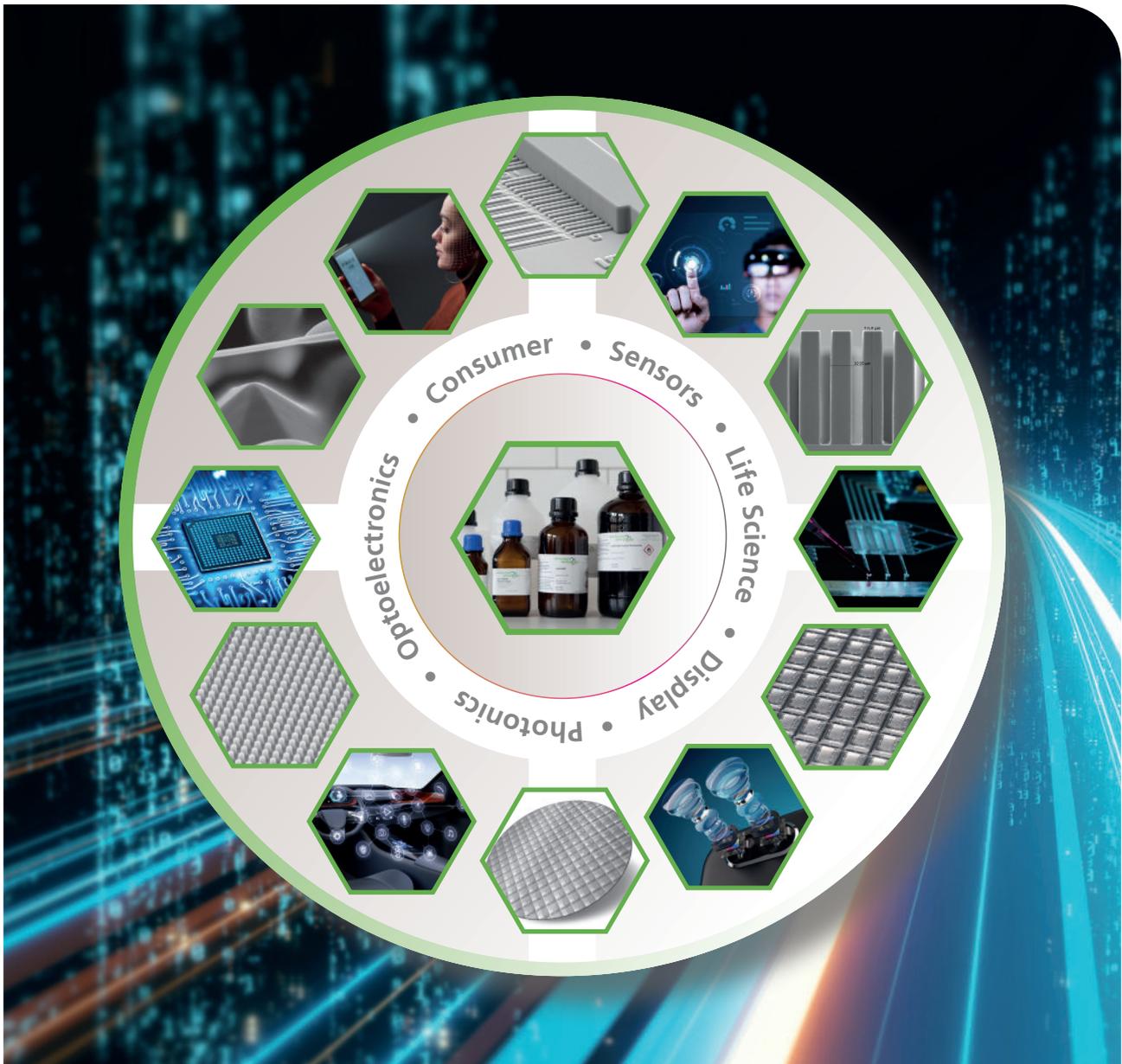


**High Performance Material Supplier**  
for innovative resists, polymers, photopolymers  
and ancillaries



## 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**

# Negative Photoresists

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

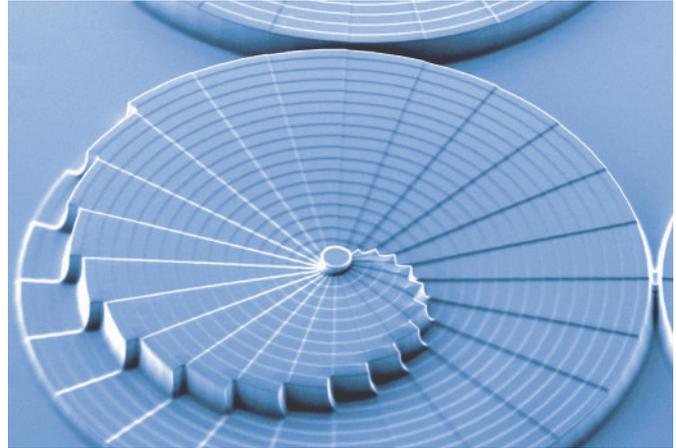
- PFAS free
- Effective for broadband, i-line, Deep UV, e-beam exposure, or laser direct writing
- Lift-off resists with tunable pattern profile, high temperature stability up to 160 °C
- Variety of viscosities for different film thicknesses in one spin-coating step



Product series	Material class	Compatible processes	Preferred applications	Unique features
<b>ma-N 400</b>	Aromatic bisazide/ novolak, non-CAR	UV mask aligner, laser & stepper lithography	Single layer lift off, etch mask, mould for electroplating	0.2 - 10 µm film thick- ness, aqueous-alkaline development, thermal stability up to 110°C, easy to remove
<b>ma-N 1400</b>	Aromatic bisazide/ novolak, non-CAR	UV mask aligner, laser & stepper lithography	Single layer lift off, etch mask, mould for electroplating	0.2 - 6.5 µm film thick- ness, aqueous-alkaline development, thermal stable up to 160°C, easy to remove
<b>ma-N 2400</b>	Aromatic bisazide/ novolak, non-CAR	e-beam, Deep UV lithography	Etch mask	0.05 - 1.8 µm film thickness, aqueous-al- kaline development, robust & easy proces- sing, easy to remove
<b>mr-DWL</b>	Epoxy resin, CAR	UV mask aligner, laser @ 405 nm & stepper lithography, 2PP	Mold for electro- plating, master for replication, etch mask	3 - 150 µm film thick- ness, light sensitive up to 410 nm, for pattern transfer processes and permanent applica- tions
<b>EpoCore &amp; EpoClad</b>	Epoxy resin, CAR	UV lithography	Polymer based waveguides, mould for electroplating, master for replication, etch mask	1.5 - 80 µm film thickness, highly trans- parent to visible light, high thermal stability, for pattern transfer processes and perma- nent applications
<b>mr-EBL 6000</b>	Epoxy resin, CAR	e-beam, UV lithography	Etch mask	0.06 - 0.8 µm film thickness, for pattern transfer processes and permanent applica- tions

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

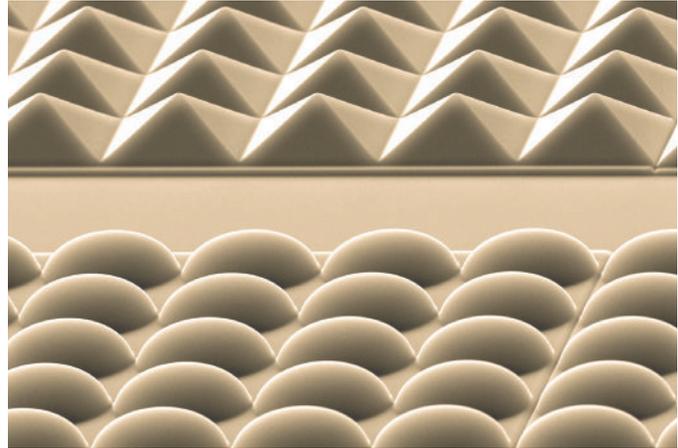
- PFAS free
- Variety of viscosities for 0.1 µm – 140 µm film thickness in one spin-coating step
- Effective for broadband, g-line, h-line or i-line exposure and laser direct writing at 350...450 nm
- No post exposure bake
- Easy removal



Product series	Material class	Compatible processes	Preferred applications	Unique features
<b>ma-P 1200 / ma-P 1275HV</b>	DNQ/ novolak	UV lithography	Dry etching, Ion implantation, Electro-plating, Pattern reflow + UV moulding •LEDs, microsystems, semiconductor components, micro optics	0.3-40 µm film thickness by spin-coating (10-50 µm ma-P 1275HV)), aqueous-alkaline development, for pattern transfer
<b>ma-P 1200G</b>	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, microfluidics	1-60 µm film thickness by spin-coating, aqueous-alkaline development, for pattern transfer
<b>mr-P 22G</b>	DNQ/ novolak	Greyscale lithography for very deep greyscale patterns, UV lithography, Laser interference lithography	Electro-plating, UV moulding •LEDs, microsystems, semiconductor components, micro optics, freeform optics	115-140 µm film thickness by single layer spin-coating (200 µm by double layer coating), aqueous-alkaline development, for pattern transfer
<b>mr-P 1200 LIL</b>	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, for pattern transfer

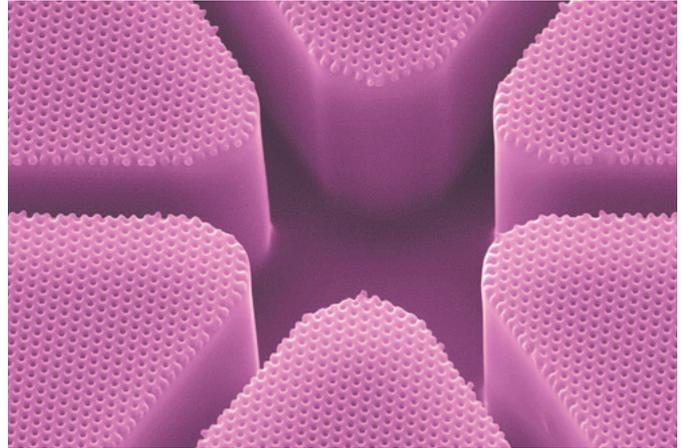
## UV-curable Hybrid Polymers for micro-optical applications.

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



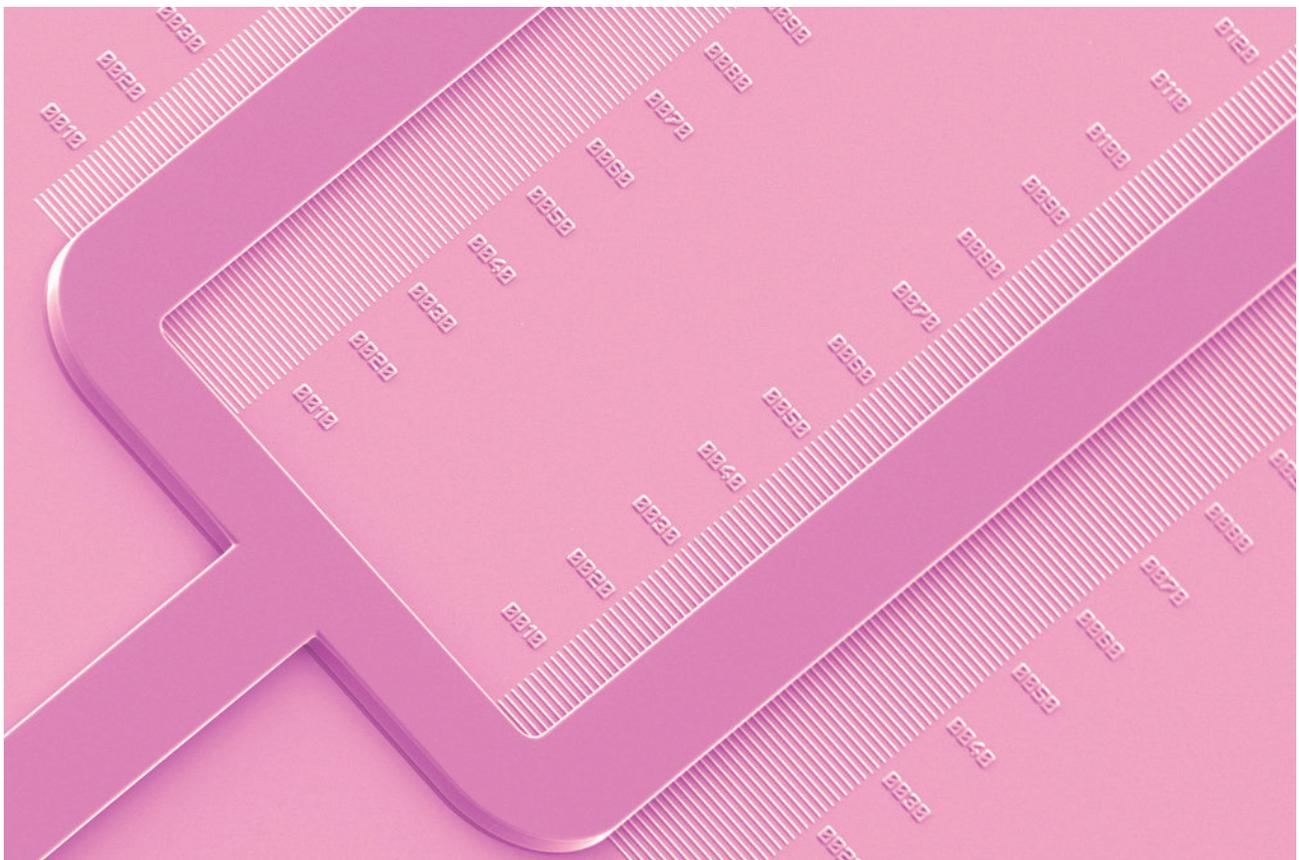
Product series	Material class	Compatible processes	Preferred applications	Unique features
<b>OrmoComp®</b>	Si-containing acrylate-functionalized pre-polymer	UV Molding, UV Lithography, 2PP, 3D printing, 2D & 3D direct laser writing	Micro- and nano-optical devices (e.g. micro lenses, DOE, gratings)	very high temperature and climate stability, PDMS compatibility
<b>OrmoStamp®FF</b>	Si-containing acrylate-functionalized pre-polymer	UV Molding	Working stamp fabrication	Intrinsic release properties, excellent pattern fidelity down to sub-100nm features
<b>OrmoClear®FX</b>	Si-containing methacrylate-functionalized prepolymer	UV Molding, UV Lithography, 2D & 3D direct laser writing	Micro- and nanooptical devices (e.g. micro lenses, DOE, gratings), micro fluidics	high temperature and climate stability, PDMS compatibility
<b>OrmoClear® series</b>	Si-containing methacrylate-functionalized prepolymer	UV Molding, UV Lithography, 2PP	Micro-optical devices (e.g. micro lenses, DOE, gratings)	Low volume shrinkage
<b>OrmoCore and OrmoClad</b>	Si-containing acrylate-functionalized precursor polymer	UV Molding, UV Lithography, 2D & 3D direct laser writing	Wave guides, beam splitter, optical inter connects	Low optical loss @ 1310 and 1540 nm, 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.**



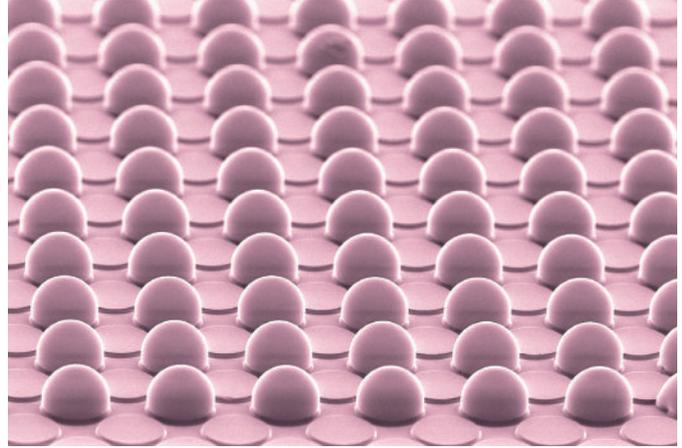
Product series	Material class	Compatible processes	Preferred applications	Unique features
<b>mr-NIL200 series</b>	Acrylate monomer formulation	UV-NIL	Dry etch mask for pattern transfer by plasma etching, for gas impermeable working stamps	UV-crosslinking, purely organic, no primer needed, low viscosity, insensitive versus oxygen
<b>mr-NIL210 series</b>	Acrylate monomer formulation	soft UV-NIL	Dry etch mask, for gas permeable working stamps	UV-crosslinking, purely organic
<b>mr-NIL212FC series</b>	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
<b>mr-UVCur26SF</b>	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
<b>mr-XNIL26SF</b>	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
<b>mr-I T85 series</b>	Cycloolefin-Copolymer, thermoplastic polymer formulation	T-NIL	optical devices, microfluidics, lab-on-a-chip	Purely organic, very non-polar, insoluble in acids and alkaline solutions, $T_g$ 85°C
<b>mr-I 7000R series</b>	Thermoplastic polymer formulation	T-NIL	Dry etch mask	Purely organic, $T_g$ = 60 °C
<b>mr-I 8000R series</b>	Thermoplastic polymer formulation	T-NIL	Dry etch mask	Purely organic, $T_g$ = 115 °C
<b>mr-I 9000M series</b>	Thermoset polymer formulation	T-NIL	Dry etch mask	Purely organic, $T_g$ = 35 °C, thermal curing, no $T_g$ after imprint
<b>mr-NIL 6000E series</b>	Epoxy oligomer formulation	thermal assisted UV-NIL	Dry etch mask	Purely organic, $T_g$ = 1 °C
<b>SIPOL series</b>	Thermoplastic polymer formulation	T-NIL	Dry etch mask, 2-layer system with UL1 for deep trenches etching	Si-containing, $T_g$ = 63 °C
<b>mr-I PMMA35k series</b>	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
<b>InkEpo</b>	Epoxy resin, CAR	Inkjet Printing	Protecting layer, micro lenses & micro lens array, spacer, glue	Solvent containing, UV curable, excellent thermal, mechanical and chemical stability of cured pattern, optically transparent
<b>InkOrmo</b>	Si-containing acrylate-functionalized pre polymer	Inkjet Printing	micro-lenses, waveguides, microfluidics	UV-curable, excellent thermal, mechanical and chemical stability of cured patterns

## Overview Ancillaries

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



Product	Material class	Compatible processes/ product series	Preferred applications/ comments
<b>Thinner</b>			
ma-T 1045	Solvent based	mr-EBL 6000, mr-UVL 6000 mr-NIL 6000E, mr-I 9000M	-
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 <sup>1</sup> < 500 nm
mr-T 1049	Solvent based	ma-N 400	-
mr-T 1075	Solvent based	mr-NIL210, FT <sup>1</sup> >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 <sup>1</sup> > 500 nm	Hybrid polymers for FT <sup>1</sup> > 500nm
<b>Primer</b>			
HMDS-Primer	HMDS based	ma-N 400, ma-N 1400, ma-P 1200G, ma-P 1200(HV), ma-P 1200LIL	Si, SiO <sub>2</sub> and glass substrates
mr-Primer 80/20	HMDS based	ma-N 2400, ma-N 400, ma-N 1400 ma-P 1200(HV)	Si, SiO <sub>2</sub> and glass substrates

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 <sup>1</sup> by spin coating
OrmoPrime®20	Si-containing adhesion promoter	OrmoClear®FX, OrmoClear®, OrmoComp®, OrmoCore & OrmoClad, OrmoStamp®FF	Various substrates e.g. Si, glass, quartz, FT <sup>1</sup> < 20nm by spin coating or deposition from the gas phase
mr-APS1	Si-containing adhesion promoter	mr-NIL210, mr-NIL212FC, mr-UVCur265F mr-XNIL265F	Forms covalent bonds to oxidic surfaces and acrylate based coatings, FT <sup>1</sup> (spin-coating) < 10nm
<b>Developer</b>			
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

<sup>1</sup> 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, $\text{K}_2\text{CO}_3$ based	DuPont MX5000 dry film resists	Spray development
ma-D 4000/100	Aqueous-alkaline, $\text{K}_2\text{CO}_3$ 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 resist film series	-
OrmoDev26	Solvent based	Hybrid polymers	Immersion or spray development
<b>Remover</b>			
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

<sup>1</sup> FT = film thickness

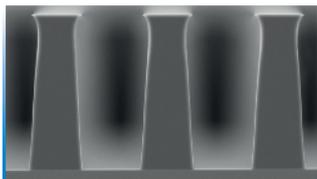
Product	Material class	Compatible processes/ product series	Preferred applications/ comments
<b>Protection and transfer layers</b>			
UL1 series	Thermoplastic polymer thin film formulation	SIPOL	Organic underlayer / transfer layer for pattern magnification via etching
mr-Conductive Layer	Aqueous polymer 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-Polymer	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 in e.g. dicing process
<b>Etching solutions</b>			
Chrome Etch 18	Strongly acidic, aqueous etchant	Etching of Cr layers	for mask manufacturing and thin film Chrom patterning

<sup>1</sup> FT = film thickness

## The contactless way to our brochures and data sheets

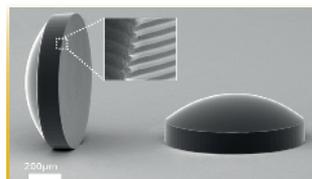
### Materials and Technologies for Micro- and Nanofabrication

#### UV Lithography - Thick Film Processing



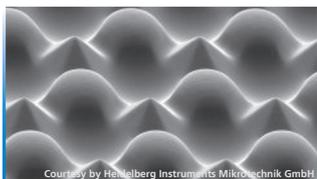
Pattern in 100µm thick positive tone resist  
**ma-P 1200 series**  
**ma-P 1275HV**

#### Micro Optical Components



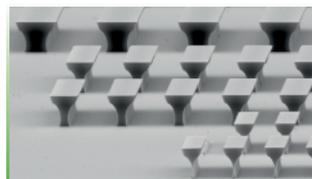
Microlens made of **InkOrmo**, with integrated nano grating by combination of inkjet dispensing and UV replication

#### Greyscale lithography



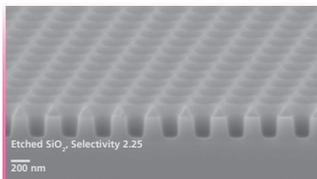
Master generation by laser direct writing in  
**mr-P 1275G**

#### Lift-Off Processing



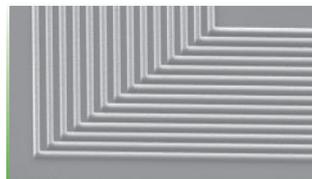
Single layer lift off pattern made by UV lithography in **ma-N 1440**

#### UV nanoimprint lithography



Pillar structure after pattern transfer by RIE into SiO<sub>2</sub> (selectivity 1:2.25) Etch mask made in **mr-NIL212FC** by UV imprinting

#### E-Beam lithography



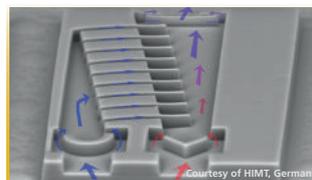
Etch mask 200nm pattern in **ma-N2400** by e-beam lithography

#### Inkjet Printing



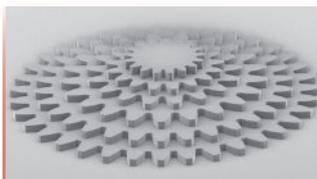
Micro lenses in **InkOrmo** adjustable lens shape by controlling droplet size and number during the inkjet printing

#### 2PP



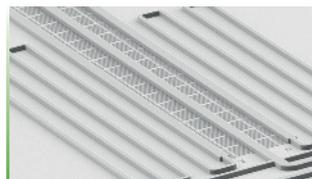
**OrmoComp®/ OrmoClear®FX** pattern for life science application

#### Dry Film - Multi Layer Lithography



Multi layer pattern in **dry films** for complex 3D-architectures

#### UV Lithography - Multi Layer Processing



Pattern in thick negative tone resist  
  
3-layer microfluidic pattern made of SU-8 3000 and modified SU-8

OrmoComp® DE 30 210 075 433; R 1 091 982; TW 10003626; OrmoClear® DE 30 210 075 434; R 1 091 359; TW 10003628; OrmoStamp® DE 30 210 075 435; R 1 092 621; TW 10003629; OrmoPrime DE 30 210 075 436

