVL 6000, mr-EBL 6000, (all SU-8 resists, DJML SUEx dry film)	-
mr-DevCH	Solvent based	DJML ADEX dry film series	-
OrmoDev	Solvent based	Hybrid polymers	-
Remover			
mr-Rem 500	Solvent based, NMP-free, NEP-containing	ma-N 2400, ma-N 400, ma-N 1400 mr-EBL 6000, mr-DWL, EpoCore, EpoClad, ma-P 1200G, ma-P 1200(HV) ma-P 1200LIL, InkEpo, mr-UVCur265F, SU-8, SU-8 2000, SU-8 3000, SU-8 TF 6000, PMMA/Co-Polymer, LOR / PMGI	-
mr-Rem 700	Solvent based, NMP- & NEP-free, pH ~ 8	ma-N 2400, ma-N 400, ma-N 1400, mr-EBL 6000, mr-DWL, EpoCore, EpoClad, ma-P 1200G, ma-P 1200(HV), ma-P 1200LIL, InkEpo, SU-8, SU-8 2000, SU-8 3000, SU-8 TF 6000, PMMA/Co-Polymer, LOR / PMGI	-
ma-R 404/S	Aqueous ,strongly alkaline, NaOH based	ma-N 2400, ma-N 400, ma-N 1400, ma-P 1200G, ma-P 1200(HV), ma-P 1200LIL	Surfactant containing

¹ FT = film thickness

Product	Material class	Compatible processes/ product series	Preferred applications/ comments
Protection and transfer layers			
UL1 series	Thermoplastic polymer thin film formulation	SIPOL	Organic underlayer / transfer layer for pattern magnification via etching
mr-Conductive Layer	Aqueous polymer solution	ma-N 2400	for patterning by electron beam lithography on non-conductive substrates and for SEM inspection of non-conductive samples
DisCharge H2O	Aqueous polymer solution	PMMA/Co-Polymere	for patterning by electron beam lithography on non-conductive substrates and for SEM inspection of non-conductive samples
mr-PL series	Novolak resin solution	Covering sensible metal patterns or topography	Protection layer
Etching solutions			
Chrome Etch 18	Strongly acidic, aqueous etchant	Etching of Cr layers	-

¹ FT = film thickness