



Your partner for the
realisation of your ideas!

obomodulan® RenShape®

Boards, block materials and cast blocks
made of polyurethane for
model-, tool- and mould making





About OBO-Werke GmbH&Co KG:

We produce an extensive range of polyurethane (PU) boards. These are predominantly used in model construction, tool making and mould production. OBO-Werke also manufactures blanks, bonded or cast blocks and moulded products tailored to customer requirements. In addition to products bearing the obomodulan® name, it already produces PU boards under licence for Huntsman Advanced Materials and markets them internationally as RenShape®.

About VIBA:

Our partner VIBA is a leading, innovating technical trade company, operating in the Benelux. They offer the end user a wide and deep range of A-class products, expertise and know-how of applications. VIBA is a provider of solutions, knowledge and a relation network. VIBA's aim is to develop a strong long term business partnership with their customers that leads to success for both parties.

obomodulan® and Renshape®

In this brochure you find the various types and dimensions of boards, block materials and cast blocks made of polyurethane for model-, tool- and mould making.

Our advantages are:

- A comprehensive range of differing densities from 80 up to 1.600 kg/m³
- We have the largest range of standard board dimensions up to 2.000x1.000x200mm depending on type and density to optimize efficient use of our material.
- Cast blocks and mould casting
- Profile following bonded block constructions
- Full service programme offering cutting, bonding and machining of boards

obomodulan® and Renshape® convince by:

- homogeneous and smooth surfaces
- even, fine cell structure
- high edge strength
- low coefficient of thermal expansion
- free machining with low dust generation
- being generally recognized as physiologically neutral
- being odourless

OBO - Your partner for the realization of your ideas!

VIBA is our partner for the Benelux. If you have questions, or if you want a decent advise, please do not hesitate to contact VIBA by email: composites@viba.nl, or by telephone +31 (0)79 330 67 20 for The Netherlands.

For Belgium: email to: composites@viba.be and call +32 (0)3 866 11 32.

You will find more information on their website: www.viba.nl/composites

Best quality for diverse applications

By kind permission of:
Werk5 GmbH, Berlin



obomodulan® boards

standard types and -dimensions

technical data

measured average values, they are only limited suitable to determine specifications

Types	RenShape® BM-5108-1	obomodulan® 160	RenShape® BM-5025-1	obomodulan® 302
Colour	yellow	yellow	yellow	pink
Applications	<ul style="list-style-type: none"> • design studies • data control models • underconstruction for seamless modeling pastes 	<ul style="list-style-type: none"> • design studies • data control models • underconstruction for seamless modeling pastes 	<ul style="list-style-type: none"> • design studies • data control models • master models 	<ul style="list-style-type: none"> • design studies • laminating models • master models
Properties	<ul style="list-style-type: none"> • fine cell structure • easily shaped and machined • high deflection temperature up to 120°C 	<ul style="list-style-type: none"> • fine cell structure • easily shaped and machined • high deflection temperature up to 150°C 	<ul style="list-style-type: none"> • homogeneous and smooth surface • easily shaped and machined 	<ul style="list-style-type: none"> • homogeneous and smooth surface • easily shaped and Machined
Density approx. kg/m³	77-82	135-145	200	300
Compressive strength (DIN EN ISO 604) approx. MPa			2.6	5
Bending strength (DIN EN ISO 178) approx. MPa			3.3	7
Linear thermal expansion coefficient temperature from approx. 25 up to 70 °C (according to DIN 53752) 10⁻⁶ ·K⁻¹			50 – 55 (ISO 11359)	41
Shore-D (DIN 53505) Shore-D				28-45
Deflection temperature °C	120	150	80	80
Standard dimensions mm	2000x1000x200 2000x1000x420	2000x1000x200 2000x1000x420	2000x1000x200 2000x1000x420	1500x 500x 50 2000x 500x 50 2000x 1000x 50 1500x 500x 100 2000x 500x 100 2000x 1000x 100 1500x 500x 150 2000x 500x 150 2000x 1000x 150 1500x 500x 200 2000x 500x 200 2000x 1000x 200 other dimensions on request



obomodulan® and RenShape® boards standard types and -dimensions

RenShape® BM-5185	obomodulan® 500	RenShape® BM-6300	obomodulan® 652	obomodulan® 652 HT	RenShape® BM-5460	RenShape® BM-5055 (epoxy)	obomodulan® 750
orange	magma	mokka	mokka	terracotta	terra	light green	turquoise
<ul style="list-style-type: none"> design studies laminating models master models 	<ul style="list-style-type: none"> design studies laminating models master models 	<ul style="list-style-type: none"> design studies laminating models master models 	<ul style="list-style-type: none"> laminating models master models vacuum forming moulds foundry patterns 	<ul style="list-style-type: none"> laminating models master models vacuum forming moulds foundry patterns 	<ul style="list-style-type: none"> laminating models master models vacuum forming moulds foundry patterns 	<ul style="list-style-type: none"> lay up tools for pre-pregs high temperature applications vacuum forming moulds 	<ul style="list-style-type: none"> laminating models master models vacuum forming moulds foundry patterns
<ul style="list-style-type: none"> homogeneous and smooth surface easily shaped and machined 	<ul style="list-style-type: none"> homogeneous and smooth surface easily shaped and machined good dimensional stability 	<ul style="list-style-type: none"> fine cell structure easily shaped and machined 	<ul style="list-style-type: none"> fine cell structure easily machined 	<ul style="list-style-type: none"> high deflection temperature up to 120°C fine surface structure easily machined 	<ul style="list-style-type: none"> very fine surface structure easily machined 	<ul style="list-style-type: none"> high deflection temperature up to 140°C low coefficient of thermal expansion 	<ul style="list-style-type: none"> very fine surface structure easily machined
470	500	620	650	650	720	730	750
13	17	18	30	27	33	50-55	32
17	19	22	30	28	31	30-40	36
44	36	53	56	62	44	35-45 (ISO 11359)	59
40-50	47-63	46-56	60-70	58-67	61-70	75 (ISO 868)	60-72
95	80	80	80	120	80	140	100
1500x 500x 50 1500x 500x 75 1500x 500x 100 1500x 500x 150 1500x 500x 200	1500x 500x 50 2000x 500x 50 1500x 500x 50 1500x 500x 75 1500x 500x 100 1500x 500x 100 1500x 500x 100 1500x 500x 150 1500x 500x 200	1500x 500x 25 1500x 500x 50 1500x 500x 75 1500x 500x 75 1500x 500x 100 1500x 500x 150 1500x 500x 200	1500x 500x 50 2000x 500x 50 1500x 500x 75 1500x 500x 75 2000x 500x 75 1500x 500x 100 1500x 500x 100 1500x 500x 100 1500x 500x 150	1500x 500x 50 1500x 500x 75 1500x 500x 100 1500x 500x 100 1500x 500x 100 1500x 500x 100 1500x 500x 100 1500x 500x 150 1500x 500x 200	1500x 500x 25 1500x 500x 50 1500x 500x 75 1500x 500x 100 1500x 500x 100 1500x 500x 100 1500x 500x 100 1500x 500x 150 1500x 500x 200	1524x 610x 50 1524x 610x 100	1000x 500x 50 1500x 500x 50 2000x 500x 50 1000x 500x 75 1500x 500x 75 2000x 500x 75 1000x 500x 100 1500x 500x 100 2000x 500x 100 1500x 500x 100 1000x 500x 100 1500x 500x 100 2000x 500x 100 1500x 500x 150
other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request

Best quality for diverse applications



obomodulan® boards

standard types and -dimensions

technical data

measured average values, they are only limited suitable to determine specifications

Types	obomodulan® 850	RenShape® BM-5066	obomodulan® 1200	obomodulan® 1200
Colour	grey	creme	green	sahara
Applications	<ul style="list-style-type: none"> • laminating models • checking fixtures • vacuum forming moulds • foundry patterns 	<ul style="list-style-type: none"> • checking fixtures • pattern plates • core boxes 	<ul style="list-style-type: none"> • checking fixtures • core boxes • pattern plates 	<ul style="list-style-type: none"> • checking fixtures • foundry models • pressing tools • hammer form tools
Properties	<ul style="list-style-type: none"> • very fine surface structure • easily machined 	<ul style="list-style-type: none"> • very fine surface structure • easily machined 	<ul style="list-style-type: none"> • very fine surface structure • easily machined 	<ul style="list-style-type: none"> • very fine surface structure • easily machined
Density approx. kg/m³	820	950	1200	1200
Compressive strength (DIN EN ISO 604) approx. MPa	37	52	82	85
Bending strength (DIN EN ISO 178) approx. MPa	37	55	94	95
Linear thermal expansion coefficient temperature from approx. 25 up to 70 °C (according to DIN 53752) 10⁻⁶ ·K⁻¹	55	58	57	52
Shore-D (DIN 53505) Shore-D	65-75	70-76	81-85	82-85
Deflection temperature °C	100	90	80	90
Standard dimensions mm	1000x 500x 50 1500x 500x 50 2000x 500x 50 1000x 500x 75 1500x 500x 75 2000x 500x 75 1000x 500x 100 1500x 500x 100 2000x 500x 100 other dimensions on request	1500x 500x 50 1500x 500x 75 1500x 500x 100 other dimensions on request	1000x 500x 30 1500x 500x 30 1000x 500x 50 1500x 500x 50 2000x 500x 50 1000x 500x 75 1500x 500x 75 2000x 500x 75 1000x 1000x 75 1500x 500x 100 2000x 500x 100 1000x 500x 100 other dimensions on request	1000x 500x 50 2000x 500x 50 1000x 1000x 50 1000x 500x 75 2000x 500x 75 1000x 1000x 75 1000x 500x 100 2000x 500x 100 1000x 1000x 100 other dimensions on request



RenShape® BM-5173	RenShape® BM-5112-2	obomodulan® 1600	RenShape® BM-5166	obomodulan® 1700
blue	grey	grey	sand	black
<ul style="list-style-type: none"> • lay up tools • foundry models • core boxes • pattern plates <ul style="list-style-type: none"> • very fine surface structure • easily machined • high abrasion resistance 	<ul style="list-style-type: none"> • jigs • pattern plates <ul style="list-style-type: none"> • very fine surface structure • easily machined • very high compressive strength 	<ul style="list-style-type: none"> • jigs • thermoplastic deep drawing tools • vacuum forming moulds • pattern plates <ul style="list-style-type: none"> • high deflection temperature up to 120°C • low coefficient of thermal expansion • easily machined 	<ul style="list-style-type: none"> • jigs • pattern plates • pressing tools • hammer form tools <ul style="list-style-type: none"> • fine surface structure • easily machined • very high compressive strength • low coefficient of thermal expansion 	<ul style="list-style-type: none"> • jigs • pattern plates • pressing tools <ul style="list-style-type: none"> • fine surface structure • easily machined • very high compressive strength • low coefficient of thermal expansion
1200	1550	1600	1700	1600
94	100	94	90-100	116
100	100	65	55-65	75
76	62	43	45-50 (ISO 11359)	49
83-85	85	88	85-90 (ISO 868)	88-89
88	90	120	75-80	94
1000x 500x 25 1000x 500x 50 1500x 500x 50 1000x 500x 75 1500x 500x 75 1000x 500x 100 1500x 500x 100	750x 500x 50 1500x 500x 50 750x 500x 75 1500x 500x 75 750x 500x 100 1500x 500x 100	750x 500x 50 1500x 500x 50 750x 500x 75 1500x 500x 75 750x 500x 100 1500x 500x 100	750x 500x 50 1500x 500x 50 750x 500x 75 1500x 500x 100	750x 500x 50 1500x 500x 50 750x 500x 75 1500x 500x 100
other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request

By kind permission of Miele & Cie





Cut boards from horizontal saw

Beside the large variety of standard boards of obomodulan® and Renshape®, we offer you the following special service:

We cut boards starting at a thickness of 5 mm in every requested thickness with our horizontal saw. We surface calibrate the boards after cutting.

Your advantage:

- optimized dimension
- easier handling
- reduced milling time
- lesser material waste

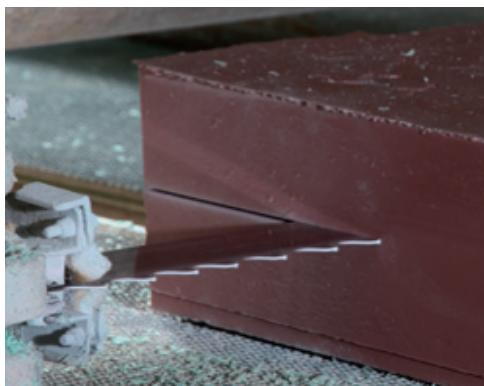
Bonding facility

You can have all obomodulan® and Renshape® standard types bonded according to your requirements with a bonding press.

We can provide blocks up to 6000 x 1700 x 800 mm, depending on type and weight. We are able to offer you the type 210 and 302 with a dimension up to 2000 x 1000 x 2000 mm.

We use a two component epoxy based adhesive. However, you may also use any other polyurethane, epoxy or polyester based adhesive of your choice. This procedure offers the following important advantages:

- **Bonded boards and block construction** of this facility give the highest level of stability during machining.
- **Minimal** and uniform glue lines
- **Time and cost saving** production and processing
- **Increased** efficient use of material



obomodulan® – machining data

Type	roughing cut	finishing cut, contour cut
1700	n = 10.000 - 12.000 1/min	n = 14.000 1/min
1600	v_f = 4.500 - 7.500 mm/min	v_f = 3.500 mm/min
1550	a_p = 3,0 - 6,0 mm	a_p = 0,2 - 0,3 mm
1500	carbide milling cutter	ball nose carbide milling cutter
1400	n = 8.000 - 15.000 1/min	n = 8.000 - 15.000 1/min
1200	v_f = 2.000 - 3.000 mm/min	v_f = 1.000 - 3.000 mm/min
1000	a_p = 1,0 - 3,0 mm	a_p = 0,2 - 0,5 mm
850	2 flute carbide milling cutter	2 flute ball nose carbide milling cutter
750	n = 8.000 - 15.000 1/min	n = 8.000 - 15.000 1/min
700	v_f = 2.000 - 3.000 mm/min	v_f = 1.000 - 3.000 mm/min
652	a_p = 3,0 - 5,0 mm	a_p = 0,2 - 0,5 mm
630	2 flute carbide milling cutter	2 flute ball nose carbide milling cutter
502		
500		

Key: **n**=spindle speed, **v_f**=feed rate, **a_p**=depth of cut

All mentioned data are recommended indicative values where OBO is achieving the best results.

According to the machine type, tool and work piece all parameter have to be proven by the persons in charge of machining.

The working values should not exceed the recommended max. values of the machine manufacturer.

Recommended Reference Data

Wood or plastic working machines

e.g. Carbide milling cutter

Diameter : 10 mm, face-cutting
 Speed : n = 2000 - 15000 rpm⁻¹
 Feed : v_f = 3 - 5 m/min
 Depth of cut : Roughing 10 - 15 mm
 Finishing up to max. 3 mm

High speed milling

e.g. Carbide milling cutter

Diameter : 20 mm,
 Radius R : = 10 mm
 Speed : n > 20000 rpm⁻¹
 Feed : v_f = 12 bis 15 m/min
 Cell spacing : 0,5 mm
 Depth of cut : 1 mm

Metal working machines

1.1 Roughing: Straight-shank milling cutter, carbide or HSS

Diameter : 25 - 40 mm
 Speed : n = 1500 - 2000 rpm⁻¹
 Feed : v_f = 2 - 3 m/min
 Depth of cut : 10-15 mm, up to 100 mm depth

1.2 Finishing: Carbide spherical cutter

a) Diameter	6 mm
Speed	: n = 3000 - 6000 rpm ⁻¹
Feed	: v _f = 0,8 - 2 m/min
b) Speed	: n = 2000 - 5000 rpm ⁻¹
Feed	: v _f = 1 - 2 m/min

General Remarks:

The cutting speed v = n x Jt d (m/min) should not exceed 250 m/min for HSS cutters and 1000 m/min for carbide cutters.
 Refer to and comply with the manufacturer's specifications.

Circular saw

For the sawing of obomodulan® 500 up to 1200 we recommend the following parameters:

- diameter of saw blade for boards of 100 up to 150 mm thickness: Ø 350 up to 450 mm
- 2800 up to 3000 rpm
- use proper wedge
- hard metal tipped saw blade with alternate tooth construction and medium tooth quantity
- please also observe any safety code regulations

All data relating to the material as well as machining and processing are provided to the best of our knowledge without obligation and should not be considered as an assurance of either material properties or as machining and processing options in individual cases.

obomodulan® Cast blocks / Close Contour Casting

We are able to offer you the cast blocks and the close contour casting for the following obomodulan® types:

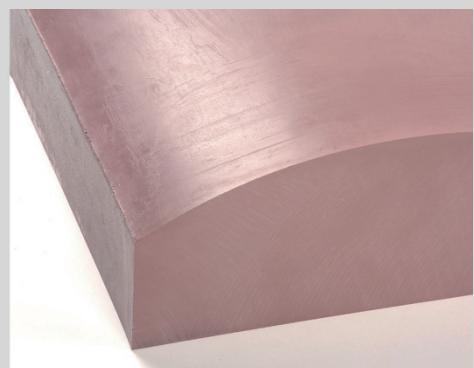
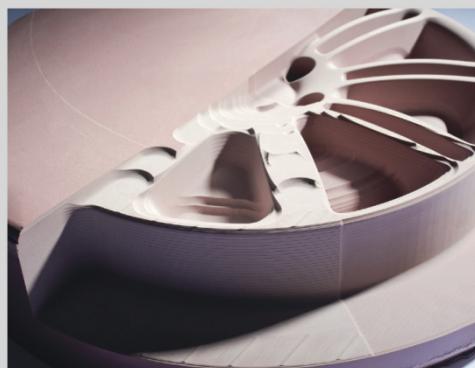
technical data

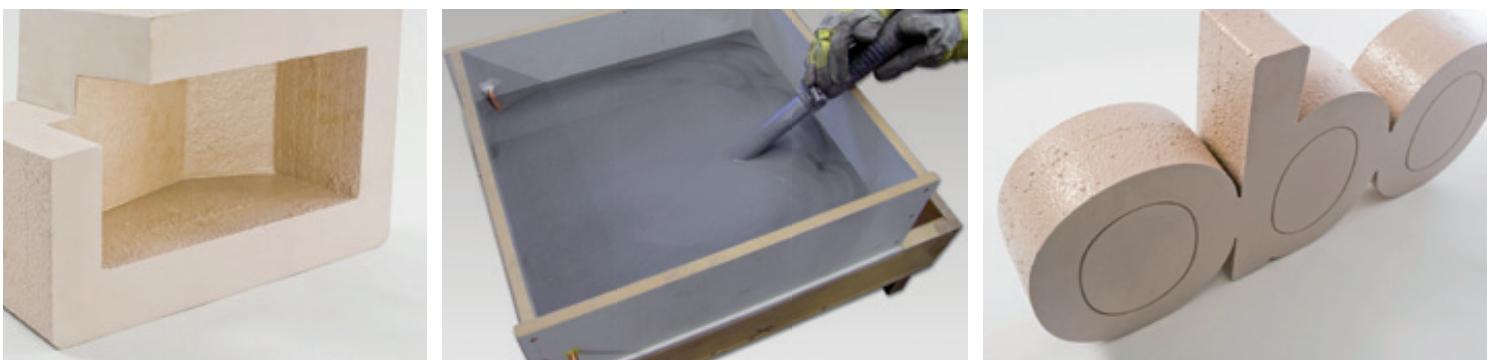
measured average values, they are only limited suitable to determine specifications

Advantages:

- our cast forms are produced using the identical formulation as our board material
- improved economic efficiency by reduced material consumption
- no glue lines
- profile following cast block
- reduced machining time by optimized shape

Types	700	1000	1200	1200	1400
Colour	terra	creme	green	sahara	blue
Applications	<ul style="list-style-type: none">• very fine surface structure• easily machined	<ul style="list-style-type: none">• very fine surface structure• easily machined	<ul style="list-style-type: none">• very fine surface structure• easily machined	<ul style="list-style-type: none">• very fine surface structure• easily machined	<ul style="list-style-type: none">• very fine surface structure• easily machined• high abrasion resistance
Density approx. kg/m³	720	950	1200	1200	1200
Compressive strength (DIN EN ISO 604) approx. MPa	33	52	82	85	94
Bending strength (DIN EN ISO 178) approx. MPa	31	55	94	95	100
Linear thermal expansion coefficient temperature from approx. 25 up to 70 °C (according to DIN 53752) 10⁻⁶ ·K⁻¹	44	58	57	52	76
Shore-D (DIN 53505) Shore-D	61-70	70-76	81-85	82-85	83-85
Deflection temperature °C	80	90	80	90	88





1550	1600	1700
grey	sand	black
<ul style="list-style-type: none"> • very fine surface structure • easily machined • very high compressive strength 	<ul style="list-style-type: none"> • fine surface structure • easily machined • very high compressive strength • low coefficient of thermal expansion 	<ul style="list-style-type: none"> • fine surface structure • easily machined • very high compressive strength • low coefficient of thermal expansion
1550	1600	1600
100	116	116
100	75	75
62	49	49
85	88-89	88-89
90	94	94

To meet your requirements we are able to offer obomodulan® in larger sized blocks or close contour cast blocks to optimize your costs through a reduction of time and raw material consumption. We are able to produce the mould tools within a short lead time.

Please send us your drawing or CAD data and we will competently expedite your request.

We deliver the cast blocks tempered with as cast surfaces. We are also able to mill one nominated side of the block in order that you can start with CNC milling straight away.

Our cast blocks are produced with the identical formulation as our production board materials

OBO-Werke GmbH & Co. KG



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VIBA is our partner in the Benelux and can help you with all questions about obomodulan® and Renshape® boards.

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