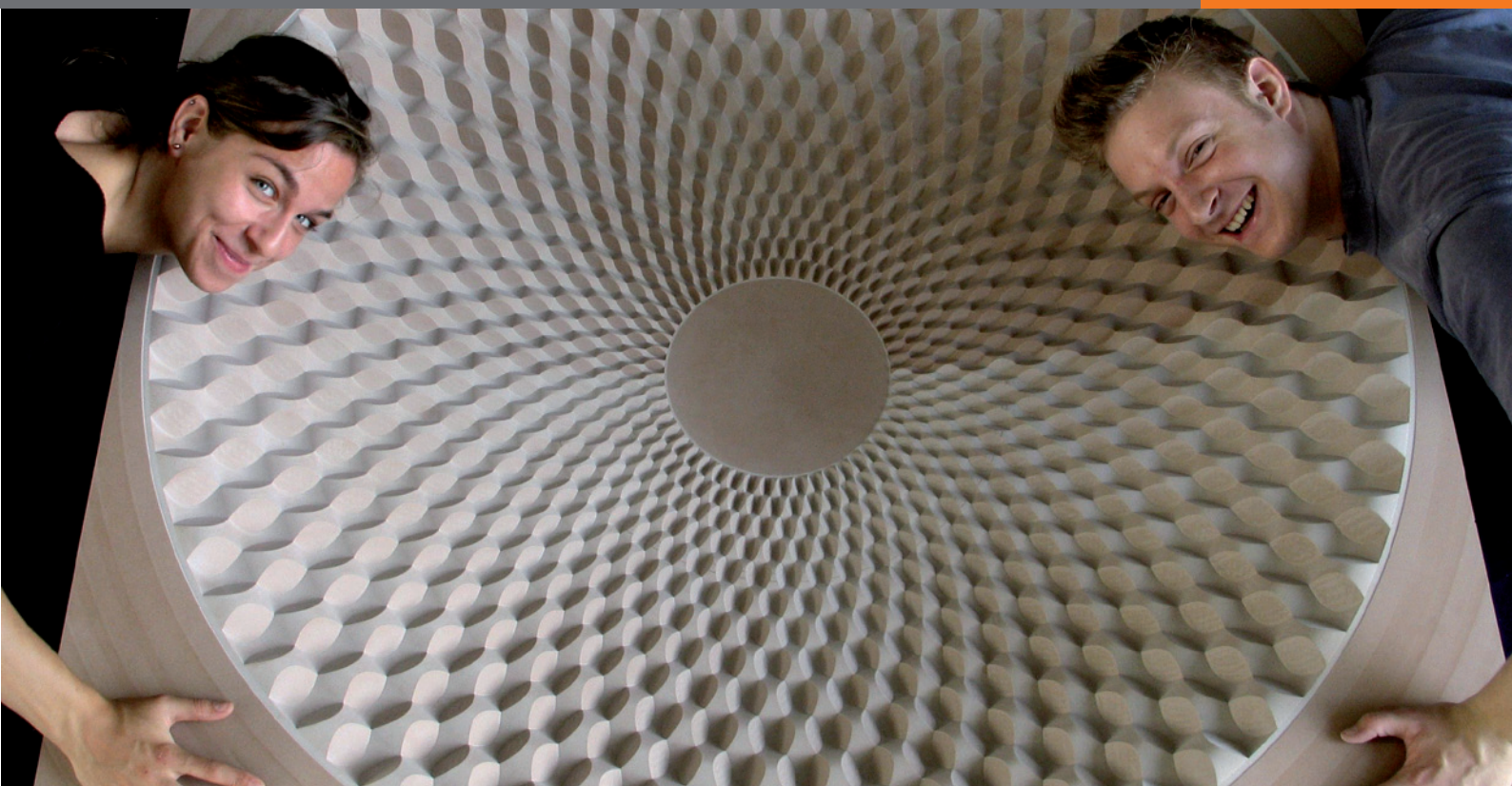




Your partner for the
realisation of your ideas!

obomodulan[®]

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





By kind permission of Miele & Cie KG, Gütersloh

The company

OBO-Werke GmbH & Co. KG was established in 1994, although the success story began with the company Otto Bosse in 1869.

From the beginning OBO has been located in Stadthagen where for more than 140 years the business has excelled in the manufacture of wood based laminate materials, for example obo-Festholz®, obo- Multi-

plex and special plywood and in more recent years obomodulan®.

In the mid 80's the first obomodulan® boards were supplied in Germany. What started from two grades, has developed over the years to a large comprehensive product range.

The OBO-Werke GmbH & Co. KG is part of the MBB Industries AG.

Certification

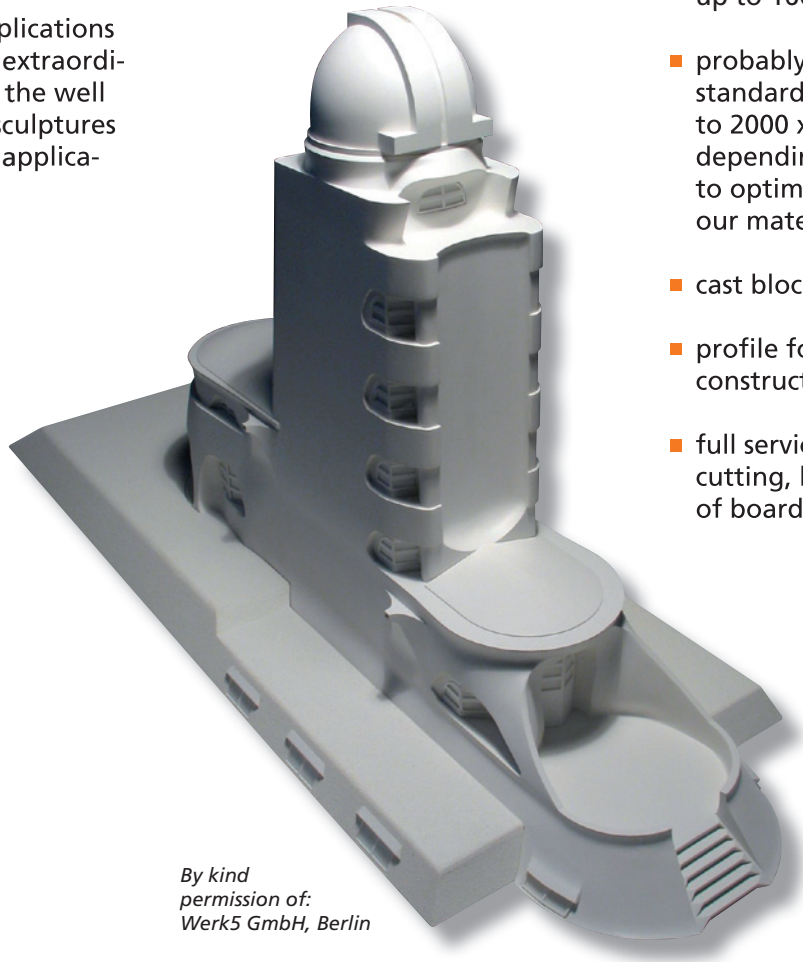
OBO-Werke GmbH & Co. KG are certified according to DIN EN ISO 9001:2008.

Our production process and the products are under continuous inspection and approval.

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.



By kind permission of:
Werk5 GmbH, Berlin

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 200 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

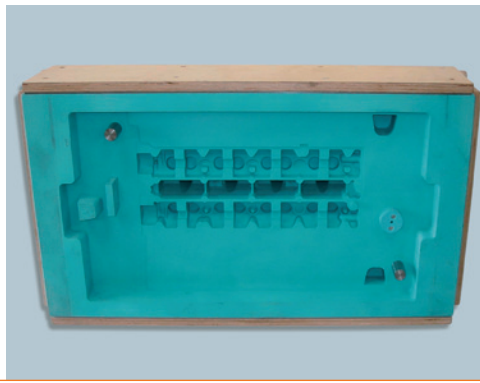
measured average values, they are only limited suitable to determine specifications

Types	80	160	210	302
Colour	yellow	yellow	light grey	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	Please ask for the technical data for this product seperately!		3	5
Bending strength (DIN EN ISO 178) approx. MPa	Please ask for the technical data for this product seperately!		3	7
Linear thermal expansion coefficient temperature from approx. 25 up to 70 °C (according to DIN 53752) 10⁻⁶ · K⁻¹	Please ask for the technical data for this product seperately!		43	41
Shore-D (DIN 53505) Shore-D	Please ask for the technical data for this product seperately!		18-25	28-45
Deflection temperature °C	120	150	80	80
Standard dimensions mm	2000x1000x200 2000x1000x420	2000x1000x200 2000x1000x420	1500x 500x100 2000x 500x100 2000x1000x100 2000x 500x150 2000x1000x150 2000x 500x200 2000x1000x200	1500x 500x 50 2000x 500x 50 2000x1000x 50 1500x 500x 100 2000x 500x 100 2000x1000x100 1500x 500x 150 2000x 500x 150 2000x1000x150 1500x 500x 200 2000x 500x 200 2000x1000x200
	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



502	500	630	652	652 HT	700	710	750
orange	magma	mokka	mokka	terracotta	terra	light blue	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 vaccum forming moulds foundry patterns 	<ul style="list-style-type: none"> laminating models master models vaccum forming moulds 	<ul style="list-style-type: none"> laminating models master models vaccum forming moulds foundry patterns 	<ul style="list-style-type: none"> lay up tools for pre-pregs high temperature applications vaccum forming moulds 	<ul style="list-style-type: none"> laminating models master models vaccum 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	700	750
13	17	18	30	27	33	50	32
17	19	22	30	28	31	30	36
44	36	53	56	62	44	30	59
40-50	47-63	46-56	60-70	58-67	61-70	68	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 75 2000x 500x 75 1500x 500x 100 2000x 500x 100 1500x 500x 150 2000x 500x 150 1500x 500x 200	1500x 500x 25 1500x 500x 50 1500x 500x 75 1500x 500x 100 1500x 500x 150 1500x 500x 200	1500x 500x 50 2000x 500x 50 1500x 500x 75 2000x 500x 75 1500x 500x 100 2000x 500x 100 1500x 500x 150	1500x 500x 50 1500x 500x 75 1500x 500x 100	1500x 500x 25 1500x 500x 50 1500x 500x 75 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 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 typs 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 • vaccum 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 500x 100 1500x 500x 100 2000x 500x 100 other dimensions on request	1000x 500x 50 2000x 500x 50 1000x1000x 50 1000x 500x 75 2000x 500x 75 1000x1000x 75 1000x 500x100 2000x 500x100 1000x1000x100 other dimensions on request

Glue

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

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1400	1550	1600	1600	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"> • 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"> • 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
1200	1550	1600	1600	1600
94	100	94	116	116
100	100	65	75	75
76	62	43	49	49
83-85	85	88	88-89	88-89
88	90	120	94	94
1000x 500x 30 1500x 500x 30 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	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 750x 500x 100	750x 500x 50 1500x 500x 50 750x 500x 75 750x 500x 100
other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request	other dimensions on request

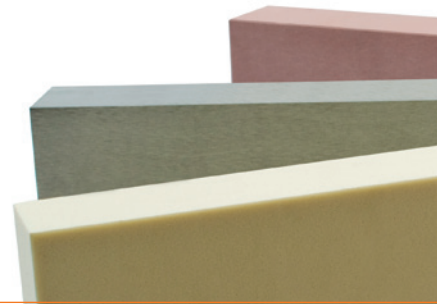
By kind permission of Miele & Cie KG, Gütersloh



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

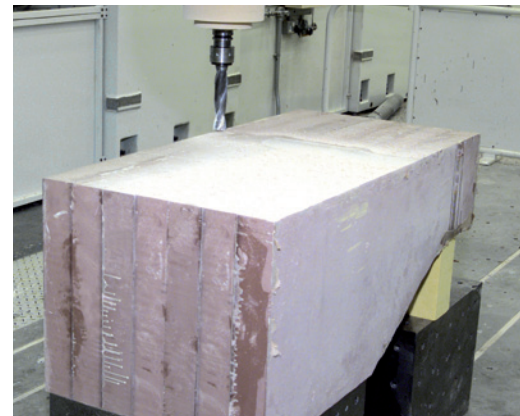
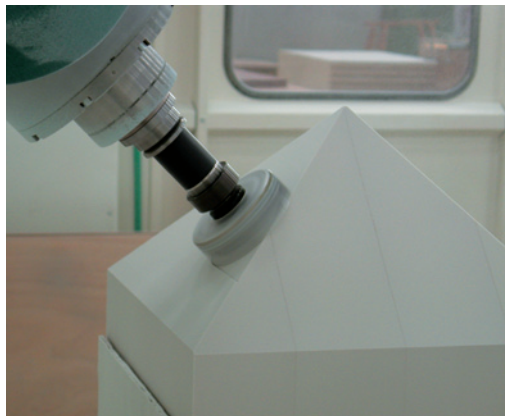
We recommend the use of high speed CNC-machine centres and traditional wood and plastic working machines for the purpose of machining obomodulan®. In principle, traditional metal working machines are also suitable for this purpose.

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

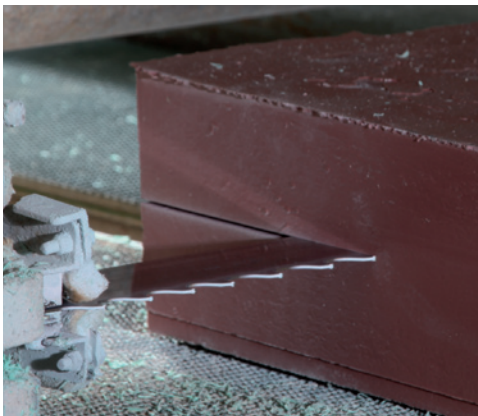
Bonding facility

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:

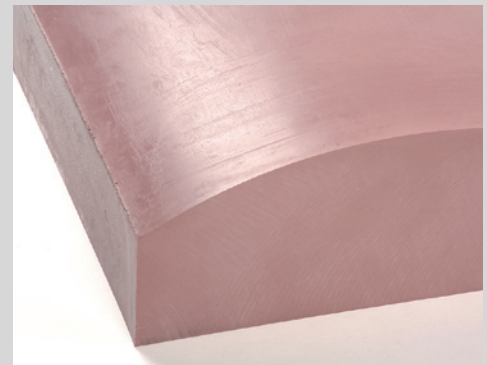
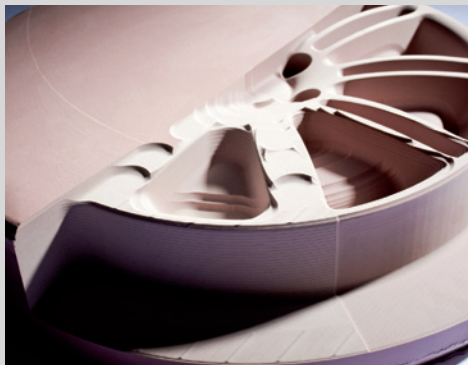
technical data

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	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



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.

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



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

OBO-Werke GmbH & Co. KG

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D-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:
Nordstraße
D-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

edition: November 2013

