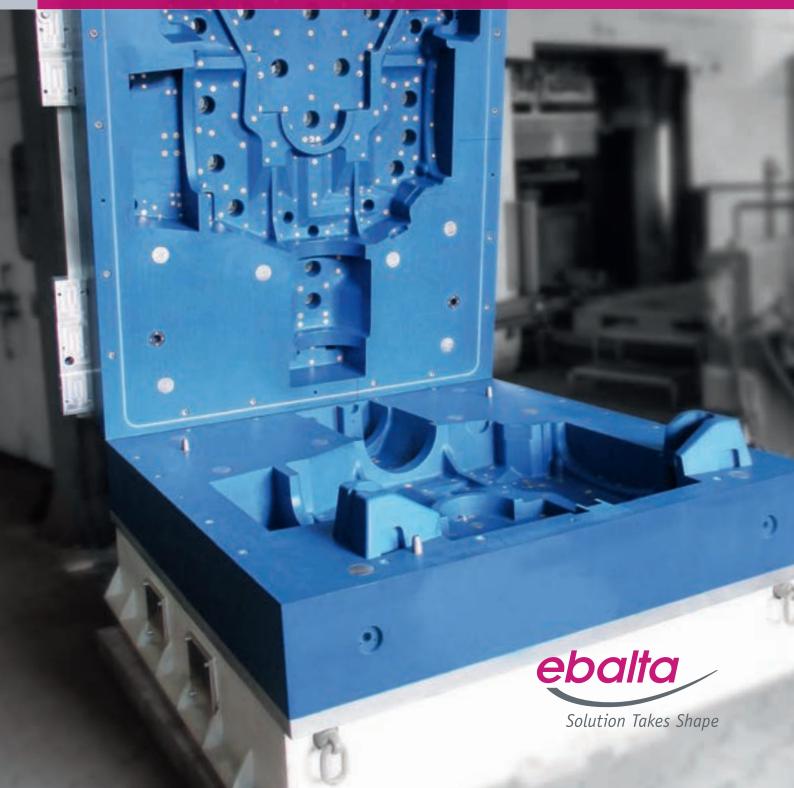
# High-performance tooling resins by ebalta. Your advance in foundry pattern making.

Polyurethane and Epoxy Resins Boards and Blocks Silicones Auxiliaries



# Always sound advice. Especially about the right product.

With the variety of materials and products available in the field of foundry tooling, numerous factors have to be considered when choosing materials. The following pages offer you both direction and overview. If you need any further advice, just ask us.

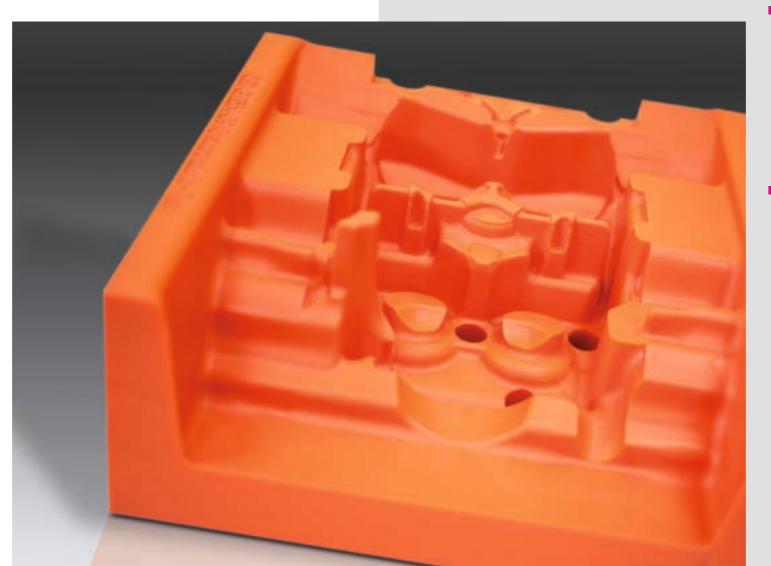
# Custom solutions for your job

Economical, fast, precise: the demands made on foundry patterns are enormous and rapidly growing. *ebalta* offers you a wide range of products, including epoxy and polyurethane resin systems as well as board and block materials. Each product possesses different properties, depending on the requirements. The following questions can assist in determining the right choice of materials:

- What is supposed to be manufactured: a model, a core box or a negative?
- How many units does it need to produce?
- What size?
- What process (high pressure forming, multi-punch presses etc.) and/or core making process, e.g. cold box will be used?

# Individual advice for your job

No matter what your question or application is, just ask our international sales partners. They recommend the right product and process to suit your individual application. They are happy to work with you on site at your facility for as long as it takes to get your model right.



# Individual jobs need individual solutions. And a flexible product range.

Anytime individual solutions are required, a flexible product range is the best foundation. **ebalta** offers a broad spectrum of specialised services and products for foundry pattern making that meets all specific requirements, including expert customer support.

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# Product recommendations for various manufacturing processes

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Cast and laminated core boxes
Milled patterns and core boxes
Negatives

# Products and specifications

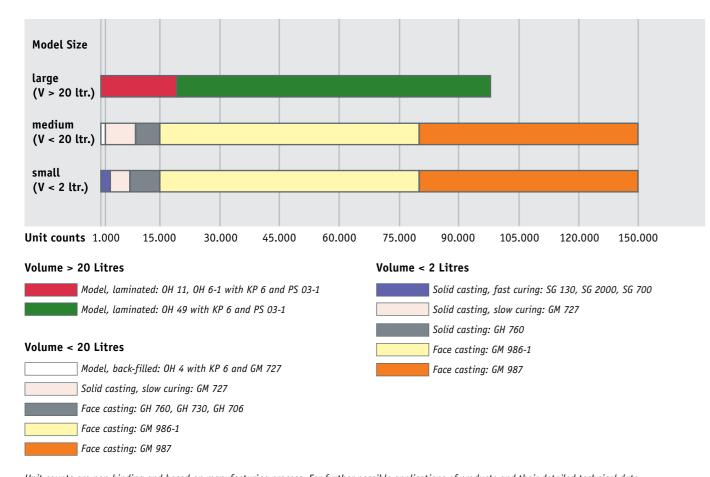
Board and block material <b>ebaboard</b> and <b>ebablock</b> ®	8
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# Product recommendations for various manufacturing processes: Cast and laminated patterns.

Which product is suitable for manufacturing cast pattern depends on the size of the model and the unit count. Whether it's a solid casting, face casting or lay-up process: all **ebalta** products are superbly user-friendly and have stood the test of time. Further benefits include high dimensional accuracy and low sand build-up.

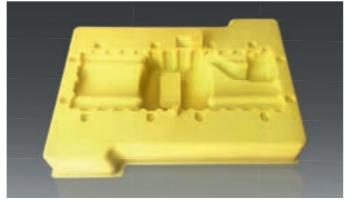
# Cast and laminated core boxes.

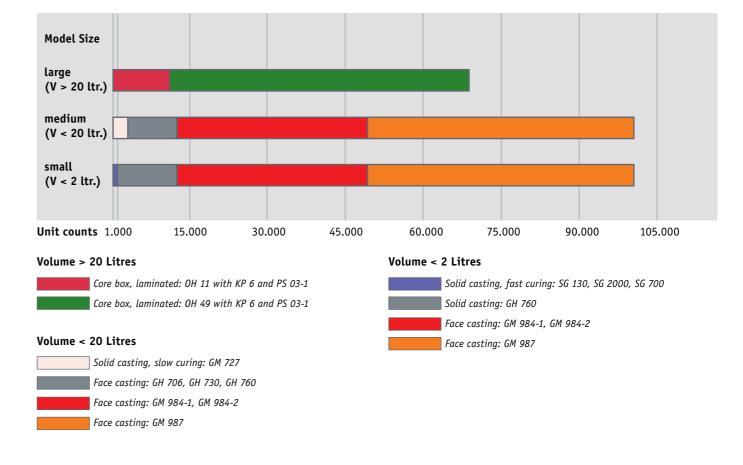
Unit count and model size determine the choice of material for cast core boxes. Whether it's a solid casting, face casting or lay-up process – **ebalta** products are extremely abrasion resistant, withstand the high pressure and high stress of the core box process, and are chemical resistant. Even very high unit counts can be consistently produced with our products.



Unit counts are non-binding and based on manufacturing process. For further possible applications of products and their detailed technical data, please see pages 10-14.







Unit counts are non-binding and based on manufacturing process. For specifications and other technical information, please see pages 10-14.





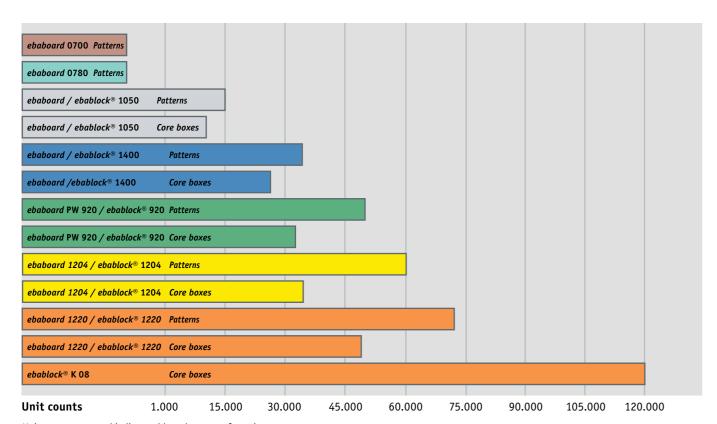
Pattern made of GM 984-2 Pattern made of GM 986-1 Core box made of GM 987

# Milled patterns and core boxes.

ebalta offers a wide product range for milled patterns and core boxes. We offer the best solutions for any number of castings. Depending on whether it is **ebaboard** or **ebablock**® material: we have the right material for your required geometries and dimensions.

# Negatives.

No matter which fabrication technique or quality you desire, we offer well-established, high-quality products for fast fabrication of negatives.



Fabrication technique	Quality			
	Standard	High-quality		
Casting	SG 700 / SG 2000	GM 727		
Laminating	ОН 4	OH 11		
Milling	ebaboard 0700	ebaboard 1050 / ebablock® 1050		
Milling	ebaboard 0780	ebaboard PW 920 / ebablock® 920		
For specifications and other technical inform	ation, please see pages 8-13.			

Unit counts are non-binding and based on manufacturing process. For specifications and other technical information, please see pages 8-9.





Core box made of ebaboard PW 920





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Negative made of GM 727 Negative made of OH 11 with PS 03-1

# Board and block material: ebaboard – board materials for foundry patterns.

Material	ebaboard 0600	ebaboard 0700	ebaboard 0780	ebaboard 1050	ebaboard 1204
				ebablock® 1050	ebablock® 1204
Colour	brown	brown	turquoise	light grey	yellow
Applications	master models, design models, foundry patterns	master models, design models, foundry patterns	master models, foundry patterns, laminating tools	foundry patterns, core boxes, jigs	core boxes, foundry patterns, pattern plates
Properties	dense surface, fine structure, very easy to work	dense surface, very fine structure, very easy to work	very fine structure, high strength values, good edge strength	easy to work, fine structure	high abrasion resistance, very good edge strength, very shock resistant, very dense surface
Density at 20°C (g/cm³)	0,60 ± 0,02	0,70 ± 0,02	0,78 ± 0,02	1,05 ± 0,02	1,20 ± 0,02
Physical data					
Flexural modulus (MPa)	900 ± 200	1250 ± 100	1662 ± 60	2500 ± 200	2950 ± 300
Compressive strength (MPa)	17 ± 0,2	20 ± 0,2	31 ± 2	50 ± 5	90 ± 5
Impact resistance (Charpy) (kJ/m²)	4,5 ± 0,5	4,5 ± 0,5	5,8 ± 0,2	9 ± 1	66 ± 9
Heat resistance HDT DIN EN ISO 75 B (°C)	73 ± 5	78 ± 3	86 ± 1	98 ± 3	87 ± 3
Shore hardness (Shore D)	55 ± 2	61 ± 2	67 ± 2	78 ± 2	84 ± 3
Coefficient of linear expansion 20-50°C (10-6K-1)	approx. 59	approx. 49	approx. 63	approx. 60	approx. 77
Wear jet test W (V/t) [mm³/min]			approx. 352	approx. 196	approx. 82
Delivery dimensions					
ebaboard – board material (mm)	1500 x 500 x 30 1500 x 500 x 50 1500 x 500 x 75 1500 x 500 x 100 1500 x 500 x 150 1500 x 500 x 200	1500 x 500 x 30 1500 x 500 x 50 1500 x 500 x 75 1500 x 500 x 100 1500 x 500 x 150 1500 x 500 x 200	1500 x 500 x 50 1500 x 500 x 75 1500 x 500 x 100	1000 x 500 x 50 1000 x 500 x 75 1000 x 500 x 100 special sizes on request	1000 x 500 x 50 1000 x 500 x 75 1000 x 500 x 100 special sizes on request
ebablock® – block material				individual dimensions	individual dimensions
Adhesive, repair putty and casting resins					
Adhesive and repair putty	Adhesive and repair putty brown	Adhesive and repair putty brown	Adhesive and repair putty green	Adhesive and repair putty light grey	Adhesive and repair putty yellow
Casting resin	Casting resin brown	Casting resin brown	Casting resin green	Casting resin light grey	Casting resin yellow





# ebablock® – the net-sized contour block material for jointless foundry patterns.

Material	ebaboard 1220 ebablock® 1220	ebaboard PW 920 ebablock® 920	ebablock® K08	ebaboard 1400 ebablock® 1400	ebablock® 1820
Colour	orange	green	salmon pink	blue	beige
Applications	foundry patterns, core boxes, pattern plates	foundry patterns, core boxes, pattern plates	core boxes	foundry patterns, core boxes, pattern plates	foundry patterns, jigs, mould constructions
Properties	high abrasion resistance, dimensionally accurate	high quality surface, abrasion resistant, good edge strength	very high abrasion resistance, very shock resistant, dense surface	low coefficient of linear expansion, high abrasion resistance, fine structure	low coefficient of linear expansion, high heat resistance
Density at 20°C (g/cm³)	1,21 ± 0,02	1,22 ± 0,03	1,35 ± 0,04	1,38 ± 0,03	1,82 ± 0,03
Physical data					
Flexural modulus (MPa)	3000 ± 200	3100 ± 200	-	4175 ± 100	11000 ± 400
Compressive strength (MPa)	92 ± 8	95 ± 5	-	102 ± 5	106 ± 5
Impact resistance (Charpy) (kJ/m²)	60 ± 10	50 ± 10	-	19,5 ± 2	4 ± 0,5
Heat resistance HDT DIN EN ISO 75 B (°C)	82 ± 4	80 ± 3	-	87 ± 2	90 ± 5
Shore hardness (Shore D)	85 ± 3	85 ± 3	74 ± 3	85 ± 3	90 ± 3
Coefficient of linear expansion 20-50°C (10-6K-1)	approx. 73	approx. 87	approx. 150	approx. 69	approx. 53
Wear jet test W (V/t) [mm³/min]	approx. 73	approx. 91	approx. 55	approx. 99	approx. 208
Delivery dimensions					
ebaboard – board material (mm)	1000 x 500 x 50 1000 x 500 x 75 1000 x 500 x 100 special sizes on request	1000 x 500 x 30 1000 x 500 x 50 1000 x 500 x 75 1000 x 500 x 100 special sizes on request		1000 x 500 x 30 1000 x 500 x 50 1000 x 500 x 75 1000 x 500 x 100 special sizes on request	
ebablock® – block material	individual dimensions	individual dimensions	individual dimensions	individual dimensions	individual dimensions
Adhesive, repair putty and casting resins					
Adhesive and repair putty	Adhesive and repair putty orange	Adhesive and repair putty green	Adhesive and repair putty ebablock® K 08	Adhesive and repair putty blue	Adhesive and repair putty beige
Casting resin	Casting resin orange	Casting resin green		Casting resin blue	





Pattern made of ebablock® 1050 Core box made of ebaboard 1220 Pattern made of ebablock® 920 Core box made of ebaboard 1400

# Polyurethane casting resins rigid and flexible.

**ebalta** PU systems: high abrasion resistance, low exothermic characteristics, high dimensional accuracy and casting of large volume. Matching the individual requirements of your patterns.

Material	GM 727	GM 984-1	GM 984-2	GM 986-1	GM 987
Hardener	Comp. B	Comp. B	Comp. B	Comp. B	Comp. B
Colour	beige	reddish-transparent	reddish-opaque	yellow opaque	orange-opaque
Mixing ratio (p. b. w.)	100:22	100:130	100:130	100:26	100:21
Applications	foundry patterns, negatives, pattern plates	core boxes	core boxes	foundry patterns	foundry patterns, core box
Material properties	thick castable, dimensionally accurate, workable, heat resistant	long pot life, big volume	very good dimensional stability	dimensionally stable at high temperature	excellent abrasion resistance
Processing data					
Viscosity at 25°C (mPas)	6000 ± 800	3500 ± 500	2700 ± 400	5800 ± 500	7700 ± 300
Density at 20°C (g/cm³)	1,70 ± 0,05	1,15 ± 0,02	1,15 ± 0,02	1,10 ± 0,02	1,14 ± 0,02
Pot life 200 g /20°C (min.)	25-35	30-45	17-20	16-20	14-17
Curing time at RT (hrs.)	12-16	12-16	12-16	14-18	16-18
Physical Data					
Flexural strength (MPa)	75 ± 5	28 ± 1	31 ± 1	35 ± 5	$18 \pm 0.3$
Flexural modulus (MPa)	8250 ± 500	787 ± 40	825 ± 40	850 ± 100	470 ± 25
Heat resistance					
HDT DIN EN ISO 75 B (°C)	76 ± 3	=	-	-	-
Shore hardness (Shore D)	90 ± 3	65 ± 2	67 ± 2	70 ± 2	65 ± 2
Wear jet test					
W (V/t)[mm³/min]	approx. 210	approx. 41	approx. 40	approx. 35	approx. 15

# Fast casting resins.

For decades the filled and unfilled fast curing resins from ebalta have been a force to be reckoned with in the field of foundry pattern making. Fast, accurate, environment-friendly and inexpensive, they are easy and economical to use.

Material	SG 130	SG 2000	SG 700
Hardener	PUR 11	Comp. B	PUR 5
Colour	ivory	ivory	blue
Mixing ratio (p. b. w.)	100:100	100:100	100:15
Applications	foundry patterns, core boxes, prototypes, negatives	foundry patterns, core boxes, negatives, control castings	foundry patterns, core boxes, mould take-up
Material properties	unfilled, impact resistant, high strength	unfilled, very low viscosity, high filler content possible	well castable, fine structure, dimensionally accurate, fast curing
Processing data			
Viscosity at 25°C (mPas)	65 ± 20	50 ± 5	3050 ± 250
Density at 20°C (g/cm³)	1,10 ± 0,02	1,10 ± 0,02	1,70 ± 0,05
Pot life 200 g /20°C (min.)	2,5-3,5	2,5-3,5	5-6
Curing time at RT (hrs.)	0,5-1,5	0,5-1	1-2
Physical Data			
Flexural strength (MPa)	60 ± 5	57 ± 5	40 ± 4
Flexural modulus (MPa)	1000 ± 100	1500 ± 100	4500 ± 400
Compressive strength (MPa)	47 ± 5	45 ± 5	60 ± 5
Impact resistance (Charpy) (kJ/m²)	26 ± 2,5	24 ± 4	4 ± 0,5
Heat resistance HDT DIN EN ISO 75 B (°C)	84 ± 3	86 ± 3	78 ± 3
Shore hardness (Shore D)	72 ± 2	72 ± 2	83 ± 3









Core box made of **GM 984-1** Pattern made of **SG 2000** Pattern made of **SG 2000** 

# General purpose and epoxy casting resins.

**ebalta** general purpose resins and epoxy casting resins are the products of choice for large-surface models with high accuracy. They are pleasant to work with and contract only slightly.

Material	AH 100	AH 110	GH 706	GH 730	GH 760
Hardener	TGL*	TGL*	GL	BR	GL
Colour	yellowish transp.	yellowish transp.	blue	black	grey
Mixing ratio (p. b. w.)	100:20	100:22	100:10	100:10	100:10
Applications	laminating resin for fabrics, bonding resin for fillers	laminating resin also for heavy fabrics, bonding	foundry patterns, core boxes, coping models	foundry patterns, core boxes, mould take-up	foundry patterns, core boxes, boards
Material properties	unfilled, slow curing, large volume backfilling	resin for fillers unfilled, high strength, very heat resistant	abrasion resistant, fine structure, good compressive strength	impact resistant, versatile	high dimensional accuracy, abrasion resistant, high strength, castable until 40 mm
Processing data					
Viscosity at 25°C (mPas)	550 ± 100	1000 ± 150	10000 ± 2000	8000 ± 1500	9500 ± 1000
Density at 20°C (g/cm³)	1,12 ± 0,02	1,13 ± 0,02	2,05 ± 0,05	2,20 ± 0,05	2,20 ± 0,05
Pot life 200 g /20°C (min.)	65-75	55-65	30-40	35-45	45-55
Curing time at RT (hrs.)	18-20	15-18	12-16	12-14	18-24
Physical Data					
Flexural strength (MPa)	105 ± 5	135 ± 10	83 ± 2,6	80 ± 5	100 ± 10
Flexural modulus (MPa)	3000 ± 200	3300 ± 300	8424 ± 380	7800 ± 400	7250 ± 500
Flexural expansion at breakage (%)	4,7 ± 0,5	$6.3 \pm 0.7$	1,3 ± 0,07	1,25 ± 0,2	1,5 ± 0,2
Compressive strength (MPa)	100 ± 8	115 ± 10	104 ± 4	105 ± 10	120 ± 10
Impact resistance (Charpy) (kJ/m²)	37 ± 10	16 ± 8	7 ± 1	6 ± 2	9 ± 1,5
Heat resistance					
HDT DIN EN ISO 75 B (°C)	76 ± 2	101 ± 3	67 ± 2	64 ± 2	63 ± 2
Shore hardness (Shore D)	87 ± 3	85 ± 3	90 ± 3	90 ± 3	89 ± 3
Coefficient of linear					
expansion 20-50°C (10 <sup>-6</sup> K <sup>-1</sup> )	-	-	approx. 60	approx. 74	approx. 59
Wear jet test					
W (V/t)[mm <sup>3</sup> /min]	-	-	approx. 357	approx. 151	approx. 257

<sup>\*</sup> The specifications and physical data for the general purpose resins can be individually selected, as different hardeners are available.





# Gel coats.

These materials are used mainly in lay-up processes for large-surface models with a gel coat and a corresponding resin backing. Our highly versatile products are easily applied and optimally bonded with corresponding coupling pastes.

Material	OH 4	OH 6-1	OH 11	OH 49
Hardener	CH-3	CH-3	PUR 3	Comp. B
Colour	white	blue	red brown	green
Mixing ratio (p. b. w.)	100:17	100:11,5	100:40	100:36
Applications	negatives, master models	foundry patterns, coping models	foundry patterns, core boxes	foundry patterns, core boxes, pattern plates
Material properties	universal, very good spreadable	fine structure very abrasion resistant	abrasion resistant, impact resistant, polyurethane base	very abrasion resistant, hard elastomeric, polyurethane base
Processing data				
Viscosity at 25°C (mPas)	thixotrope	thixotrope	thixotrope	thixotrope
Density at 20°C (g/cm³)	1,40 ± 0,05	1,75 ± 0,05	1,27 ± 0,02	1,15 ± 0,02
Pot life 200 g /20°C (min.)	15-20	20-25	20-25	12-16
Curing time at RT (hrs.)	3-5	20-24	3-5	14-20
Physical Data				
Flexural strength (MPa)	95 ± 5	87 ± 5	65 ± 5	-
Flexural modulus (MPa)	4700 ± 100	6600 ± 100	3568 ± 250	480 ± 50
Compressive strength (MPa)	95 ± 1	102 ± 2	75 ± 5	-
Impact resistance (Charpy)				
(kJ/m²)	17 ± 3	8 ± 1	8,6 ± 1	-
Heat resistance				
HDT DIN EN ISO 75 B (°C)	85 ± 3	97 ± 3	70 ± 2	-
Shore hardness (Shore D)	90 ± 3	90 ± 3	86 ± 3	66 ± 3
Wear jet test W (V/t)[mm³/min]	-	approx. 230	approx. 233	approx. 28





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Pattern made of **GH 706**Pattern made of **GH 760**Pattern made of **GH 760**Pattern made of **GH 760**Application of gel coat **OH 6-1** 

# Additives and ancillary equipment.

Glass and carb	on fibres	Release agents		Fillers	
Stapel fibre cloth	170 g/m², 280 g/m², 445 g/m², fast build-up of big laminate	T 1-1	liquid, fast drying, polishable, also available as spray	Light fillers, MF-paste, alu powder, plast	filler F-A, F-B, F-alu, F-iron, F-G, I-granules, alu-powder, slate ic granules, Thixo 200, Thixo 01,
Chopped	length of fibre 6 mm	Т 2	pasty, soft, polishable	cotton flocks	, steel powder
glass strands Glass	163 g/m², 290 g/m²,	T 03-01	liquid, heatresistant until	Synthetic gy	psum nating-System, Ludur XL
filament fabrics	445 g/m², 600 g/m²	Т 7	pasty, well polishable, resistant up to 80 °C	July Eam	
Carbon fibres	195 g/m², 245 g/m², 400 g/m²	T 17	semipermanent,	Wax sheets	
			high-temperature resistant	Special sheets	light brown, 305 x 610 mm, self adhesive, smooth,
D. 1		T 18	water-based release agent	130 °C	0.25-7 mm, 130 °C
Polyester filler		Honey Wax	very well polishable	Standard	lemon yellow, 305 x 610 mm,
Fast curing modelpaste	brown, very easy processing and grinding	1711	spray, , contains silicone, resistant up to 125 °C	sheets 64 °C	self adhesive, soft, 1–6 mm, 64 °C
ebalta-lastic	grey, high filling properties,	PTFE	spray, contains teflon, non-sticking, heat and chemical resistant	-	terials for vacuum infusion
	very easy processing and grinding	PVA	liquid, builds a shiny heat and chemical resistant film,	Consumer materials for composites and vaccuum injection	
ebalta-plast	white or mahagony, very dense structure, free of pores	Mould sealers	removable with water		
Repair- paste	silver coloured, heat resistant,	Sealer 02 Sealer 09	Sealer for EP and PU boards	Accessories PU-colour	red, blue, green, yellow, white,
puste	repair metal or plastic	Pore sealer	liquid, fast drying,	pastes	black, brown
Fibre-	contains glass fibres,		sandable and sprayable, seals rough surfaces such as wood or gypsum	Silicone colour pastes	white, blue
polyester	reinforcing			Additives and	ebaclean, Superplastiline, brushes, mixing pots, instant
Polyester liquid	unfilled, addition of various fillers possible			ancillary equipment	adhesives, spray adhesive, hand cream, gloves, taps, container, stirrer, ebasafe: fixing systems

# Laminating and coupling pastes.

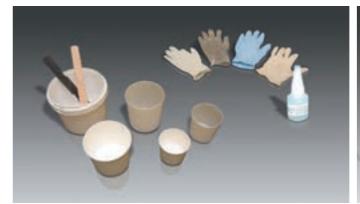
**ebalta** coupling pastes: the best material for back filling of large gel coat patterns during the build-up process. Our laminate pastes are the best material for easy of processing.

Material	KP 6		KP 8	PS 03-1
Hardener	TGL BR		Comp. B	PS 03-1 L
Colour	grey	grey		blue grey
Mixing ratio (p. b. w.)	100:18	100:18 100:26		100:11
Applications	coupling paste for EP gel coat with EP backfilling	coupling paste for PU gel coat OH 49 with EP backfilling	coupling paste hard elastic PU resin, couplingpaste for aluminium carrier in front layer casting	core boxes, negatives, foundry patterns
Material properties	aluminium filled, heat resistant		well spreadable, good bonding agent	glass fiber filled, heat resistant, softg
Processing data				
Viscosity at 25°C (mPas)	thixotrope		thixotrope	pasty
Density at 20°C (g/cm³)	1,30	± 0,05	1,24 ± 0,02	$0.96 \pm 0.03$
Pot life 200 g /20°C (min.)	30-40		20-25	40-50
Curing time at RT (hrs.)	8-12		-	16-24
Physical Data				
Flexural strength (MPa)	-		-	35 ± 5
Flexural modulus (MPa)	-		-	4800 ± 400
Flexural expansion at breakage (%)	-		-	1,3 ± 0,3
Compressive strength (MPa)	-		-	45 ± 4
Impact resistance (Charpy) (kJ/m²)			-	4,5 ± 0,5
Heat resistance	100 ± 3	95 ± 3	_	68 ± 2
HDT DIN EN ISO 75 B (°C)	100 ± 3	1 3 T 3		00 ± E





Core box made of OH 11 with PS 03-1





for foundry patterns

Mixing pots, gloves and instant adhesive

Brushes and stirrers available in different sizes

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