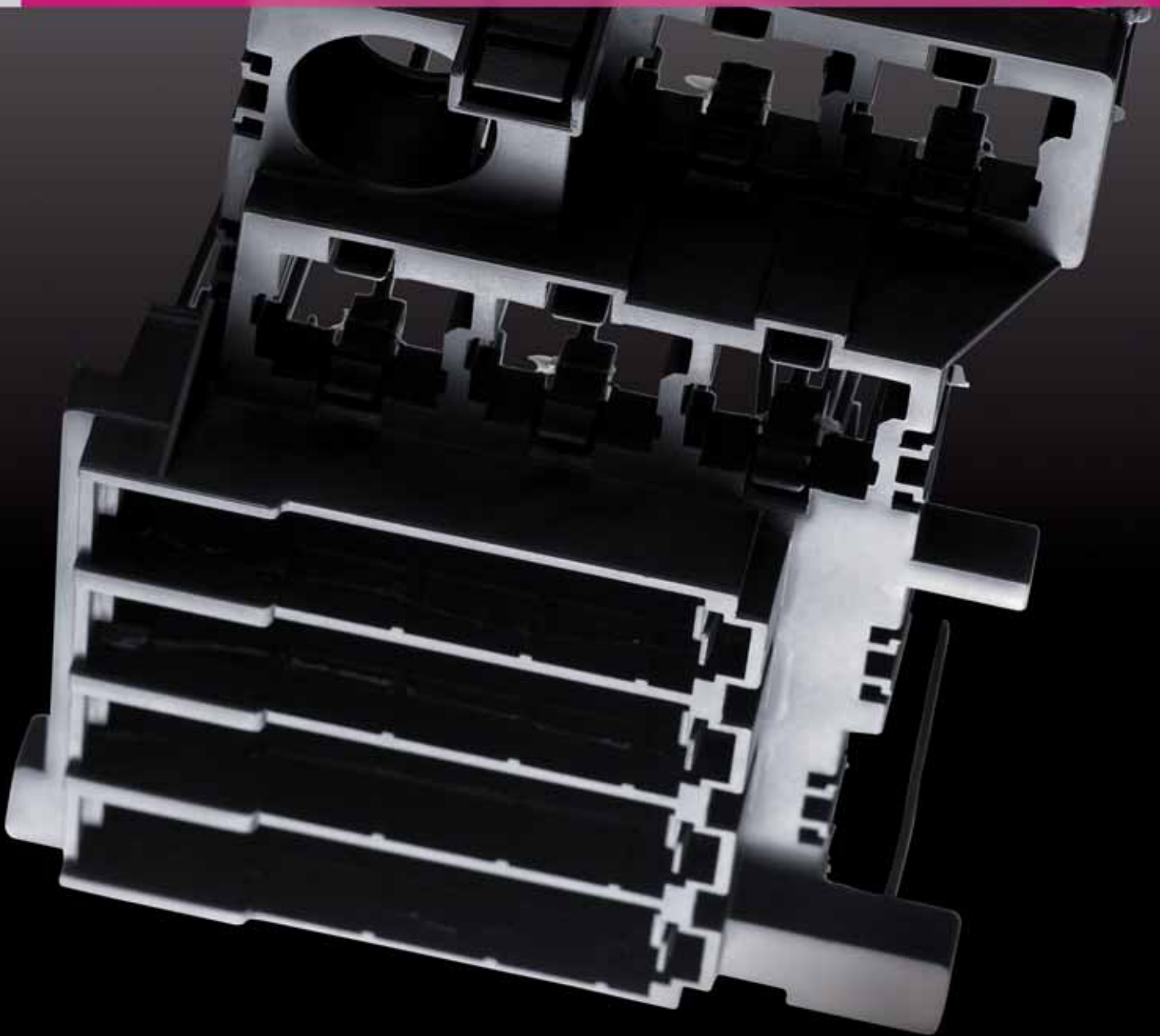


*Rapid Prototyping Rapid Manufacturing Rapid Tooling.
The decisive step ahead.*

tooling resins blocks ancillaries silicones



ebalta
Solution takes shape

Resin systems are our speciality. Particularly the bespoke ones.

*In 1974 **ebalta** started production of high-quality resin systems, thus laying the foundation stone for a successful company history. In over 30 years of experience **ebalta** has gained an acknowledged expertise in special materials for the rapid production of prototype parts as well as pilot lots, small and medium series. In the meantime, the name **ebalta** stands for a wide variety of high-performance special resins in this sector – and for comprehensive advice and support for every single project.*

Factor flexibility: individual tasks call for individual materials

Product developments in Rapid Prototyping, Rapid Manufacturing and Rapid Tooling place very high demands on the materials that are processed into parts by vacuum or low-pressure methods. The desired product features may differ significantly between automobile, plant engineering, consumer goods, interior fittings and agricultural technology depending on the field of application. Standard products only meet these requirements to a certain extent.

The solution: our high-performance resin systems that are precisely matched to your tasks. Combined with the intensive support of our experts, from the first questions through to the finished parts, we can guarantee perfect results.

Trust is good. Experience better.

Intensive support and know-how become decisive criteria for success wherever time, process reliability and specific requirements play a role. You have a requirements profile – we have the right material and offer competent advice.

More variety with bespoke solutions

ebalta special resins for vacuum and low-pressure processes are matched to your individual requirements in our laboratory. The materials are modified accordingly or new ones developed. **ebalta** resin systems are established as high-quality materials that can reproduce certain properties of the serial material. **ebalta** also offers the right products for mould and tool making: casting resins, boards and blocks and silicones. What this means for you? You receive the material required for the respective job. Reliable production sequences. And the fastest possible time to market.

Fast, versatile, variable:

ebalta materials for Rapid Prototyping, Rapid Manufacturing and Rapid Tooling

- Casting resins
- Silicones
- Boards and blocks
- Auxiliaries and accessories

Fast, guaranteed: worldwide distribution network

ebalta will deliver your product quickly and reliably – including customer support, order assembly and shipping. Making you that little bit faster on the market.

Contents

- **Parts production (Rapid Prototyping and Rapid Manufacturing)** _____ **4-7**
 - ebalta** polyurethane systems compared to thermoplastic materials _____ 4-5
 - Resin systems for low pressure (RIM) _____ 6
 - Vacuum casting resin systems _____ 7
- **Mould and tool making (Rapid Tooling)** _____ **8-10**
 - Mould making materials for low pressure (RIM) – 8-9
 - Silicones for vacuum casting _____ 10
- **Production ancillaries from ebalta** _____ **11**

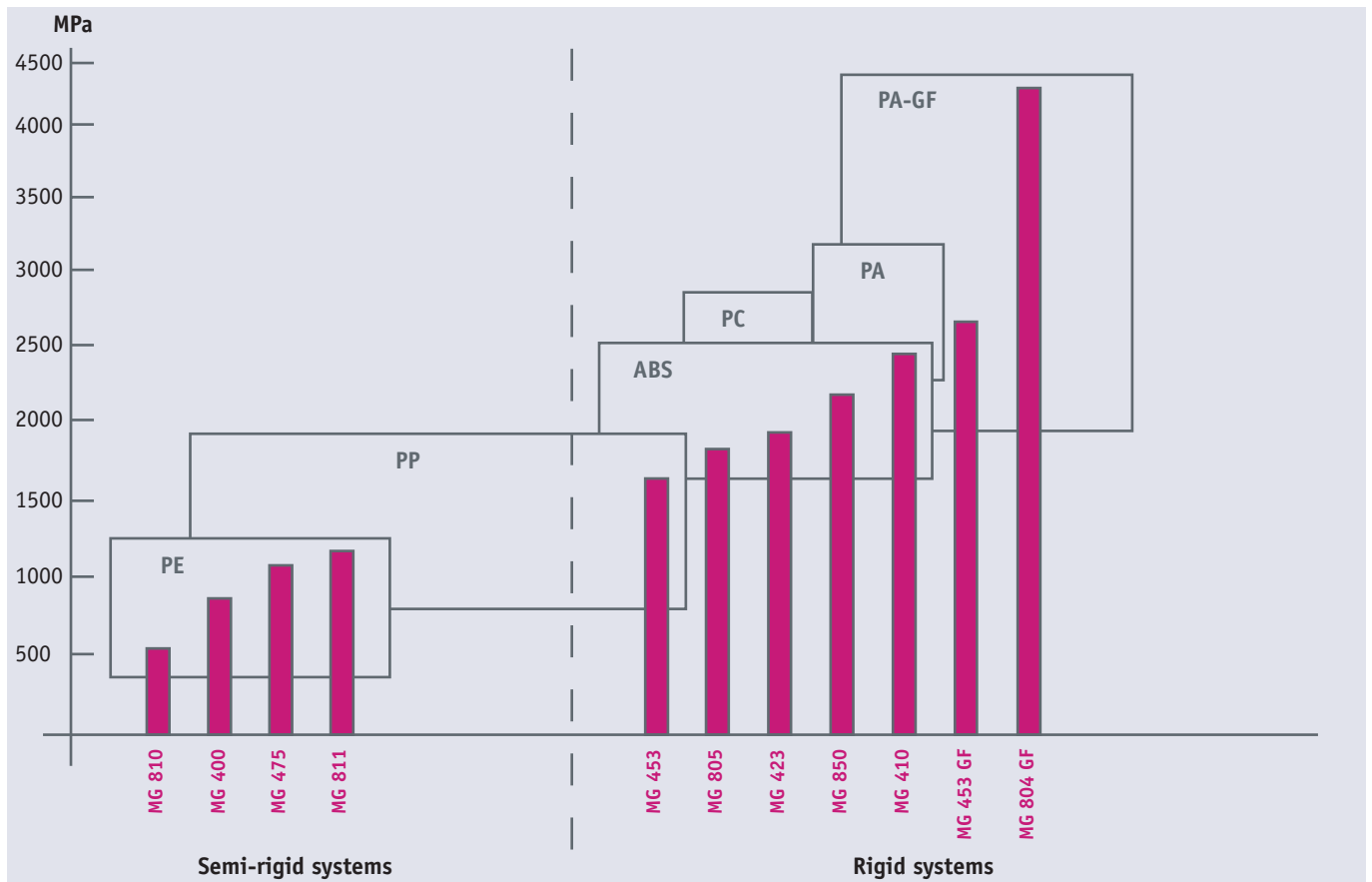


Parts production (Rapid Prototyping and Rapid Manufacturing)

Almost indistinguishable from the final product: properties profile for ebalta special resins

Increasingly shorter product life cycles, increasingly more complex components, increasingly shorter development times: the requirements in Rapid Prototyping and Rapid Manufacturing are high, and are getting higher. All the more important that the materials guarantee both fast and reliable processing. The **ebalta** resin systems fulfil the parameters you need for your serial components.

Flexural modulus of thermoplastic materials and ebalta PUR systems



Decoration object of MG 709

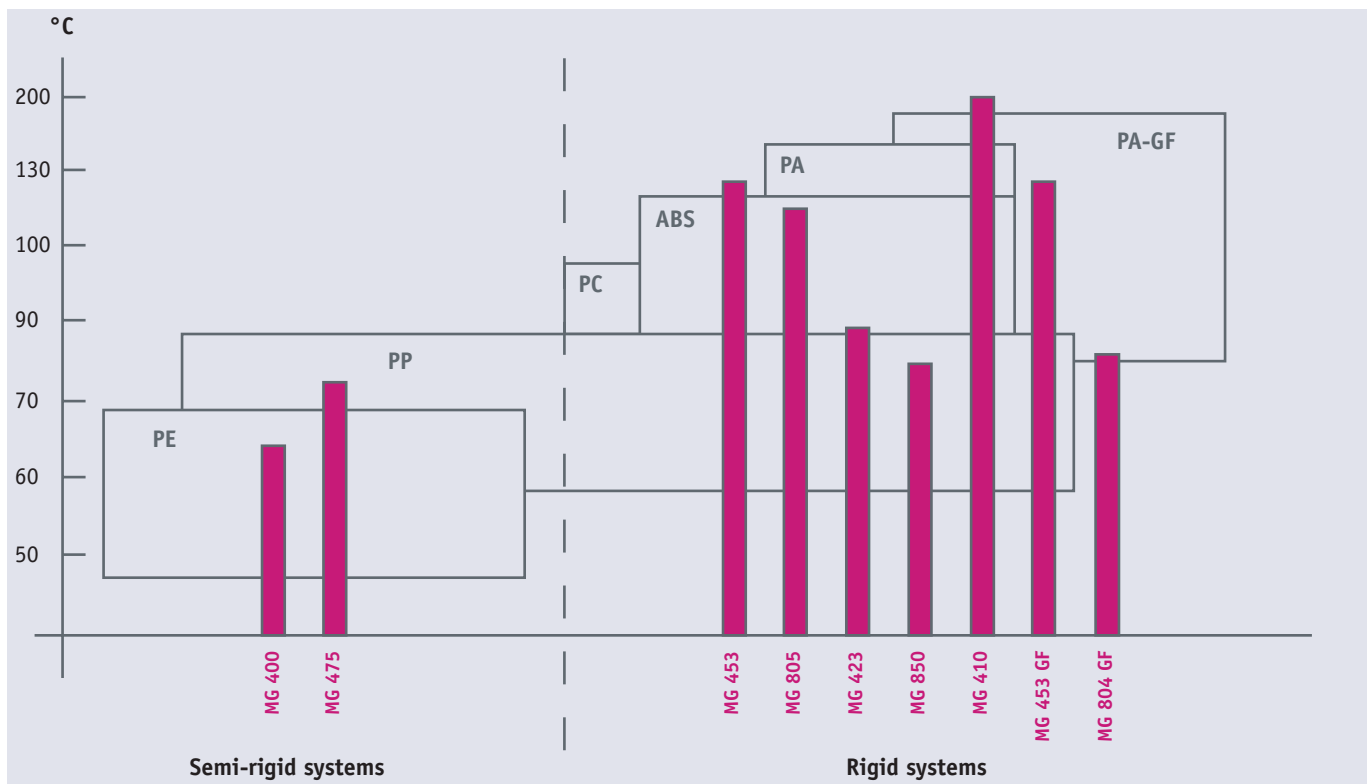


Functional component of MG 850 (dyed)

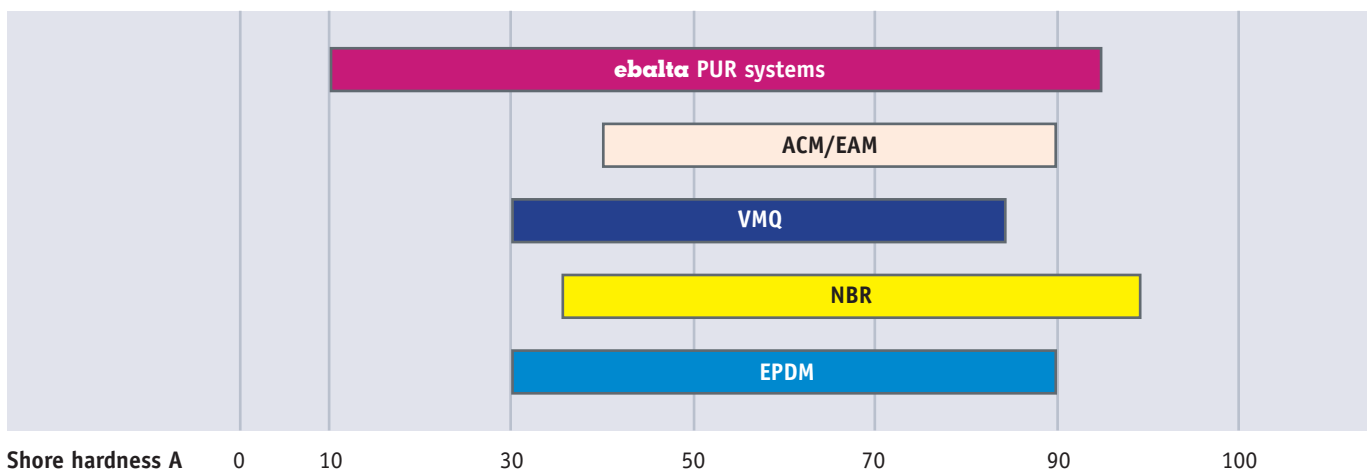
The higher the requirements, the more efficient the ebalta resin system

ebalta polyurethane resin systems are ideal for the simulation of a wide range of thermoplastic materials. They allow the fast, low-price and high-quality production of prototypes and job lot parts. The properties of serial materials (rubber, PE, PP, ABS, PC etc.) are simulated during development.

Temperature resistance of thermoplastic materials and ebalta PUR systems



Shore hardness of elastomers and ebalta PUR systems



Parts production (Rapid Prototyping and Rapid Manufacturing)

ebalta resin systems for low pressure (RIM)

The *ebalta* resin systems can be used in low pressure processes (*Reaction Injection Moulding*) to produce high-quality, complex components in the shortest of times. Short demoulding times also allow the production of low piece numbers. *ebalta* can offer a large product portfolio of resin systems for the manufacture of pilot lots, small and medium series.

	Resin	Properties	Color	Pot life 200 g/20 °C [sec.]	Flexural strength [MPa]	Flexural modulus [MPa]	Impact resistance (Charpy) [kJ/m ²]	Glass transition temperature (T _g) [°C]
Rigid	MG 125	similar to ABS	black beige	150-160	90 ± 10	2000 ± 150	45 ± 7	98
	MG 128	similar to ABS	black beige	360-420	112 ± 10	2750 ± 250	38 ± 7	100
	MG 423	similar to ABS	black	55-70	83 ± 8	1980 ± 200	53 ± 8	87
	MG 425	similar to PP	black beige	50-60	62 ± 6	1550 ± 150	80 ± 12	80
	MG 425 GF	similar to PA-GF	black	50-60	75 ± 5	2650 ± 250	35 ± 5	80
	MG 453	similar to PP	black	55-60	65 ± 1	1640 ± 50	38 ± 8	124
	MG 453 GF	similar to PA-GF	black	55-60	90 ± 2	2516 ± 56	18 ± 1.6	124
	MG 933	similar to ABS	black beige	240-300	80 ± 5	2000 ± 150	83 ± 10	84
Semi-rigid	MG 400	similar to PE	black beige	50-60	28 ± 2	630 ± 40	no breakage	65
	MG 475	similar to PP/PE	black beige	50-60	43 ± 3	1050 ± 75	no breakage	74
Elastic	GM 972	similar to rubber/EPDM 86 Shore A	beige	360-480	-	-	-	n. a.
	GM 973	similar to rubber/EPDM 90 Shore A	black beige	720-900	-	-	-	n. a.



ebalta vacuum casting resin systems

Vacuum casting is the preferred choice for components with complex geometries. Prototypes and low piece numbers can be manufactured from one tool. With **ebalta** polyurethane resin systems you can produce components with the properties of thermoplastic materials or elastomers.

	Resin	Properties	Color	Pot life 200 g/20 °C [min.]	Flexural strength [MPa]	Flexural modulus [MPa]	Impact resistance (Charpy) [kJ/m ²]	Glass transition temperature (T _g) [°C]
Rigid	MG 410	similar to ABS	ivory	3-5	76 ± 7	2450 ± 200	11 ± 3	200*
	MG 703	similar to PP/PE	white	8-12	52 ± 5	1340 ± 150	77 ± 20	105
	MG 707	similar to PP	white	8-12	63 ± 5	1500 ± 200	24 ± 10	120
	MG 709-9	similar to PC	transparent	8-12	68 ± 5	2150 ± 150	67 ± 10	-
	MG 804	similar to ABS	white black	10-13	90 ± 5	2270 ± 150	39 ± 6	82
	MG 804 GF	similar to PA-GF	white	7-9	85 ± 5	4400 ± 400	13 ± 2	82
	MG 805**	similar to ABS	black	5-7	93 ± 5	1870 ± 100	83 ± 15	122
	MG 805 GF	similar to PA-GF	black	6-8	87 ± 5	2510 ± 250	22 ± 6	122
	MG 850	similar to PC	transparent	8-10	87 ± 5	2220 ± 200	90 ± 15	80
Semi-rigid	MG 810	similar to PE	beige	15-17	23 ± 3	505 ± 80	no breakage	-
	MG 811	similar to PE	beige	11-12	90 ± 5	1150 ± 10	no breakage	-
Elastic	GM 900	similar to rubber/EPDM 10 Shore A	black beige	50-60	-	-	-	n. a.
	GM 951	similar to rubber/EPDM 47 Shore A	black beige	25-30	-	-	-	n. a.
	GM 972	similar to rubber/EPDM 86 Shore A	beige	6-8	-	-	-	n. a.
	GM 960	similar to rubber/EPDM 50 Shore A	transparent	20-30	-	-	-	n. a.

n. a. = not applicable

* Dimensional stability under heat (HDT) after DIN EN ISO 75

** Also available as system MG 805 FR with flame-retardant setting (tested according to DIN EN 60950 V0)

All data is provided as non-committal information and contains no guarantee of certain features or properties of the products.

Mould and tool making (Rapid Tooling)

ebalta mould making materials for low pressure (RIM)

The requirements of a RIM tool are lower than on a thermoplastic injection moulding tool. High-performance plastics thus offer many advantages in mould and tool making: very fast tool generation, faster changes to geometry, lower-priced materials and processing machines.

Production methods	Product recommendation	Hardener	Color	Material properties / Applications
Build-up method				
Surface layer	OH 4	SR	white	universal, very good to paint, easy to grind
	OH 35	CH-1	black	resistant to chemicals, can be polished and ground
	OH 16	Comp. B	light green	very abrasion resistant, hard elastic, very impact resistant
Coupling layer	KP 6	TGL	grey	improves adhesion between surface and substructure
Substructure Casting	GM 725-7	PUR 13	beige	thick pouring, high dimensional accuracy, good flow properties
	AH 100 + filler F-B AH 100 + alu grit	GL	yellow-transparent	favourable for large tools, good wetting properties
Substructure Laminating	AH 110	GLD	yellow-transparent	All-purpose resin with good impregnation properties, good curing
	PS 03	PS 03	blue	Laminate paste for geometries rich in contours, low weight
	ebacryl	EM	white	Acrylic resin emulsion, very fast, high dimensional accuracy
Casting method				
Solid casting	GM 725-7	PUR 13	beige	thick pouring, high dimensional accuracy, good flow properties
	GM 974	Comp. B	reddish-transparent	stable edges, highly recommended for loose parts or small tools
	SG 700	PUR 5	blue	for rapid moulding and small tools
Milling				
	ebablock® 140* ebaboard 140*		blue	low thermal expansion, very abrasion resistant, fine microstructure
	ebaboard PW 920*		green	easy to machine, good edge strength, high-quality surface

n. a. = not applicable

* We will be pleased to provide the relevant milling parameters depending on the material for optimum machining.

Variety of solutions for mould making

The high-performance **ebalta** products for tool production by the RIM method guarantee a perfect shape and long service life, be this a build-up method, casting method or milling. Together with the many years of experience of our experts you are bound to find the right product – your solution takes shape.

Pot life 200 g/20 °C [min.]	Curing time at RT [hrs.]	Heat resistance (Martens) [°C]	Compressive strength [MPa]
15-20	3-5	72 ± 3	100 ± 5
20-30	16-24	97 ± 3	105 ± 10
10-15	6-8	n. a.	n. a.
30-40	8-12	-	-
40-50	12-16	39 ± 2	76 ± 8
45-55	18-20	40 ± 2	84 ± 5
40-45	10-12	60 ± 2	97 ± 10
50-60	16-24	36 ± 2	45 ± 4
ca. 25	8-12	-	-
40-50	12-16	39 ± 2	76 ± 8
20-25	10-12	n. a.	n. a.
5-6	1-2	51 ± 2	60 ± 5
dimensions eblock® 140: dimensions variable	n. a.	85 ± 3	102 ± 5
dimensions eboard 140: 1000 x 500 x 50 mm 1000 x 500 x 75 mm 1000 x 500 x 100 mm			
dimensions: 1000 x 500 x 30 mm 1000 x 500 x 50 mm 1000 x 500 x 75 mm 1000 x 500 x 100 mm	n. a.	62 ± 2	56 ± 5

The aforementioned selection of products is not a generally applicable recommendation and can vary depending on the job in hand. Your Technical Sales Engineer will be pleased to offer advice on the right choice of products.

Mould and tool making (Rapid Tooling)

Silicones for vacuum casting

Complex virtual geometries can be quickly turned into 3D, tangible components with our mould making silicones. **ebalta** provides an extensive range of mould making silicones that can be individually adjusted according to the requirements profile.

		Color	Properties	Pot life at 23 °C [min.]	Shore hardness [Shore A]	Tensile strength [MPa]	Elongation at break [%]	Tear strength [N/mm]
HQA 40		translucent	very good demoulding, long life	approx. 90*	40	6.7	400	27

New range coming soon

Features of **ebalta** mould making silicones

- Dimensional accuracy
- Exact reproduction
- Easy processing
- Good tear strength



Form of **HQA 40**, component of **MG 805**



Tool of **HQA 40**, component of **MG 804**
Picture credits: Modellbau Robert Hofmann GmbH

Production ancillaries from ebalta

ebalta offers a complete range of various ancillaries for all phases of work during Rapid Prototyping, Rapid Manufacturing and Rapid Tooling. Developed specially for ebalta materials, this multi-faceted spectrum of products make it as easy as possible for you to handle our material.

<i>Release agent T 1-1</i> <i>Release agent T 03-1</i>	For release of component surfaces	Very short drying time High temperature resistance
<i>Pore sealer</i>	Primer for sealing porous surfaces	Fast drying Apply with brush or spray
<i>Casting system for eblock® 140 and eboard 140</i>	Two-component system for repairs to <i>ebaboard</i> and <i>ebablock®</i>	High strength Easy to process
<i>Fast-curing putty ebalta -lastic and eboard PW 920</i>	Two-component, fast-curing putty on a polyester basis	Easy to grind Excellent adhesion High filling strength
<i>Brushes</i>		
Flat brushes	10 / 20 / 30 mm	
Gussow brush	12 mm	
Gussow bristle brush	20 mm	
<i>Gloves</i>		
Latex gloves with / without powder	S / M / L / XL	
Vinyl gloves without powder	S / M / L / XL	
Nitrile gloves without powder	M / L / XL	
Cotton gloves	One size fits all	
<i>Mixing Cups</i>		
Plastic mixing cup	350 / 860 / 2100 ml	
Cardboard mixing cup	Small / Large	
<i>Plasticine (kneadable wax)</i>		
Superplasticine	Yellow	
Plasticine	Red	
	White	

tooling resins blocks ancillaries silicones

Rapid Prototyping

Mould and tool making

Design model making

Foundry tooling

Composites

Sheet metal forming

Electrical encapsulation

Further applications

If you have any questions concerning technical and production issues, please call us anytime to make an appointment with our experts.

ebalta UK Limited
B2 Langham Park, Trent Lane,
Castle Donington,
Derbyshire. DE74 2UT
t: +44 1332 814700
f: +44 1332 814775
e: info@ebalta.co.uk
w: www.ebalta.co.uk

ebalta Kunststoff GmbH
w: www.ebalta.de

ebalta
Solution takes shape