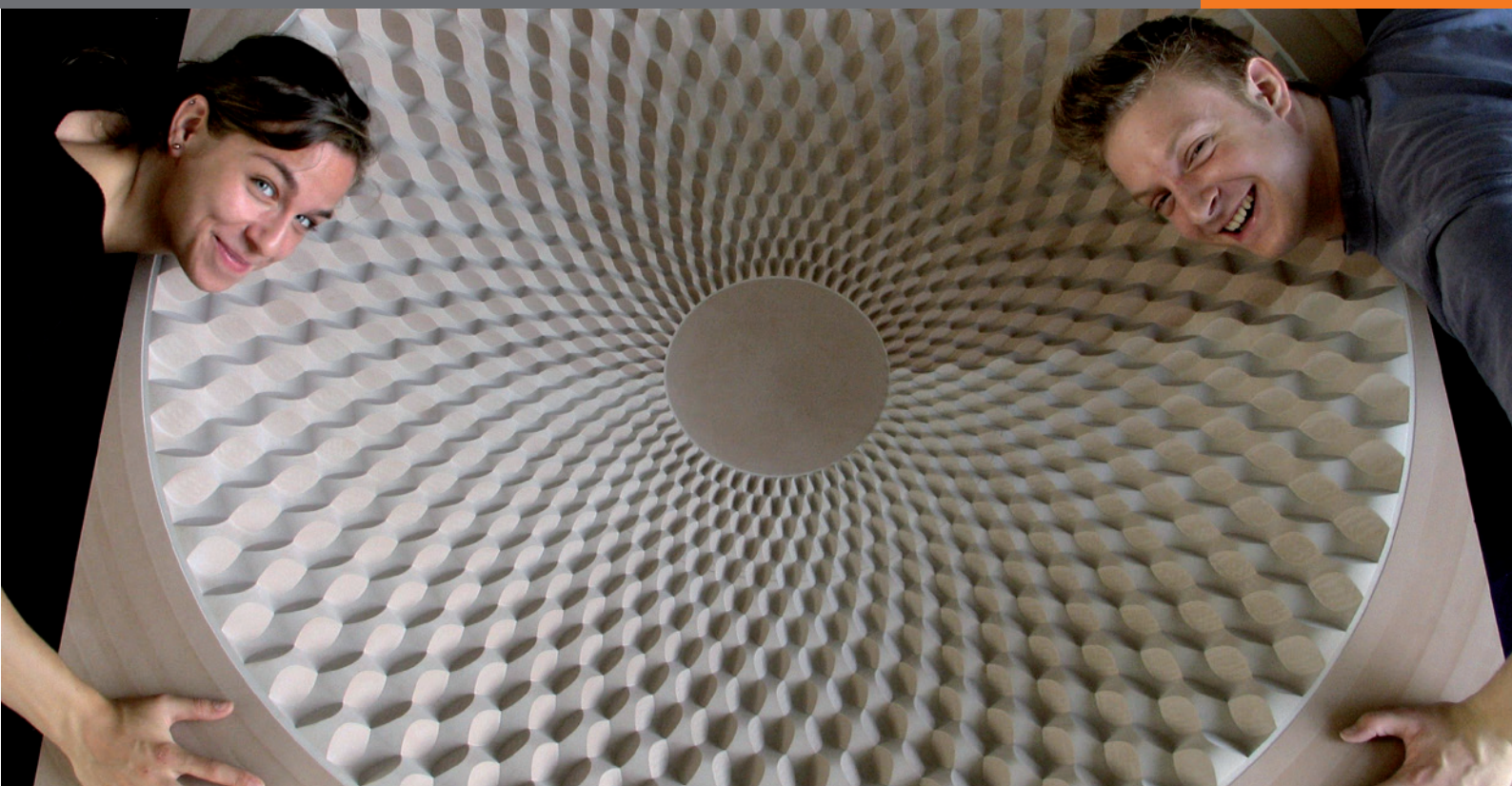




Your partner for the
realisation of your ideas!

obomodulan[®]

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



OBO-Werke GmbH: Your strong business partner

Since 1869 OBO: It was a long way from a sawmill for tropical timber to a supplier of a broad range of tooling products for model, tool and mould making.

Today we are your competent partner with a team of service oriented professionals for the implementation of your ideas. No matter if you are looking for standard blanks, glued blocks, close contour cast blocks, tooling resins and modelling pastes according to your requirements – individual solutions combined with flexible quantities are our strengths!

Please contact us. We will be happy to advise you of PU and Epoxy boards, modelling pastes and tooling liquids.

OBO-Werke GmbH: Facts and Figures

- established 1869 as sawmill for tropical timber

Development process:

- 1930th:
technical plywood for aviation industry
- 1950th:
manufacturing of school table tops, seatshells and well pipes
- 1970th:
manufacturing of impregnated compressed wood
- 1980th:
delivery of the first obomodulan® boards made of polyurethane
- since 2000th:
implementing further production facilities for PU.
Since 2003 subsidiary of MBB SE.
Since 2006 certified according to DIN EN ISO 9001 standard.
Employees: more than 80

We deliver: 100 % quality, 100 % service, 100 % flexibility





By kind permission of Miele & Cie KG, Gütersloh

obomodulan®

We develop and produce Model and Tooling boards, we also manufacture specially cast blocks of obomodulan® to our customers requirements.

More recently special applications have been realised from extraordinary ideas in addition to the well known such as - fences, sculptures and displays for exterior applications.

Our advantages are:

- a comprehensive range of differing densities from 80 up to 1600 kg/m³
- probably the largest range of standard board dimensions up to 2000 x 1000 x 420 mm 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

Properties

obomodulan® convinces 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

Best quality for diverse applications

By kind permission of:
Werk5 GmbH, Berlin



obomodulan® boards

standard types and -dimensions

technical data

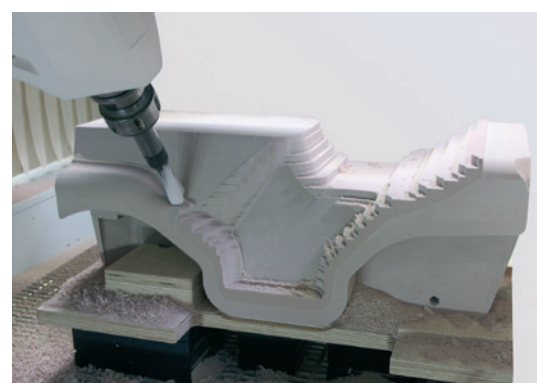
measured average values, they are only limited suitable to determine specifications

Types	80	210	240	302
Colour	yellow	light grey	mint	pink
Applications	<ul style="list-style-type: none">• design studies• data control models• underconstruction for seamless modelling pastes	<ul style="list-style-type: none">• design studies• data control models• master models	<ul style="list-style-type: none">• styling models• visualizing models• laminating models• thermoplastic deep drawing models• architectural 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">• homogeneous and smooth surface• easily shaped and machined	<ul style="list-style-type: none">• fine cell structure• easily machined• low dust	<ul style="list-style-type: none">• homogeneous and smooth surface• easily shaped and machined
Density approx. g/cm³	77-82	200	240	300
Compressive strength (DIN EN ISO 604) approx. MPa	Please ask for the technical data for this product seperately!	3	4	5
Bending strength (DIN EN ISO 178) approx. MPa		3	5	7
Linear thermal expansion coefficient temperature from approx. 25 up to 70 °C (according to DIN 53752) 10⁻⁶·K⁻¹		43	44	41
Shore-D (DIN 53505) Shore-D		18-25	23-31	28-45
Deflection temperature °C	120	80	90	80
Standard dimensions mm	2000 x1000 x200 2000 x1000 x420	1500 x 500 x100 2000 x 500 x100 2000 x1000 x100 2000 x 500 x150 2000 x1000 x150 2000 x 500 x200 2000 x1000 x200	2000 x 500 x100 2000 x1000 x100 2000 x 500 x150 2000 x1000 x150 2000 x 500 x200 2000 x1000 x200	1500 x 500 x 50 2000 x 500 x 50 2000 x1000 x 50 1500 x 500 x100 2000 x 500 x100 2000 x1000 x100 1500 x 500 x150 2000 x 500 x150 2000 x1000 x150 1500 x 500 x200 2000 x 500 x200 2000 x1000 x200
	other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request

Glue

We use two component epoxy based adhesive. However, you may also use any other Polyurethane,

The technical data relating to the material and its processing has been compiled carefully and is correct to the best of our knowledge. The information



400 orange	502 orange	500 magma	630 mokka	652 mokka	652 HT terracotta	700 terra	750 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"> • design studies • laminating models • master models 	<ul style="list-style-type: none"> • design studies • laminating models • master models • vacuum forming moulds • foundry patterns 	<ul style="list-style-type: none"> • laminating models • master models • vacuum forming moulds 	<ul style="list-style-type: none"> • design studies • 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"> • homogeneous and smooth surface • easily shaped and machined 	<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 • high edge resistance 	<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 • high edge resistance 	<ul style="list-style-type: none"> • very fine surface structure • easily machined
400	470	500	620	650	650	720	750
9	13	17	18	30	27	33	32
12	17	19	22	30	28	31	36
50	44	36	53	56	62	44	59
35-55	40-50	47-63	46-56	60-70	58-67	65-75	60-72
80	95	80	80	80	120	80	100
1500 x 500 x 50 1500 x 500 x 75 1500 x 500 x 100 1500 x 500 x 150	1500 x 500 x 50 2000 x 500 x 50 1500 x 500 x 75 2000 x 500 x 75 2000 x 500 x 100 1500 x 500 x 100 2000 x 500 x 100 1500 x 500 x 150 1500 x 500 x 200	1500 x 500 x 50 2000 x 500 x 50 1500 x 500 x 75 2000 x 500 x 75 2000 x 500 x 100 1500 x 500 x 100 2000 x 500 x 100 1500 x 500 x 150 1500 x 500 x 200	1500 x 500 x 25 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 2000 x 500 x 50 1500 x 500 x 75 2000 x 500 x 75 1500 x 500 x 100 2000 x 500 x 100 1500 x 500 x 150	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 25 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	1000 x 500 x 50 1500 x 500 x 50 2000 x 500 x 50 1000 x 500 x 75 1500 x 500 x 75 2000 x 500 x 75 1000 x 500 x 100 1500 x 500 x 100 2000 x 500 x 100 1500 x 500 x 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

epoxy or polyester based adhesive of your choice.

cannot, however, be taken to be legally binding nor as any commitment that the material has certain properties or is suited for any particular purpose.

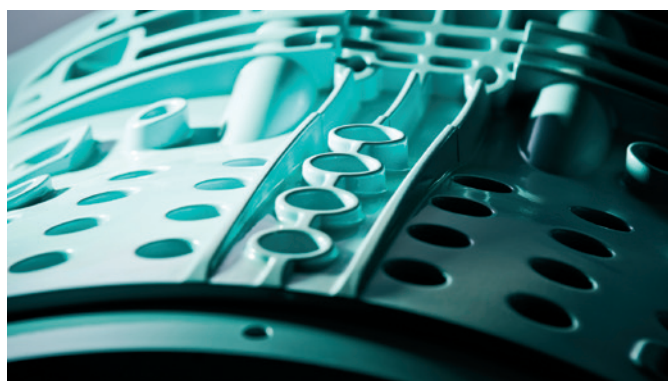
Best quality for diverse applications

obomodulan® boards

standard types and -dimensions

technical data

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

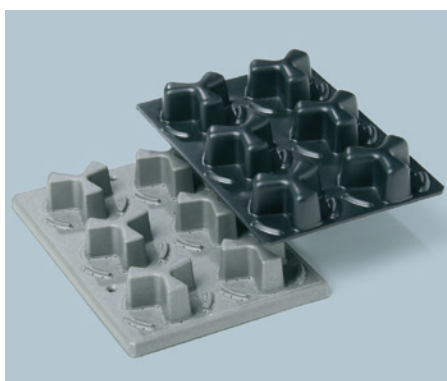


Types	850	1000	1200	1200
Colour	grey	creme	green	sahara
Applications	<ul style="list-style-type: none"> • laminating models • checking fixtures • vacuum forming moulds • foundry patterns 	<ul style="list-style-type: none"> • checking fixtures • pattern plates • core boxes 	<ul style="list-style-type: 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. g/cm^3	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) $10^{-6} \cdot \text{K}^{-1}$	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	1000 x 500 x 50 1500 x 500 x 50 2000 x 500 x 50 1000 x 500 x 75 1500 x 500 x 75 2000 x 500 x 75 1000 x 500 x 100 1500 x 500 x 100 2000 x 500 x 100 other dimensions on request	1500 x 500 x 50 1500 x 500 x 75 1500 x 500 x 100 other dimensions on request	1000 x 500 x 30 1500 x 500 x 30 1000 x 500 x 50 1500 x 500 x 50 2000 x 500 x 50 1000 x 500 x 75 1500 x 500 x 75 2000 x 500 x 75 1000 x 500 x 100 1500 x 500 x 100 2000 x 500 x 100 other dimensions on request	1000 x 500 x 50 2000 x 500 x 50 1000 x 1000 x 50 1000 x 500 x 75 2000 x 500 x 75 1000 x 1000 x 75 1000 x 500 x 100 2000 x 500 x 100 1000 x 1000 x 100 other dimensions on request

Glue

We use two component epoxy based adhesive. However, you may also use any other Polyurethane,

The technical data relating to the material and its processing has been compiled carefully and is correct to the best of our knowledge. The information



Epoxy

1400 blue	1550 grey	1600 grey	1600 sand	1700 black	RenShape® BM 5050 blue	RenShape® BM 5055 light green
<ul style="list-style-type: none"> • lay up tools • foundry models • core boxes • pattern plates 	<ul style="list-style-type: none"> • jigs • pattern plates 	<ul style="list-style-type: none"> • jigs • thermoplastic deep drawing tools • vacuum forming moulds • pattern plates 	<ul style="list-style-type: none"> • jigs • pattern plates • pressing tools • hammer form tools 	<ul style="list-style-type: none"> • jigs • pattern plates • pressing tools 	<ul style="list-style-type: none"> • prepregs • data control models • cubing • vacuum forming moulds 	<ul style="list-style-type: none"> • prepregs • data control models • cubing • vacuum forming moulds
<ul style="list-style-type: none"> • very fine surface structure • easily machined • high abrasion resistance 	<ul style="list-style-type: none"> • very fine surface structure • easily machined • very high compressive strength 	<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"> • 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 	<ul style="list-style-type: none"> • very fine surface structure • easily machinable • very good dimensional stability • high deflection temperature up to 110 °C 	<ul style="list-style-type: none"> • very fine surface structure • easily machinable • very good dimensional stability • high deflection temperature up to 140 °C
1200	1550	1600	1600	1600	700 – 750	720 – 750
94	100	94	116	116	60 – 65	50 – 55
100	100	65	75	75	35 – 40	30 – 40
76	62	43	49	49	35 – 40	35 – 45
83-85	85	88	88-89	88-89	72 – 78	67 – 75
88	90	120	94	94	105 – 110	135 – 140
1000 x 500 x 30 1500 x 500 x 30 1000 x 500 x 50 1500 x 500 x 50 1000 x 500 x 75 1500 x 500 x 75 1000 x 500 x 100 1500 x 500 x 100	750 x 500 x 50 1500 x 500 x 50 750 x 500 x 75 1500 x 500 x 75 750 x 500 x 100	750 x 500 x 50 1500 x 500 x 50 750 x 500 x 75 1500 x 500 x 75 750 x 500 x 100 1500 x 500 x 100	750 x 500 x 50 1500 x 500 x 50 750 x 500 x 75 750 x 500 x 100	750 x 500 x 50 1500 x 500 x 50 750 x 500 x 75 750 x 500 x 100	1524 x 610 x 50 1524 x 610 x 75 1524 x 610 x 100	1524 x 610 x 50 1524 x 610 x 75 1524 x 610 x 100
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

Bonding with:
RenGel® SW 18/Ren® HY 5159

Mix ratio: 100 : 16

Repair with:
original bonding material,
RenGel® SW 18/Ren® HY 5159

epoxy or polyester based adhesive of your choice.

cannot, however, be taken to be legally binding nor as any commitment that the material has certain properties or is suited for any particular purpose.

obomodulan® boards

Further Information

We deliver all standard boards tempered, trimmed and sanded.

Boards, finished tools and models should be stored flat in dry conditions at room temperature.

The material should be acclimatized to 18 - 25°C prior to machining. Temperature variations should be kept as moderate as possible.

Machining

We recommend the use of high speed CNC-machine centres and traditional wood and plastic working machines for the purpose of machining obomodulan®. In principle, traditional metal working machines are also suitable for this purpose.

Carbide milling cutters should be used for machining purposes. Solid carbide for small milling cutters and reversible carbide tips for larger cutter diameters. The cutting edge geometry is identical to that used for machining aluminium.

On request we also manufacture cut to size or special dimensions according to your drawing or sketch.

Beside our CNC machines we have other machines for special machining in house. Please ask us and we are pleased to make you an offer.

We can send you the detailed machining processing information by fax or email.



Cut boards from horizontal saw

Beside our large variety of standard boards 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

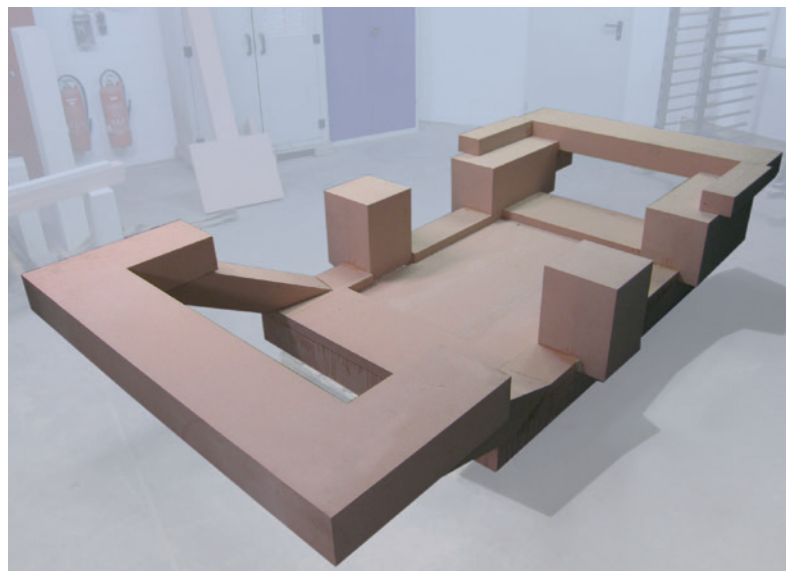
You can have all obomodulan® standard types bonded according to your requirements with our bonding press.

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® Cast blocks / Close Contour Casting

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

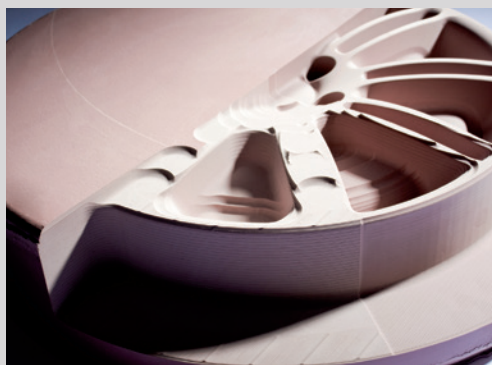
technical data

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	1550
Colour	terra	creme	green	sahara	grey
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 	<ul style="list-style-type: none"> • very fine surface structure • easily machined • very high compressive strength
Density approx. g/cm ³	720	950	1200	1200	1550
Compressive strength (DIN EN ISO 604) approx. MPa	33	52	82	85	100
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	62
Shore-D (DIN 53505) Shore-D	65-75	70-76	81-85	82-85	85
Deflection temperature °C	80	90	80	90	90

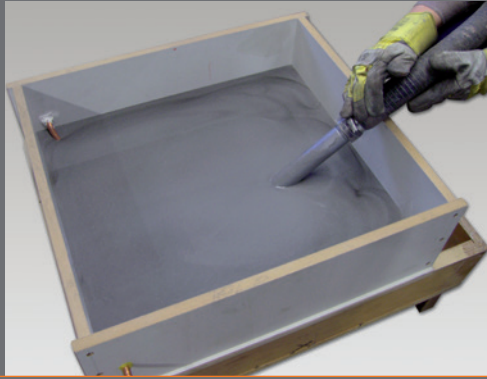


The technical data relating to the material and its processing has been compiled carefully and is correct to the best of our knowledge. The information cannot, however, be taken to be legally binding nor as any commitment that the material has certain properties or is suited for any particular purpose.

Cast block with removable core and taper of mould



Casting in a special mould



Individual cast block



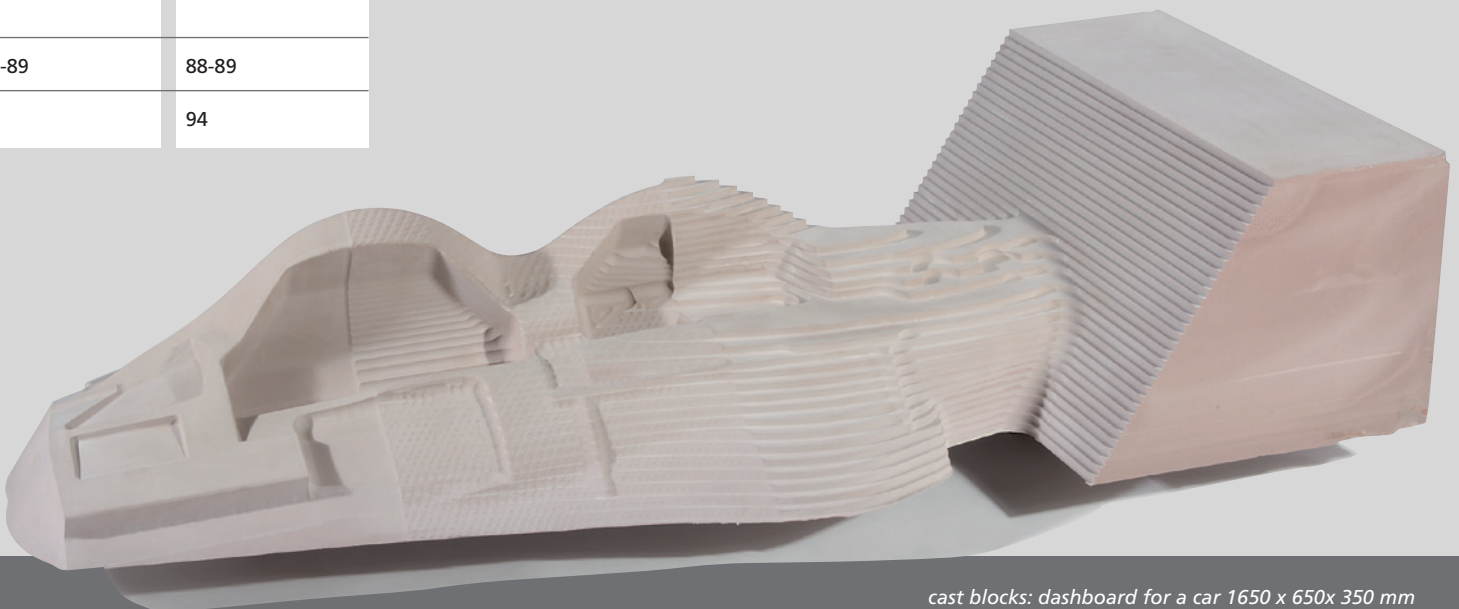
To meet your requirements we are able to offer obomodulan® in larger sized blocks or close contour cast blocks to optimize your costs through a reduction of time and raw material consumption. We are able to produce the mould tools within a short lead time.

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.

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



cast blocks: dashboard for a car 1650 x 650x 350 mm

OBO-Werke GmbH



obo®

Office:

Am Bahnhof 5
31655 Stadthagen
Germany

phone ++49/5721/7801-0

fax ++49/5721/77855

Business hours:

Monday until Thursday

08:00 a.m. until 04:00 p.m.

Friday 08:00 a.m. until 02:00 p.m.

email: info@obo-werke.de

www.obo-werke.de

Pick up address / warehouse:

Werk I
Nordstraße
31655 Stadthagen
Germany

phone ++49/5721/7801-67

fax ++49/5721/7801-77

Business hours:

Monday until Friday

07:00 a.m. until 01:30 p.m.

Further Information

You can obtain the following information by fax or email:

- machining data
- material safety data sheets
- information to individual applications:
 - » cast blocks / mould casting
 - » thermoforming
 - » injection mould tooling
 - » sheet metal pressing

Your sales distributor:

OBO-Werke GmbH manufacture
RenShape® boards and RenPaste™
seamless modelling paste under
License from Huntsman Advanced
Materials (Switzerland) GmbH.

edition: August 2016

