Sika – a Global Network

Responsible Care

Certified Quality System SQS Reg. No. 10553-01 ISO 9001/EN 29001 since 1986

Certified Management System SQS ISO 14001 since 1997

Distributor for The Benelux:
SCABRO Ideeën Krijgen Vorm

Scabro
Vliegveld Valkenburg
Wassenaarseweg 75-3265
NL - 2223 LA Katwijk

Tel: +31 (0) 71 4017246
Fax: +31 (0) 84 7402572
Email: info@scabro.com
Internet: www.scabro.com

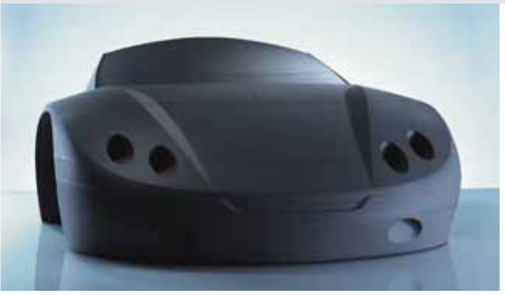
SikaBlock® and Biresin® – Ideas take Shape

- ☐ Block materials and Model pastes
- ☐ Vacuum Casting resins and RIM-systems
- ☐ Composite and Laminating systems
- ☐ EP- and PUR-Casting resins
- ☐ Elastomeric Casting resins
- ☐ Auxiliary materials

SCABRO Ideeën Krijgen Vorm

Ideas take Shape

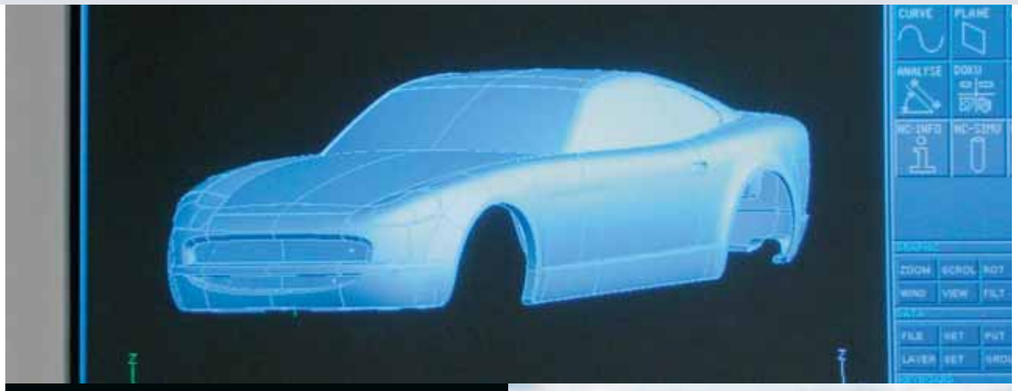
In the almost 100 years since the company was established by Kaspar Winkler in 1910, Sika has developed into a globally operating company for specialist chemicals. More than 10,000 employees all round the world work with our customers to create innovative products and solutions in the areas of construction chemicals and industry. Sika achieves a turnover of CHF 3.5 Billions per year.



As an integral part of this strong association but nevertheless operating independently, the company's Tooling & Composites division develops and produces customized products for pattern and mould construction, foundry systems, rapid production and composite production. All the core functions such as research and development, production, marketing/sales, and technical service, are gathered together at one location – in Bad Urach at the foot of the Schwäbische Alb. Customer requirements can thus be met quickly and efficiently and this is backed up by the possibility of exploiting the know-how of over 600 developers world-wide.

Our customers and their satisfaction are the focal point of our activities. For you, this means:

- Expert on-site consulting provided by our staff
- Training and technical support by a service team composed of experienced model makers and technicians
- A complete range of PUR- and EP-systems for the area of Tooling & Composites.
- World-wide availability of materials through a network of competent trading partners



SikaBlock® and Biresin® – Our Product Groups

Block materials and Model pastes

The suitable system for any application.

- Model and Tooling boards
- Suitable Adhesive and Filler systems
- Model and mould making pastes

A wide range of application-oriented system solutions consisting of special SikaBlock® board materials and the associated Biresin® Adhesives and Fillers can be used for many applications in the construction of master-, design, styling and cubing models as well as for diverse moulds, foundry patterns and other manufacturing tools.

Biresin® Model pastes are tailor-made products for making joint-free design, styling and cubing models and diverse moulds in high quality.

Vacuum Casting resins and RIM-systems

Complicated mouldings quickly made.

- Vacuum Casting systems
- Low pressure RIM-systems

For classic rapid prototyping our Biresin® Vacuum Casting systems based on polyurethane are suitable. They are simulating the majority of characteristics of the thermoplastic series materials.

The same applies for the product group of the Biresin® Low pressure RIM-systems, which are processed with the help of 2-component-mixing and metering machines.
Because of very short demoulding times the LP-RIM-casting is suitable above all for serial production.

Composite and laminating systems

Together they are strong.

- High Performance Composite systems
- Gelcoats
- Laminating and Multipurpose resins

Biresin® Composite resins are specially designed for the production of high performance composites giving good wetting of difficult carbon fibres, variable viscosity for different production processes and application temperature ranges from 80 to 170°C.

Excellent processing and good resistance to external influences are the deciding features of Biresin® gelcoats.

The Biresin® Laminating systems can be used in different stages of manufacture in the construction of models, negatives, moulds and tools.

EP- and PUR-Casting systems

Everything made in one casting.

- Fastcast resins
- EP-Casting resins
- Heat-resistant Casting resins
- PUR- and Backfill-Casting systems

The large range of Biresin® Tooling resins can be used in many different ways. They are suitable for the quick and inexpensive manufacture of production equipment such as foam-, RIM- and vacuumforming moulds or foundry patterns and metal sheet forming tools.

There are also suitable casting resins for making auxiliary items such as master and core models or negatives.

The system selected depends on the casting procedure in question, e.g. mass casting, backfill or facecasting.

Elastomeric Casting resins

Flexible also with regard to possible applications.

- Elastomeric Casting resins for mould making
- Elastomeric Casting resins for foundry pattern making

The range of elastomeric Biresin® PUR-Casting resins includes high-quality synthetic resin systems with a variety of shore hardness levels (Shore A40 – D70) and possible applications.

The soft elastic types are used for making flexible moulds and mouldings.

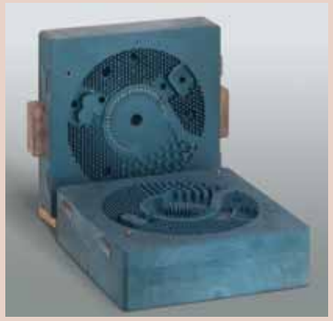
The tough elastic and tough hard types are suitable for shock resistant parts and abrasion resistant liners in foundry pattern making and special mechanical engineering.

Biresin® Model and Tooling boards

Whether design or data control model, whether gauge or core box – SikaBlock® board materials are the optimum products for all applications. There are 12 different board types with densities of 0.08 to 1.2 kg/dm³. They are available in different dimensions and thicknesses of up to 2000 x 1000 x 600 mm.
In accordance with requirements, the materials also differ in respect of their structure, as well as their mechanical and thermal characteristics.
Numerous quality checks help to monitor compliance with these standards.
For us, certification to DIN EN ISO 9001 is a natural expression of our attitude towards quality.

When it comes to development and product updates, we place special value on the following characteristics:

- Physiological harmlessness
- Easy to work material with little wear on tools
- Low levels of dust and smell
- Very small tension levels and therefore low deformation
- Low coefficient of thermal expansion and therefore dimensionally stable
- Homogeneous structure and dense surface quality
- Sufficient strength and heat resistance



SikaBlock® Model boards

SikaBlock®	M80	M160	M300	M450	M550	M610
Density [g/cm³]	0.08	0.16	0.3	0.45	0.7	0.7
Colour	beige	beige	light orange	orange	light brown	reddish brown
Characteristics	easily workable, fine, homogeneous surface, high heat resistance		easily workable, fine structure and homogeneous surface	easily workable, homogeneous surface, low dust formation	easily workable, dense fine surface, very low dust formation	comparable to M550 but harder and with better edge stability
Applications	styling models, design studies and test milling, substructure for design, styling and clay models		design and styling models, substructure for cubing and DCM, test milling	design and styling models, substructure for cubing and DCM	master models, cubing, DCM	similar to M550, in addition mould/ tool construction
Processing data						
Dimensions [mm]; [*ltr.*]	2000 x 1000 x 100 ; *200* 2000 x 1000 x 200 ; *400* blocks up to 600 mm thickness on request		1500 x 500 x 50 ; *37.5* 1500 x 500 x 100 ; *75* 1500 x 500 x 200 ; *150*	1500 x 500 x 50 ; *37.5* 1500 x 500 x 75 ; *56.25* 1500 x 500 x 100 ; *75* 1500 x 500 x 150 ; *112.5* 1500 x 500 x 200 ; *150*	1500 x 500 x 50 ; *37.5* 1500 x 500 x 75 ; *56.25* 1500 x 500 x 100 ; *75*	1500 x 500 x 50 ; *37.5* 1500 x 500 x 75 ; *56.25* 1500 x 500 x 100 ; *75* 1500 x 500 x 150 ; *112.5*
Adhesive **Biresin®** Mixing ratio Potlife Setting time	**Kleber orange** **100 : 65** 20 min 6 h		**Kleber orange** **100 : 65** 20 min 6-8 h		**Kleber braun** **100 : 65** 20 min 8-10 h	
Filler **Biresin®** Mixing ratio Potlife Setting time	**Spachtel orange** **100 : 2** 5 min > 20 min		**Spachtel orange** **100 : 2** 5 min > 20 min		**Spachtel braun** **100 : 2** 5 min > 20 min	
Physical data (approx.-values)						
Shore-hardness	D 6	D 16	D 30	D 50	D 60	D 67
Flexural strength [MPa]	1.2	3.5	5	12	22	26
HDT [°C]	application temperature -80 up to +130°C		78	78	78	95
CTE, α_T [1/K]	70 x 10^{-6}	60 x 10^{-6}	60 x 10^{-6}	55 x 10^{-6}	55 x 10^{-6}	50 x 10^{-6}

SikaBlock® Tooling boards

SikaBlock®	M912	M940	M950	M960	M1000	M1050
Density [g/cm³]	1.1	1.2	1.2	1.2	1.0	1.0
Colour	ivory	green	light green	blue	white	light grey
Characteristics	extremely high abrasion resistance, free from softeners	very abrasion resistant, excellent milling properties, best price/performance ratio	very abrasion resistant, high strength and heat resistance	very abrasion resistant, excellent milling properties, impact resistant	low density, high dimensional stability	
Applications	foundry models, core boxes for series	foundry patterns and core boxes, metal sheet forming tools, mouldings and master models			gauges, moulds, foundry and master models	
Processing data						
Dimensions [mm]; [*ltr.*]	dimensions on request	1000 x 500 x 50 ; *25* 1000 x 500 x 75 ; *37.5* 1000 x 500 x 100 ; *50*			1500 x 500 x 50 ; *37.5* 1500 x 500 x 75 ; *56.25* 1500 x 500 x 100 ; *75*	
Adhesive **Biresin®** Mixing ratio Potlife Setting time	**U1320/U1303** **100 : 38** 10 min ca. 6 h	**Power Adhesive** **100 : 30** 30 min 16 h				
Filler **Biresin®** Mixing ratio Potlife Setting time	-	**Fast Adhesive green** **100 : 60** 3 min 1 h		**Fast Adhesive blue** **100 : 60** 3 min 1 h	**Spachtel weiß** **100 : 2** 5 min > 20 min	recommendation: Polyesterspachtel Supermetall (Hohnen & Co.)
Physical data (approx.-values)						
Shore-hardness	D 68	D 80	D 82	D 78	D 75	D 76
Flexural strength [MPa]	29	90	100	80	48	50
HDT [°C]	120	85	105	80	85	90
CTE, α_T [1/K]	155 x 10^{-6}	85 x 10^{-6}	90 x 10^{-6}	85 x 10^{-6}	50-55 x 10^{-6}	50-55 x 10^{-6}

Biresin® Model and mould making pastes

The manufacture of high-quality, completely joint-free design, styling and cubing models as well as moulds is the domain of Biresin® Model pastes.
They are mainly processed on 2-component mixing and metering machines. The cured resin systems are easy to finish to their correct dimensions by mechanical means. The results are joint-free, smooth surfaces with a high level of precision which can then be covered with layers of paint.

Biresin® M72 –
the fastest model paste in the market

- Low inherent stress allows application to largest areas
- Good adhesion on EPS without previous laminate layer
- Milling possible after 8 hours
- Very low dust when milling
- Attractive price

Biresin® M73 –
high heat distortion temperature,
e.g. for wind power blades

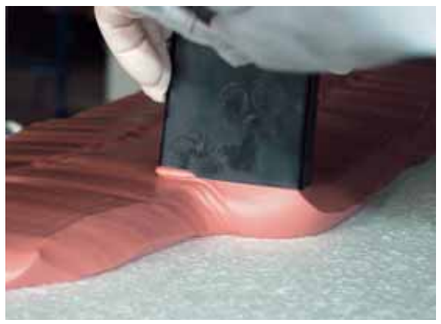
- Tg value 65°C without postcuring
- Heat resistance even without post-curing on the equivalent to postcured epoxy pastes – this saves time and money
- Excellent milling behaviour: very fine and dense surface
- Requires heat resistant substructures

Biresin® M75 –
the mould making paste

- Very fine and dense surface
- Very good resistance against chemical attack (such as polyester)
- In practice more than 80° C heat resistance
- No postcuring of the mould required

Biresin® Model and mould making pastes

Biresin®		M60			M72	M73	M75
	B	M60	S10	F4	M70	M70	M70
Mixing ratio [g]	A	100			100	100	100
	B	30	15	12.5	45	56	48
Colour		brown			brown	brown	grey
Characteristics		high edge stability, easily workable, low shrinkage			easily workable, fine, dense surface, easy to varnish	easy workable, fine dense surface, high thermal resistance, for heat resistant substructures	high thermal resistance, easy workable, very fine and dense surface
Applications		hand applicable EP-paste, with F4 also castable, with S10 as adhesive			machine PUR-paste coating on stock for production of design, styling and cubing models		machine paste coating on stock for production of models and laminating moulds
Processing data							
Viscosity [mPas]	A	pasty			8,000	18,000	9,000
	B	pasty	4,000	< 10	175	175	175
Mixture		pasty	pasty	castable	pasty	pasty	pasty
Potlife [min]		30	15	20	10 (after coating)		15
Workable after [h]		> 16	> 12	> 16	> 8	> 8	> 8
Filler Biresin®		Spachtel braun					
Mixing ratio		100 : 2					
Potlife		5 min					
Setting time		> 20 min					
Physical data (approx.-values)							
Density [g/cm³]		0.77	0.7	0.75	0.9	0.9	1.3
Shore-hardness		D 65	D 69	D 67	D 68	D 70	D 71
Flexural strength [MPa]		25	32	28	24	32	61



Biresin® Vacuum Casting systems

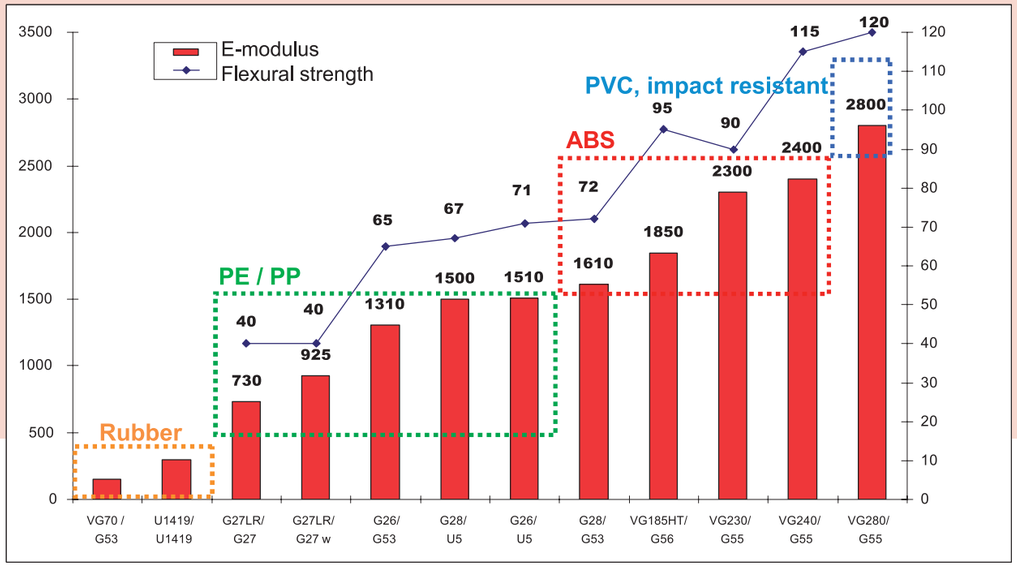
Application:

- Fast and cost-effective production of high-quality prototypes and short run parts
- Simulation of materials as used in serial production (like rubber, soft-PVC, polyethylene, polypropylene, ABS, PVC and others) in stage of development and preproduction for automotive industry, consumer goods and other technical parts
- Processing by easy hand casting or by means of vacuum casting equipment

Range of application:

- Modular assembly system with universal hardeners offers a wide range of E-moduli and further characteristics
- Biresin® VG70 and Biresin® U1419: Flexible systems with good elongation characteristics
- The fast setting fastcast resins with special hardeners present high-quality materials with an excellent price-performance ratio in this E-modulus area of PE, PP and ABS
- Biresin® VG185 HT in use for impact resistant ABS-housings of high heat resistance
- Biresin® VG230 and Biresin® VG280 excel by higher stiffness and strength at simultaneously high impact resistance. Adding of Biresin® G48 resin extends the potlife

Biresin® Vacuum Casting systems



Biresin® Vacuum Casting systems

Biresin®		VG 70		U1419	G27 LR		G26		G28		VG 185 HT	VG 230	VG 240	VG 280
	B	G53		U1419	G27	G27 weiß	G53	U5	U5	G53	G56	G55	G55	G55
Mixing ratio [g]	A	**100**		**100**	**100**		**100**		**100**		**80**	**90**	**57**	**80**
	B	**18**		**16**	**100**	**100**	**75**	**67**	**67**	**75**	**100**	**100**	**100**	**100**
Colour		black		yellowish-transparent	beige	white	beige		beige		black	yellowish-translucent	yellowish-translucent	yellowish-translucent
Characteristics		flexible, simulates rubber, soft-PVC		high tear strength, high rebound elasticity, simulates PE, PP	impact resistant, simulates PE, PP		heat resistant, simulates PE, PP		heat resistant, simulates PE, PP, ABS		impact resistant, high heat distortion tempera-ture, simulates ABS	stiff, very impact resistant, simulates ABS	stiff, very impact resistant and high flexural strength	very stiff, high flexural strength, impact resist., simulates ABS, PVC
Applications		sealing, bellows etc.		tough-hard mouldings	thinwalled parts with complex structure		thinwalled parts of good heat resistance		thinwalled parts of good heat resistance		impact and high heat resistant housings, thinwalled parts with complex structure	very impact resistant housings, covers and other mouldings	very impact resistant housings	very stiff housings and covers of high strength and impact resistance
Processing data (approx.-values)														
Mix. viscosity	[mPas]	900		2,700	50	30	120	110	120	150	1,500	900	950	600
Potlife	[min]	6		6-7	4-5	4-5	2	1´40´´	4	5	6-7	4	8	4
Demoulding time	[min]	45-60*		> 60*	60-90	60-90	> 20	> 20	60-90	60-90	> 45*	60*	60*	60-90*
Physical data (approx.-values)														
Density	[g/cm³]	1.1		1.1	1.1		1.1		1.1		1.2	1.1	1.2	1.1
Shore-hardness		A 70		A 100 (D 54)	D 70	D 70	D 75	D 77	D 79	D 79	D 83	D 82	D 83	D 84
E-modulus	[MPa]	-		-	730	925	1,310	1,510	1,500	1,610	1,850	2,300	2,400	2,800
Tear strength	[N/mm]	9		68	-	-	-	-	-	-	-	-	-	-
Flexural strength	[MPa]	-		-	40	40	65	71	67	72	95	90	115	120
Elongation at break	[%]	200		375	-	-	-	-	-	-	-	-	-	-
Impact strength	[kJ/m²]	-		-	40	70	30	25	25	25	50	> 100	> 100	> 100
HDT	[°C]	-		-	75	70	95*	105*	102*	95*	120*	70	90*	80

* after appropriate thermal treatment (refer to Technical Data Sheet)

Biresin® Low pressure RIM-systems

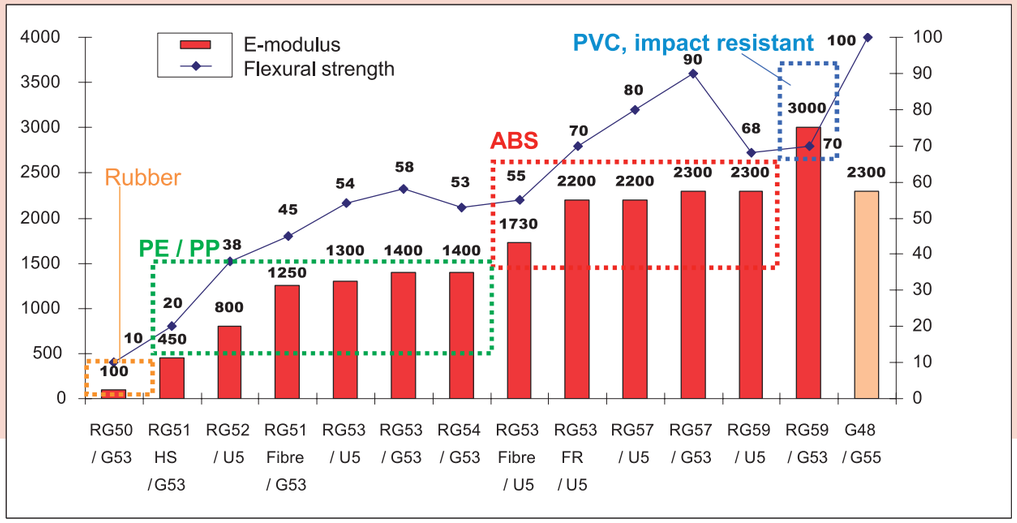
Application:

- Curing PUR resins for use on 2-component mixing and metering machines for the manufacture of individual parts or series manufacture of several thousand pieces
- Simulation of materials of serial production (like rubber, polyethylene, polypropylene, ABS, PVC, and others) in stage of development and preproduction for automotive industry, for household appliances, for rail vehicles, in aviation, in boat building and for other technical parts
- For small parts (< 0.1 ltr.) to big volume parts (appr. 20 ltr.)

Range of application:

- Unit assembly system with only two general-purpose hardeners:
  Biresin® U5 – hardener for higher temperature resistance
  Biresin® G53 – hardener for higher mechanical properties
- Biresin® RG53 and Biresin® RG57 can be mixed, if in between situated E-modulus required
- Biresin® G48 (resin component) – component to increase potlife, with simultaneously increased mechanical properties
- Natural (colourable) and coloured resins
- Biresin® RG51 Fibre and Biresin® RG53 Fibre as fibre filled products with very high impact resistance and stiffness for special applications, e. g. in automotive industry

Biresin® Low Pressure RIM-Systems



Biresin® Low pressure RIM-systems

Biresin®			RG50	RG51 HS	RG52	RG51 Fibre	RG53		RG54		RG53 Fibre	RG53 FR	RG57		RG59	
		B	G53	G53	G53	G53	U5	G53	U5		U5	U5	U5	G53	U5	G53
Mixing ratio	[g]	A	**100**	**100**	**100**	**100**	**100**		**100**		**100**	**100**	**100**		**100**	
		B	**18**	**50**	**64**	**40**	**75**	**80**	**70**		**60**	**54**	**80**	**90**	**28**	**30**
	[ltr.]	B	**15**	**43**	**56**	**40**	**62**	**66**	**60**		**58**	**52**	**68**	**78**	**45**	**48**
Colour			black	black / beige	black	black	black / beige		black		black	black	black / beige		black	
Characteristics			very flexible, simulates rubber, soft-PVC	high impact resistant, wear resistant, simulates PE, PP	high impact resistant, abrasion resistant, simulates PE, PP	very impact resistant, thermal resistant, simulates PE, PP	very impact resistant, thermal resistant, simulates PE, PP		very impact resistant, thermal resistant, simulates PE, PP		very impact resistant, thermal resistant, simulates ABS	flame-resistant (UL-test) thermal resistant, simulates ABS	stiff, high flexural and impact strength, thermal resistant, simulates ABS		very stiff, sound-absorbing, simulates ABS, PVC	
Applications			sealing, bellows etc.	shock-resistant housings and covers	shock-resistant parts such as bumpers	stiff housings and covers	housings and covers of medium stiffness		stiffer housings and covers		stiff housings and covers	stiff housings and covers with UL94 V-0	housings and covers with high mechanical properties		very stiff housings and covers, e.g. for sound absorption	
Processing data (approx.-values)																
Viscosity (Resin)	[mPas]		1,200	1,300	1,800	2,600	2,200		2,600		6,000	3,500	3,100		12,000	
Potlife	[s]		100	60	60	45-50	60		55		50	40	40	50	60	
Demoulding time	[min]		15	> 10	> 10	> 10	> 10		> 10		> 10	> 8	> 10		> 10	
Physical data (approx.-values)																
Density	[g/cm³]		1.1	1.15	1.2	1.25	1.2		1.2		1.2	1.27	1.2		1.8	
Shore-hardness			A 70	D 65	D 75	D 75	D 78	D 80	D 78		D 81	D 84	D 82	D 84	D 83	D 85
E-modulus	[MPa]		-	450	800	1,250	1,300	1,400	1,400		1,730	2,200	2,200	2,300	2,300	3,000
Flexural strength	[MPa]		-	20	38	45	54	58	53*		55	70	80	90	68	70
Impact strength	[kJ/m²]		-	no break	no break	90	95	90	75*		48	35	65	> 100	29	30
Notched-bar impact strength	[kJ/m²]		-	75	42	15	-	-	-		-	-	-	-	-	-
HDT	[°C]		-	62	72	105**	120*	110*	115*		127*	110*	125*	-	65	60

* after appropriate thermal treatment (refer to Technical Data Sheet) ** at 60°C tool temperature

Biresin® High Performance Composite systems

Aimed at part production and mould making applications in the transport, marine, wind energy and other industries, these high performance composite resins are designed to meet the highest standards of production process efficiency and end-use performance.
The resin/hardener systems are specially designed for the three application temperature ranges of 80-100°C, 120°C and 170°C.
For injection processes lower viscosity resins are available and for wet lay up, pultrusion and filament winding there are resins with optimized viscosity. With different hardeners the potlife can be varied.
Suitable gelcoats for mould making and parts production please find on pages 15/16.

Temperature range 80-100°C

- **Biresin® CR80**, very low viscosity injection resin
- **Biresin® CR82**, low viscosity resin for laminates (wet lay up)

With hardeners:
- Biresin® CH80-1 and CH80-2 with potlife of 30 and 60 min for RT curing
- Biresin® CH80-6 and CH80-10 with potlife of 3 and 5 h for curing at slightly elevated temperature

Temperature range 120°C

- **Biresin® CR120**, very low viscosity injection resin

With hardeners:
- Biresin® CH120-3 and CH120-6 with potlife of 90 and 180 min for curing at elevated temperature
- **Biresin® CR122**, low viscosity resin for laminates (wet lay up)

With hardeners:
- Biresin® CH122-3 and CH122-5 with potlife of 90 and 150 min providing the option of RT procuring before demoulding

Temperature range 170°C

- **Biresin® CR170**, low viscosity laminating resin for application and curing at elevated temperature

With hardener:
- Biresin® CH170-3 with potlife of 90 min

Biresin® High Performance Composite systems

Biresin®		A	CR80				CR82					CR120		CR122		CR170
		B	CH80-1	CH80-2	CH80-6	CH80-10	CH80-1	CH80-2	CH80-6	CH80-10		CH120-3	CH120-6	CH122-3	CH122-5	CH170-3
Mixing ratio in pbw	[g]	A	**100**				**100**					**100**		**100**		**100**
		B	**30**				**27**					**30**		**30**		**16**
Characteristics			good impregnation and fast wetting				good impregnation, good non draining properties					good impregnation and fast wetting		good impregnation, good non draining properties		good impregnation and fast wetting
Applications			RTM and infusion				wet lay up					RTM and infusion		wet lay up		wet lay up
Processing data (approx.-values)																
Potlife	[min]		30	60	180	300	30	60	180	300		90	180	90	150	90
Physical data (approx.-values)																
E-modulus	[MPa]		2,600	2,800	2,900	2,900	2,800	2,800	2,900	2,800		2,600	2,500	2,700	2,700	2,750*
Flexural strength	[MPa]		117	120	126	124	120	123	127	118		115	120	128	125	128*
Elongation at break	[%]		7	6	6	6	6	6	6	6		7	8	8	8	7
Impact strength	[kJ/m²]		84	75	68	76	68	70	55	56		55	48	52	59	28*
Tg from HDT-test	[°C]		92	84	83	83	84	78	81	78		115	121	118	120	170*

* after appropriate thermal treatment (refer to Technical Data Sheet)

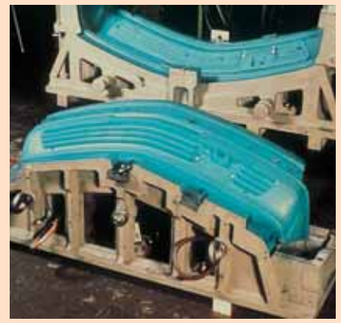
Biresin® Gelcoats and Laminating systems

Gelcoats

Biresin® Gelcoats are very easy to apply and specially formulated. In accordance with their particular application, they have the necessary resistance to external influences such as mechanical, thermal or chemical stress. In other cases, the fact that they are easy to work and colour plays an important role. The gelcoats are used in the construction of models, moulds and tools as well as in composite applications.

Laminating and Multipurpose resins

Biresin® Laminating and Multipurpose resins offer very good wetting behaviour of reinforcing fibres and fillers. The results are high-grade laminates with excellent strength. Their low viscosity allows bonding of large amounts of grainy filling materials for backfill stamping. They are also used for coupling layers. Biresin® Laminating pastes enable time-saving manufacture of reinforcing layers. Here, layers several centimetres thick can be built up in a single stage of work.



Biresin® Laminating and Multipurpose resins

Biresin®		A	LS				L80			L74	L84			L89 Neu
		B	LS	F4	S10	S12	L80	L80 R	S12	L74	L84	S12	L84 T	L89
Mixing ratio	[g]	A	100				100			100	100			100
		B	12	18	22	16	25	25	12	17	25	20	24	14
Colour			yellowish-transparent				white			yellowish-transparent	yellowish-transparent			blue
Characteristics			all-purpose, variable potlife and viscosity				filled, very high dimensional accuracy			high heat resistance after post curing	all-purpose, high mechanical strength and heat resistance			fibre reinforced, high dimensional accuracy, heat resistant
Applications			ordinary laminates, coupling layers and backstampings				true-to-size laminates for gauges and models			injection moulds and other heat resistant moulds	laminating moulds, vacuumforming moulds, heat resist. backstampings			lam. paste for reinforcement of big negatives, models, moulds and tools
Processing data (approx.-values)														
Mix. viscosity	[mPas]		830	350	3,500	1,230	3,400	2,500	2,000	780	390	1,090	590	pasty
Potlife	[min]		55	80	10	60	40	45	70	120-150	40	20	60	60
Demoulding time	[h]		12	16	8	12	20-24	20-24	16-20	24 + post curing	24	24	24 + p. c.	24
Physical data (approx.-values)														
Density	[g/cm³]		1.2				1.3			1.1	1.1			1.0
Shore-hardness			D 83	D 80	D 83	D 82	D 86	D 87	D 85	D 85	D 82	D 84	D 86	D 75
Flexural strength	[MPa]		87	88	108	96	72	76	78	120*	76	130	131*	40
HDT	[°C]		48	46	82*	72*	48	49	80*	160*	100*	91*	110*	60

Biresin® Gelcoats

Biresin®		A	S5		S10		S12		S15		S16	S19
		B	P7	S15	S10		S12		S15	S15 R	S16	S19
Mixing ratio	[g]	A	100		100		100		100		100	100
		B	20	13	10		8		7	10	10	12
Colour			transparent		white	blue	grey		green		blue-grey	grey
Characteristics			good wetting, mechanical resistant		good spreading properties and easily workable		heat resistant		workable, good chemical resistance		high abrasion and mechanical resistance	high heat resistance
Applications			transparent gelcoat for CFRP-mouldings		master models, gauges, negatives		vacuumforming moulds, foundry patterns, moulds for composite production		polyester, foam and LP-RIM-moulds, moulds for composite production		foundry patterns, match plates	vacuumforming moulds, injection moulds, moulds for composite production
Processing data (approx.-values)												
Potlife	[min]		20	37	35		30		60	25	20	45-60
Geltime	[min]		> 30	75	60		45		150	50	45	150-180
Demoulding time	[h]		12-24	24	12-24		16-24		16	16	16	24
Physical data (approx.-values)												
Density	[g/cm³]		1.15		1.5		2.1		1.55		1.8	1.75
Shore-hardness			D 85		D 88		D 92		D 88		D 87	D 85
Flexural strength	[MPa]		103	131	63		78		89	83	95	73
HDT	[°C]		102*	92*	48		> 100*		103*	100*	96*	> 150*

* after appropriate thermal treatment (refer to Technical Data Sheet)

Biresin® Fastcast resins

■ Biresin® Fastcast resins

Biresin® Fastcast resins offer high flowability, a quick curing and this result in quick demoulding. They are easily workable. The wide range of products is characterised by filled and unfilled systems.

■ Filled Biresin® Fastcast resins

Filled Biresin® Fastcast resins are especially suitable for making e.g. master and core models and negatives with large dimensions and are characterized by low shrinkage.

■ Unfilled Biresin® Fastcast resins

The unfilled Biresin® Fastcast resins are usually used for making detailed models and mouldings with thin walls due to their excellent flowability. They can, however, be casted for thicker layers by adding filling materials to them.

Biresin® Fastcast resins – filled

Biresin®		G21	G24	G25
	B	G21	G24	G24
Mixing ratio [g]	A	**100**	**100**	**100**
	B	**15**	**100**	**100**
Colour		light grey / black	blue	green-beige
Characteristics		easily workable, short demoulding time, very fine structure, low shrinkage	easily workable, good flowability, very low shrinkage	
Applications		master and core models, negatives and mouldings of medium size	master and core models, negatives and mouldings of larger dimensions	
Processing data (approx.-values)				
Mix. viscosity [mPas]		2,100	600	700
Potlife [min]		5-6	8	4-5
Demoulding time [min]		30	> 120	30
Physical data (approx.-values)				
Density [g/cm³]		1.7	1.6	1.6
Shore-hardness		D 80	D 80	D 80
Compr. strength [MPa]		75	80	80
HDT [°C]		80	75	85

Biresin® Fastcast resins – unfilled

Biresin®		G26		G27			G27 LV	G27 LR		G28		
	B	G26	G27	G27	G27 w	G55	G26	G27	G27 w	G26	G27	G27 w
Mixing ratio [g]	A	**100**		**100**			**100**	**100**		**100**		
	B	**100**	**100**	**100**	**100**	**80**	**100**	**100**	**100**	**100**	**100**	**100**
Colour		beige		beige	white		beige-grey	beige	white	beige		white
Characteristics		easily workable, short demoulding time, very fine structure, high filler loading						easily workable, longer potlife, low shrinkage, good flowability, high filler loading				
Applications		models, core models, negatives, pattern, small and medium size art and craft articles with detailed shape						models, core models, negatives and pattern articles with medium to large dimensions				
Processing data (approx.-values)												
Mix. viscosity [mPas]		70	80	50	30	140	35	50	30	80	90	60
Potlife [min]		3-4	2-3	2′15″	2′15″	1′30″	2′20″	4-5	4-5	7-8	6-7	6-7
Demoulding time [min]		> 30	> 25	> 20	> 20	> 15	> 15	> 70	> 90	2-3 h	2 h	2-3 h
Physical data (approx.-values)												
Density [g/cm³]		1.1		1.1			1.1	1.1		1.1		
Shore-hardness		D 70	D 70	D 70	D 70	D 75	D 70	D 70		D 68	D 69	D 68
Flexural strength [MPa]		40	45	55	40	60	45	40		41	40	35
Impact strength [kJ/m²]		20	25	25	60	50	23	40	69	20	28	40
HDT [°C]		75	80	80	75	75	75	75	70	75	80	75

* after appropriate thermal treatment (refer to Technical Data Sheet)

Biresin® EP- and PUR-Casting systems

The large range of Biresin® Casting resins based on epoxy and polyurethane can be used in many different ways. The resin systems are highly resistant to mechanical or thermal influences. The system selected depends on the casting procedure in question, e.g. mass casting, backfill or facecasting.

EP-Casting resins

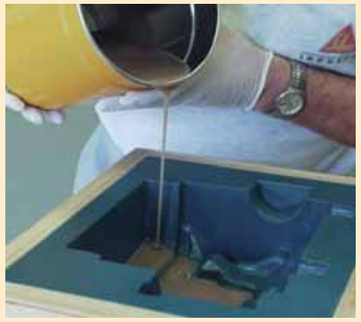
In accordance with their particular application, the Biresin® EP-Casting resins have a good resistance to chemical stress and / or abrasion. Therefore they are suitable for the quick and inexpensive manufacture of production equipment such as foam-, RIM- and vacuumforming moulds as well as foundry patterns and metal sheet forming tools.

Heat-resistant Casting resins

The heat-resistant Biresin® Casting resins belong to an independent product group. According to the product and application the necessary heat resistance is obtained by post treatment or by thermal running. Possible applications are vacuumforming moulds, injection moulds or other production equipment for higher temperatures.

PUR- and Backfill-Casting systems

Biresin® PUR- and Backfill-Casting Systems are suitable above all for inexpensive solutions for production equipment by mass casting or backfill casting. For very light backfilling EP foam Biresin® VP680 can be applied.



Heat-resistant Biresin® Casting resins

Biresin®		A	G36			G38	G46 AL
		B	G36	L74	P7	G38	G46
Mixing ratio	[g]	A	**100**			**100**	**100**
		B	**10**	**6**	**8**	**7**	**25**
Colour			grey			grey	grey
Characteristics			workable, can be casted in thick sections, very heat resistant			good flowing and degassing properties, very heat resistant	easily workable, can be casted in thick sections, heat resistant
Applications			vacuumforming moulds and other heat resistant tools			heat resistant moulds, e.g. vacuumforming moulds	
Processing data (approx.-values)							
Mix. viscosity	[mPas]		18,000	6,700	pasty	10,500	3,000
Potlife	[min]		60-120	60-120	30	120	20-25
Demoulding time	[h]		24*	24*	16-24*	16-24	12-16
Physical data (approx.-values)							
Density	[g/cm³]		1.7			1.8	1.7
Shore-hardness			D 89			D 90*	D 87
Compr. strength	[MPa]		130*	135*	130*	112*	91
HDT	[°C]		141*	> 220*	141*	> 130*	80

Biresin® EP-Casting resins

Biresin®		A	G30				G32		G33 Neu	G37			G49	
		B	G30	F3	F4	S10	F4	F2	S15	F1	F4	S12	L80	L80 R
Mixing ratio	[g]	A	**100**				**100**		**100**	**100**			**100**	
		B	**10**	**5**	**5**	**5**	**7**	**17**	**6**	**10**	**5**	**5**	**36**	**36**
Colour			black				green		black	grey			milky-white	
Characteristics			all-purpose, workable, abrasion resistant, low shrinkage				low viscosity, high filler loading and high casting thickness		very hard, high abrasion resistance, very low shrinkage	high abrasion resistance, very low shrinkage			low viscosity, good impact strength and dimensional accuracy	
Applications			foundry patterns, metal sheet forming tools				backfilling in foundry pattern and mould making		abrasion resistant ways	facecasting layer for foundry patterns and diverse moulds			impact resistant moulds and mouldings for diverse applications	
Processing data (approx.-values)														
Mix. viscosity	[mPas]		40,000	40,000	30,000	50,000	1,700	2,600	10,000	23,000	4,600	15,000	3,000	3,000
Potlife	[min]		60	60	45	20	70	180	45-60	90	90	60	40	35
Demoulding time	[h]		12-16	24-48	24-48	> 12	24	48	16	16-24	16-24	12	24	12-16
Physical data (approx.-values)														
Density	[g/cm³]		2.1				1.6		1.8	2.3			1.1	
Shore-hardness			D 87	D 90	D 88	D 88	D 90	D 86	D 90	D 89	D 88	D 90	D 74	D 78
Compr. strength	[MPa]		96	141	109	139	112	71	120	105	109	124	70	77
HDT	[°C]		67	85	63	65	51	48	95*	85*	60	> 100*	-	-

Biresin® PUR- and Backfill-Casting systems

Biresin®		A	G46	G48	G48	G48	VP680
		B	G46	G55	G55	G55	E670
		C	-	-	TE-Füller	Al-Pulver	E670 blowing agent
Mixing ratio	[g]	A	**100**	**100**	**100**	**100**	**100**
		B	**25**	**100**	**100**	**100**	**30**
		C	**-**	**-**	**350**	**250**	**1-3**
Colour			beige	opaque	beige	grey	light brown
Characteristics			easily workable, can be casted in thick sections, high dimensional accuracy	easily workable, high filler loading, abrasion and impact resistant	easily workable, can be casted in thick sections, high compressive strength		unsensitive against humidity, slow blowing reaction
Applications			master and core models, negatives, foundry patterns	facecasting layer for metal sheet forming tools and foundry patterns	backfilling for metal sheet forming tools and foundry patterns		very light backfilling
Processing data (approx.-values)							
Mix. viscosity	[mPas]		3,000	1,500	castable	castable	castable
Potlife	[min]		40	45-60	45-60	45-60	5-10
Demoulding time	[h]		16-24	16-24	16-24	16-24	24
Physical data (approx.-values)							
Density	[g/cm³]		1.7	1.15	1.7	1.7	approx. 0.3
Shore-hardness			D 87	D 80	D 86	D 84	-
Compr. strength	[MPa]		110	94	104	90	-
HDT	[°C]		80	75	-	-	-

* after appropriate thermal treatment (refer to Technical Data Sheet)

Elastomeric Biresin® Casting resins

The range of elastomeric Biresin® PUR-Casting resins includes high-quality synthetic resin systems with a variety of shore hardness levels (Shore A40 – D70) and possible applications.

■ Elastomeric Casting resins for mould making

The soft elastic types with very high elongation qualities are used for making flexible moulds (similar to silicone) and for castings made of the most varied of materials (even ceramic). The tough elastic products are suitable for more high-resistant moulds and mouldings as well as for wear-resistant coatings in special machine construction.

■ Elastomeric Casting resins for foundry pattern making

The tough elastic types, are mainly used for foundry pattern making. Due to their very high resistance to abrasion, they are suitable for long-life surface layers of core boxes and match plates.

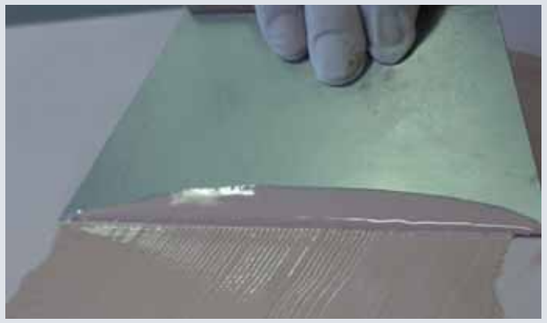
Elastomeric Biresin® Casting resins for mould making

Biresin®			U1404		U1404				U1303		U1305	405	407	411
	B		U1404	U1434	+ U1404 + U1419 L				U1303	U1402	U1305	G55	G55	G53
Mixing ratio [g]	A		80	50	100				100		100	100	100	100
	B		100	100	54 / 6	32 / 8	10 / 10	- / 11	15	35	60	33	53	48
Colour			reddish-transparent	light-beige	reddish-transparent				amber-transparent	coloured-transparent	cream-white	beige	grey	beige
Characteristics			very soft, high elongation, low shrinkage		3-component mix: Shore A 40-A 80 variable				rubbery, insensitive to moisture		high abrasion resistance, can be accelerated by HC586	high abrasion resistant, flexible	high abrasion resistance, can be accelerated by HC586	processed by 2-component unit, fast curing
Applications			ceramic industry, flexible moulds and components		ceramic industry, flexible moulds and components				ceramic industry, moulds for concrete mouldings, flexible mouldings		wear resistant coating, electronic encapsulation	wear protection (mats)	wear resistant coating, electronic encapsulation, moulds for concrete	flexible moulds, e.g. for edge casting
Processing data (approx.-values)														
Mix. viscosity [mPas]			3,000	3,700	3,000-5,800				7,500	4,000	2,300	8,000	700	800
Potlife [min]			25	20	60	90	100	100	45	25	15-20	6-7	25-30	1
Demoulding time [h]			24	> 16	24				16	16	10-16	1 at 50°C	16-24	1.5
Physical data (approx.-values)														
Density [g/cm³]			1.05	1.3	1.05				1.05		1.2	1.25	1.15	1.1
Shore-hardness			A 40	A 55	A 47	A 60	A 74	A 80	A 73	A 81	A 89	A 66	A 85	A 87
Tear strength [N/mm]			7	9	12	16	25	40	9	18	27	6-7	17	21
Elongation at break [%]			> 600	> 600	1,000	1,000	1,000	800	280	400	300	240	220	90

Elastomeric Biresin® Casting resins for foundry pattern making

Biresin®			U1419		U1305 B	U1316		U1320		
	B		U1419	U1320 L	G55 B	U1320 L		U1320 L	U1303	U1320 S Neu
Mixing ratio [g]	A		100		100	100		100		
	B		16	26	95	33		38	38	70
Colour			coloured-transparent		ivory	yellowish-transparent		light beige	light beige	green / white
Characteristics			abrasion resistant, impact and tear resistant, good flowability		favourable physiology, abrasion resistant, impact and tear resistant, good flowability	resistant, impact and tear resistant, long potlife, good flowability		very abrasion resistant, very impact and tear resistant		
Applications			abrasion and impact resistant parts and tools, e. g. core boxes		abrasion and impact resistant parts and tools, e. g. smaller core boxes	abrasion and impact resistant parts and tools, e. g. larger core boxes		high abrasion resistant match plates and with larger dimensions	fast repair, smaller core boxes	high abrasion resistant gelcoat for foundry patterns and core boxes
Processing data (approx.-values)										
Mix. viscosity [mPas]			2,800	3,500	550	4,000		7,000	7,000	pasty
Potlife [min]			6-7	25-30	6-8	25-30		20	10	18
Demoulding time [h]			1-3	24	12-16	16		12-16	> 4	12-16
Physical data (approx.-values)										
Density [g/cm³]			1.1		1.2	1.1		1.1	1.1	1.2
Shore-hardness			A 98 (D 54)	A 96 (D 50)	D 65	D 60		D 67	D 67	D 67
Tear strength [N/mm]			68	30	80	83		100	105	98
Elongation at break [%]			375	160	190	150		140	135	135
Abrasion resistance [mm³]			90	150	130	120		68	68	140

Biresin® Adhesive and Filler systems



The Biresin® Adhesive and Filler systems are specially adapted to SikaBlock® boards. This relates to colour and mechanical-physical properties. This results in a similiar behaviour regarding machinability and subsequent use in application.

■ Biresin® Adhesives

In the development of adhesives, special attention is paid to achieving a sufficiently high degree of adhesive strength and rapid curing.

■ Biresin® Filler systems

The creamy-soft consistence of the filler systems results in easy application properties. They are also suitable for levelling, repairing and moulding of models and negatives out of Biresin® Tooling resins, wood and metal etc. for model-, mould and tool making.

Biresin® Adhesives

Biresin®			Kleber orange	Kleber braun	Power Adhesive	M60	G26	G28	Fast Adhesive
	B		G53	G53	Power Adhesive	S10	G26	G26	Fast Adhesive
Mixing ratio [g]	A		**100**	**100**	**100**	**100**	**100**	**100**	**100**
	B		**65**	**65**	**30**	**15**	**100**	**100**	**60**
Colour			orange	brown	yellowish-transparent	brown	beige	beige	green / blue
Characteristics			colour and mechanical properties adjusted to M450	colour and mechanical properties adjusted to M550	resistant to high mechanical stresses, good chemical resistance	similar properties like M550, M610	very fast curing, good mechanical properties	fast curing, good mechanical properties	resistant to high mechanical stresses, fast curing
Applications			bonding of M450	bonding of M550, M610	bonding of boards	bonding of M550, M610	very fast bonding of model boards	fast bonding of model boards	fast bonding and fast filler for tooling boards
Processing data (approx.-values)									
Material consumption [kg/m²]			0.9	0.9	0.7	0.6	0.7	0.7	0.7
Potlife [min]			20	20	30	15	3-4	7-8	3
Setting time [h]			6-8	8-10	16	7-8	45 min	2	1
Physical data (approx.-values)									
Density [g/cm³]			0.8	0.8	1.15	0.7	1.1	1.1	1.2
Shore-hardness			D 61	D 63	D 83	D 69	D 70	D 68	D 83
Flexural strength [MPa]			28	30	102	32	40	41	85

Biresin® Filler systems

Biresin®		Spachtel orange	Spachtel braun	Spachtel weiß		Fast Adhesive
	B	BPO-Paste	BPO-Paste	BPO-Paste		Fast Adhesive
Mixing ratio [g]	A	**100**	**100**	**100**		**100**
	B	**2**	**2**	**2**		**60**
Colour		orange	brown	white		green / blue
Characteristics		good adhesion, non sticking and fast curing, easily to grind				fast setting and very high mechanical properties
		colour adjusted to M450	colour adjusted to M550	suitable for M1000		
Applications		levelling, repair and modeling of surfaces				fast filler
		M450	M550, M610	M1000		tooling boards
Processing data (approx.-values)						
Potlife [min]		5	5	5		3
Setting time [min]		> 20	> 20	> 20		1 h
Physical data (approx.-values)						
Density [g/cm³]		1.3	1.6	1.9		1.2
Shore-hardness		D 58	D 70	D 75		D 83

Auxiliary materials

Surface pre-treatment

High-grade release agents, primer and cleaner providing an optimal surface pre-treatment.

Surface pre-treatment (release agent, primer, cleaner)						
Name	**Sika® Trennmittel 810**	**Sika® Trennmittel 815 Quick**	**Sika® Trennwachs 818**	**Icosit® KC 330 Primer**		**Sika® Reinigungsmittel 5**
Colour	milky	milky	whitish	yellowish-transparent		clear-transparent
Delivery unit	0.7 kg 3.5 kg	0.68 kg 3.4 kg	0.7 kg	3 l		1 l, 5 l, 10 l
Description	low viscous, silicone free wax dispersion	low viscous, silicone free wax dispersion with fast drying	pasty wax dispersion	low viscous 1-component-PUR-system		mild solvent mixture
Applications	release agent for EP- and PUR-gelcoats and casting resins	release agent for EP- and PUR-gelcoats and casting resins	release wax for EP- and PUR-gelcoats and casting resins	increasing of adhesion of PUR-synthetic resins on metal and plastics		cleaning of tools and surfaces
Processing data (approx.-values)						
Material consumption [g/m²] - Brushed coats - Sprayed coats	 70 30	 70 30	 50-100 -	 50-200 -		 - -
Drying time [min]	20-30	5-10	10-15	60-120		-
Physical data (approx.-values)						
Density [g/cm³]	0.77	0.75	0.79	1.0		0.8

Additives

Additives are added to Biresin® systems to reach a specific thixotropy, thinning, acceleration or colouring of products.

Additives (thixotroping, thinning, acceleration, colouring)				
Name	**Stellmittel T**	**Sikamoll**	**Biresin® HC 586**	**Biresin® Farbpasten**
Colour	white	clear-transparent	clear-transparent	see below
Delivery unit	1.0 kg	10 kg	0.5 kg	0.5 kg
Description	light weight, non dusty powder	non-volatile softener	amine based catalyst	colours: white, black, green, red, blue, yellow
Applications	thixotroping of EP- and PUR-systems	flexibilisation of PUR-systems	reaction acceleration of some PUR-systems (e. g. U1305, G46)	colouring of EP- and PUR-systems

Filling materials

Filling materials serves for modification of properties of Biresin® Laminating-, Multipurpose- and Casting resins, e.g. for improving the shrinkage and adapting the thermal conductivity. Especially on castings of higher volumes the material costs can be reduced.

Filling materials								
Name		**Aluminiumgrieß**	**Aluminiumpulver (AL-Sprühgrieß)**	**KR-Füller grob**	**KR-Füller fein**	**LF-Füller**	**TE-Füller**	**PVC-Brandgranulat**
Colour		silver to matt-grey	silver to matt-grey	white	white	grey	white	grey
Delivery unit		25 kg paper bag	25 kg paper bag	25 kg paper bag	25 kg paper bag	20 kg paper bag	25 kg paper bag	30 kg paper bag
Description		aluminium grit	aluminium powder	white granulated calcium carbonate	white, fine granulated calcium carbonate	lightweight powder, based on microsilicate	aluminium hydroxide powder	hard PVC, milled
Applications		backfill castings with good thermal conductivity and good machinability	backfill castings with good thermal conductivity and good machinability	light mouldings	light mouldings	mouldings with low density	light mouldings with good workability	mouldings and backfill casting with low shrinkage
Processing data (approx.-values)								
Bulk density		1-1.5	1.0	-	-	0.4	1.2	-
Mixture for example		G32 Resin : Filler (100 : 100)	G27 Resin : Filler (100 : 300)	G46 Resin : Filler (100 : 100)	G46 Resin : Filler (100 : 80)	G27 LR Resin : Filler (100 : 100)	G26 Resin : Filler (100 : 250)	G48 Resin : Filler (100 : 150)
Physical data (approx.-values)								
Density [g/cm³]		2.7	2.7	2.7	2.7	0.6	2.4	1.4
Grain [mm]		0.6-1.2	0-0.070	1.0-1.5	0.35-0.7	0.01-0.25	0-0.032	0-6