

premium

Laboratory Benchtops Made of Technical Ceramics





Legal notice

Details of our products are based on the results of extensive development and the associated test findings. Many years of experience in the most varied fields of application provide an additional guarantee for the durability of FRIDURIT Technical Ceramics. The user, however, remains responsible for verifying our information and recommendations on the basis of his individual requirements and, if necessary, for confirming suitability of the product for his application by means of independent tests.

Our technical specifications are based on DIN EN 12915 and DIN EN 14879-6.
We reserve the right to make technical changes.





Introduction	
Quality in the Laboratory	4
Perfection with FRIDURIT	
FRIDURIT Technical Ceramics	5
Laboratory Benchtops	
Benchtops for Wall and Island Benches	6
Benchtops for Fume Cupboards	7
Marine Edge	8
Design Examples	9
Adjustment to Structural Conditions	10
Glaze Colours	11
Laboratory Sinks	
Sinks	12
Cup Sinks - Oval	13
Cup Sinks - Round	14
P-Trap	15
Technology	
Cutting Signs	16
Edge Profiles	17
Apertures and Bores	18
Drainage Grooves	19
Corner Solutions	19
Mounting Instructions for Benchtops	
Mounting	20
Joint Sealing	20
Mounting Instructions for Laboratory Sinks	
Installation Options	21
General Product Information	22
Material Properties	23

This together with further documents such as specifications and certificates are available in electronic form at www.friatec.com.

Introduction



Figure 1
Island bench with head-end sink unit



Figure 2
Wall bench



Figure 3
Fume cupboards with FRIDURIT fume scrubber and neutralisation unit

Quality in the Laboratory

Quality demands set by modern laboratories increase side by side with the requirements and standards to which products and services are subjected. This applies to the same degree to the environment in which tests, analyses and experiments are carried out. This is where laboratory work surfaces make a substantial contribution if they can be kept intact, clean and in a hygienic condition. Such laboratory environments support high-quality work processes, or even create in the first place the basic conditions necessary for this. It thus follows that the condition of laboratory work surfaces is decisive for the impression made by the laboratory as a whole.

Perfection with FRIDURIT

FRIDURIT full-size laboratory benchtops and sinks made of Technical Ceramics have been used for many years in a wide variety of laboratory applications. With its pore-free surface FRIDURIT Technical Ceramics offers a unique combination of chemical resistance, scratch resistance and thermal stability. This property profile makes it possible to maintain permanently the perfect working environment. Even after many years of intensive use FRIDURIT laboratory benchtops still look just like new.

Each FRIDURIT premium laboratory benchtop made of Technical Ceramics is manufactured individually and is supplied ready for mounting. An integrated ceramic marine edge provides protection from liquid overspill. All worktops are self-supporting and require no additional sub-structure so that they can be mounted directly onto the base unit. Four-point support is sufficient.

FRIDURIT laboratory sinks made of Technical Ceramics can be integrated just where access to water is required.

Choose from a wide range of glaze colours and plan your work surface exactly in line with your own requirements.

Our experience in manufacturing ceramic benchtops and sinks is your guarantee for highest quality combined with flexible design.

FRIDURIT Technical Ceramics

Work surfaces in the laboratory are exposed to extreme stresses. FRIDURIT Technical Ceramics products are tuned optimally to the work processes in your laboratory and withstand all strains and stresses. FRIDURIT laboratory benchtops and sinks stay just like new, even when permanently subjected to chemicals and extreme thermal or mechanical stresses such as scratching, scouring and cleaning processes.

Technical Ceramics - Natural material of a very special kind:

- **easy to clean**

FRIDURIT laboratory benchtops made of Technical Ceramics pose no problems in terms of cleaning. Whether soiled by dyes, varnishes, dirt or grease - they can all be removed without trace. Thanks to their extreme hardness and abrasion resistance our Technical Ceramics products remain totally unaffected, even after undergoing repeated cleaning with aggressive cleaning agents and tools.

- **resistant to chemicals**

FRIDURIT Technical Ceramics products are fully resistant to solvents and chemicals commonly used in the laboratory, e.g. aqua regia, hydrochloric acid, sulphuric acid, nitric acid and sodium hydroxide, even when used at high concentrations and temperatures and with a long reaction time.

- **microbiologically pure**

FRIDURIT laboratory benchtops can be decontaminated and disinfected. Their permanently sealed surfaces preclude breeding grounds for viruses, bacteria or germs.

- **scratch resistant**

FRIDURIT laboratory benchtops always look as good as new. Their extremely high scratch-resistance (Mohs Hardness Scale 7) prevents all trace of use.

- **heat resistant**

FRIDURIT Technical Ceramics is resistant to heat from open flames and hot objects up to temperatures of 500 degrees Celsius. It is non-flammable and completely fire-proof.

- **environmentally compatible**

FRIDURIT Technical Ceramics is manufactured purely and simply from natural earth resources, such as clay, kaolin and feldspar. Such material, which contains no chemical substances, poses no problems in terms of recycling. FRIDURIT Technical Ceramics is thus a classic example of "green" building materials, which represent an important element in implementing "Green Building" concepts. These concepts (e.g. LEED, BREEAM) increase resource efficiency in buildings while at the same time reducing damaging effects on both health and the environment. Laboratory staff are thus active in a working environment that is free of emissions and thoroughly safe. FRIDURIT Technical Ceramics is non-flammable (Euroclass A1) and does not increase the fire load of buildings. The FRIDURIT Technical Ceramics manufacturing process takes place in accordance with ISO standards for general process management (DIN EN ISO 9001 ff.) as well as those regarding adherence to environmental aspects (DIN EN ISO 14001). Sustained development and viability is the maxim for using FRIDURIT Laboratory Technology. This is why we are also a member of EGNATON – the European Association for Sustainable Laboratory Technologies

We will be happy to provide you with further information on this material.

Laboratory Benchtops

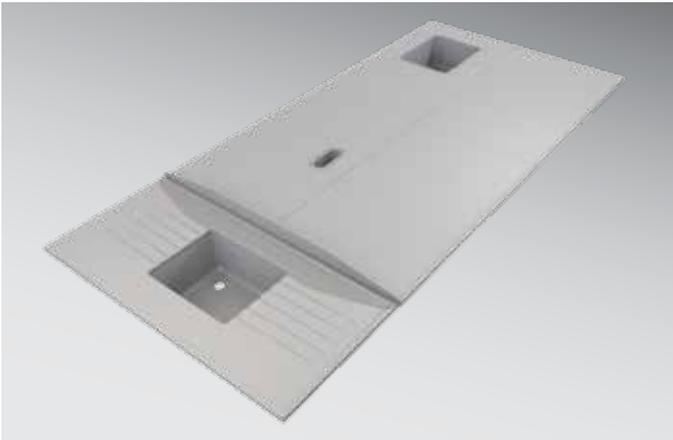


Figure 4
Example of an island bench with head-end sink unit ¹
¹ *Splash guard not included*

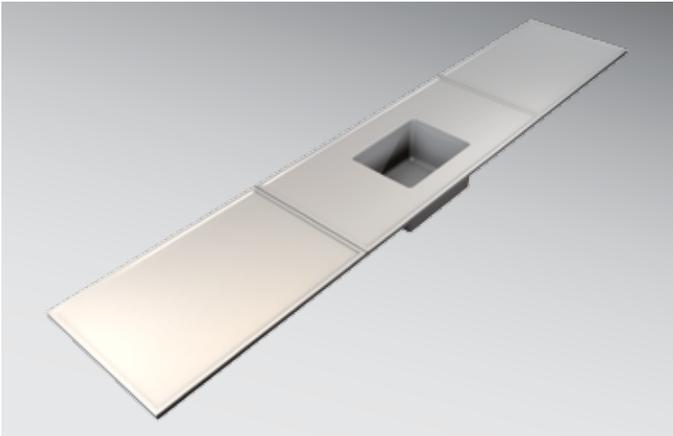


Figure 5
Example of a wall bench solution

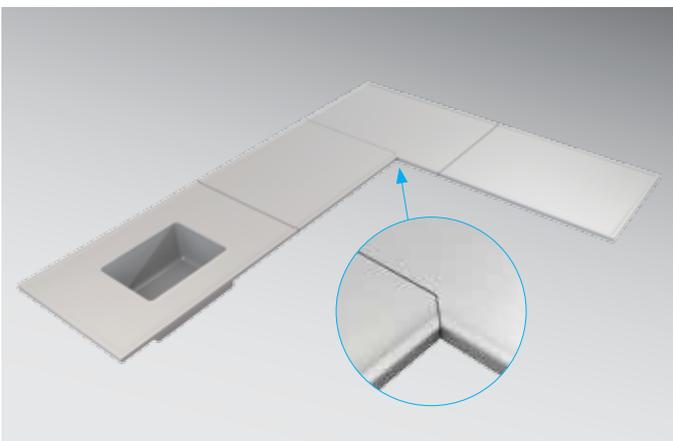


Figure 6
Example of a wall bench corner solution

Benchtops for Wall and Island Benches

FRIDURIT premium laboratory benchtops can be combined to wall-fitted laboratory workplaces or to free-standing island bench units. The maximum dimensions of a worktop are 900 x 2000 mm. Within this maximum range individual worktop dimensions can be selected freely. Appropriate adjustments to the substructure fittings result in an attractive joint finish. The circumferential marine edge means that a closed benchtop arrangement of any length is possible. Benchtop arrangements in combination with other materials can also be implemented according to your individual requirements.

Laboratory sinks can be integrated just where they are needed. They can be top-mounted, flush-mounted or under-fixed. The joint-free marine edge formed onto the benchtop prevents any liquid overspill from the sink area to the adjacent working area.

Benchtops for Fume Cupboards

Due to their exceptional degree of chemical, thermal and mechanical durability FRIDURIT premium laboratory benchtops provide the ideal work surface, especially in the fume cupboard area.

The joint-free, 7 mm high marine edge provides full protection from liquid overspill. In addition, an aerodynamically formed front edge can positively influence air conduction in the fume cupboard.

The geometry of the worktop can be perfectly adjusted to fume cupboard dimensions. Worktop cutouts can be made with elevated marine edge (see Figure 7).

If so required, cup sinks can be integrated in the fume-cupboard plate. Accidental release of liquids into the wastewater system can be prevented in various ways:

- by means of a broad raised edge, placed either laterally or at the back (see Figures 8 and 9). This raised edge can at the same time be used as a place for utensils or as a tap landing. In such case, the cup sink is mounted onto the fume-cupboard plate from below.
- by means of a spillover weir (see Figure 9). Here, the cup sink is also mounted onto the fume-cupboard plate from below.
- by means of a cup sink mounted into the fume-cupboard plate from above.

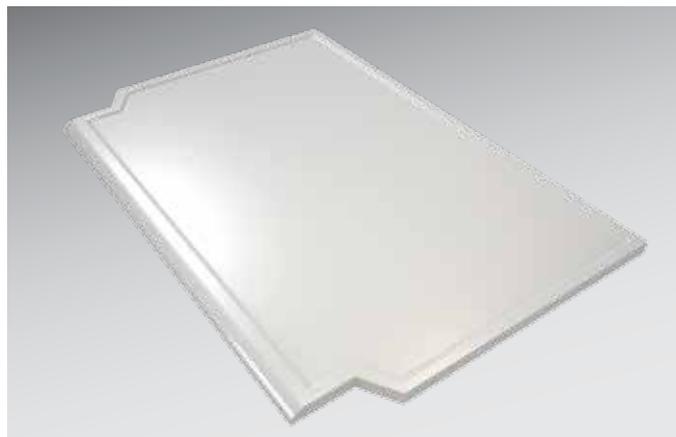


Figure 7
Example of edge cutouts for fume-cupboard side posts

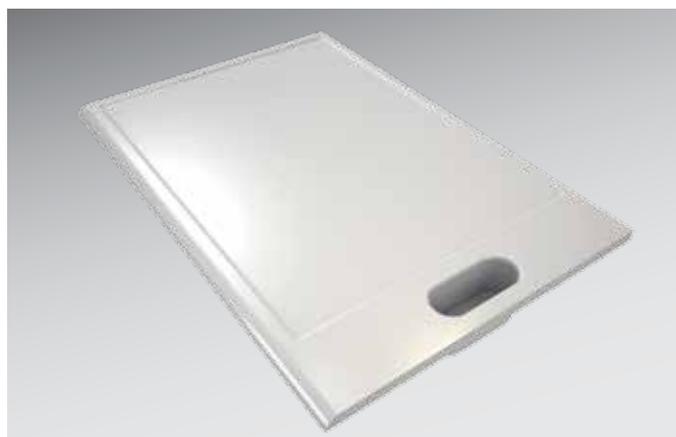


Figure 8
Example of a lateral raised edge with cup sink



Figure 9
Example of a spillover weir

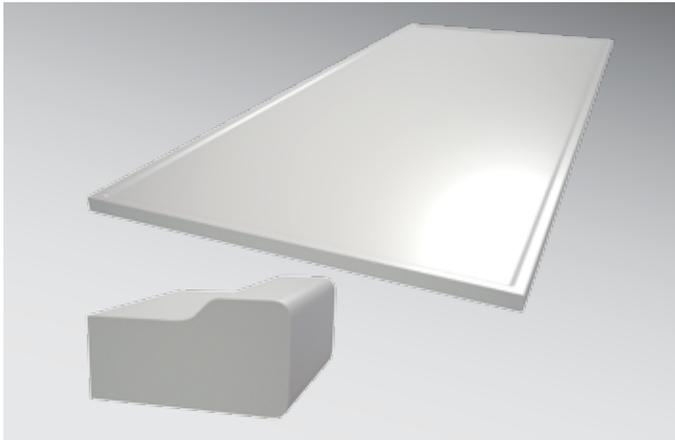


Figure 10
Front marine edge Type „C“

Marine Edge

In numerous laboratory workplaces it is appropriate or in many cases even mandatory to ensure protection from liquid overspill.

FRIDURIT premium laboratory benchtops are manufactured with integrated marine edge. The marine edge and work surface thus form a joint-free unit. Optimum cleaning without any risk of damaging the work surface is thus possible at all times.

Particularly in the fume-cupboard area the shape of the benchtop front edge can positively influence air conduction. Here, an elongated, rounded profile (edge type “Q”, see Figure 12) is often used.

Please see Page 17 for an overview of edge profiles.

We can of course also manufacture FRIDURIT laboratory benchtops as benchtops with just one marine edge at the front or without marine edge.

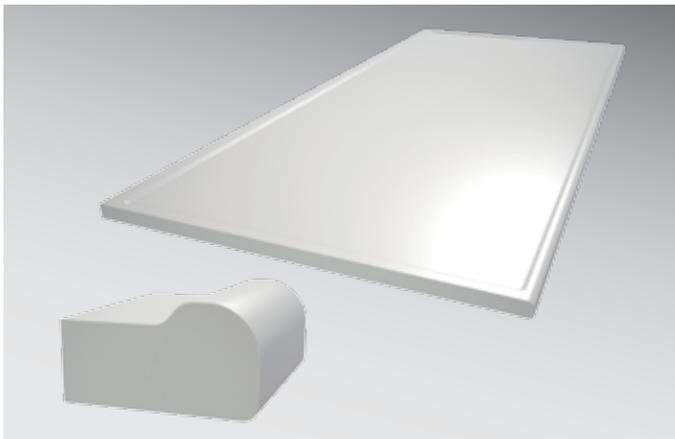


Figure 11
Front marine edge Type „P“

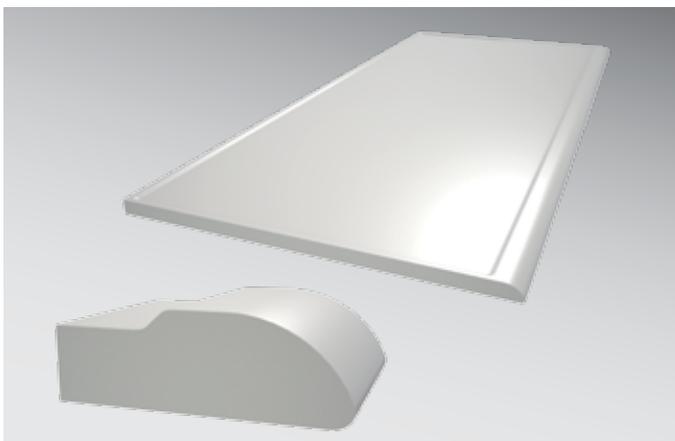


Figure 12
Front marine edge Type „Q“

Design Examples

Each FRIDURIT premium laboratory benchtop made of Technical Ceramics is manufactured individually. This enables you to arrange your work surface exactly according to your requirements, taking into account the material properties of Technical Ceramics. Some examples can be seen on the right.

Our Technical Service Team will be pleased to answer any questions you may have.

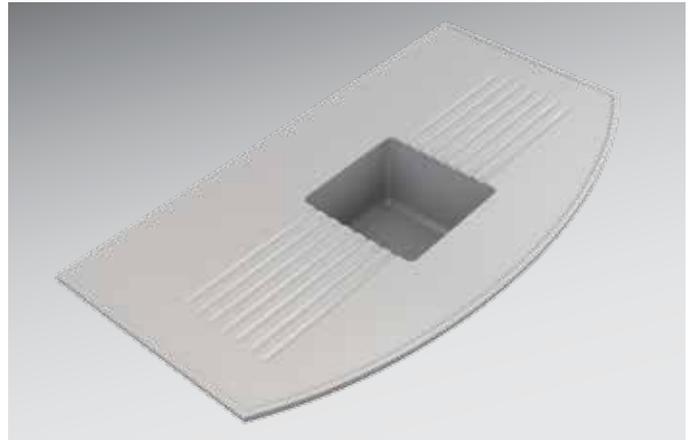


Figure 13

Sink unit with circumferential marine edge and drainage grooves



Figure 14

Sink unit with circumferential marine edge

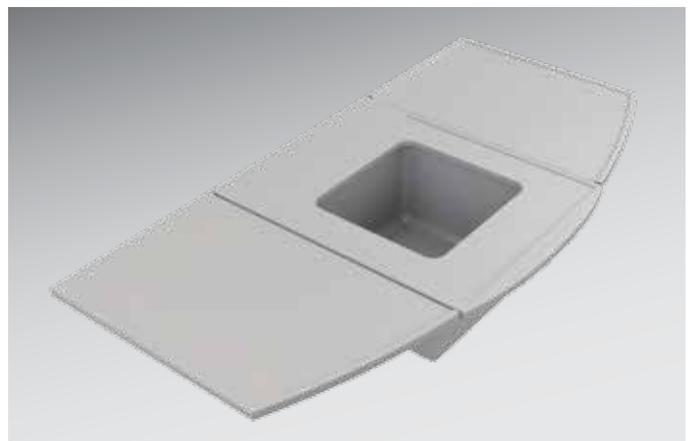


Figure 15

Split sink unit with tap landing

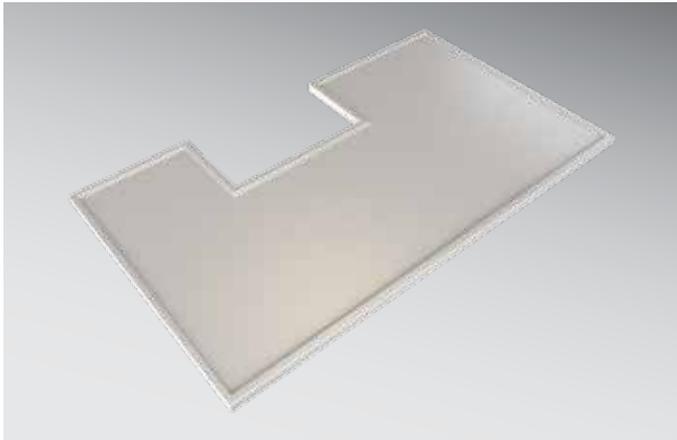


Figure 16
Worktop with circumferential marine edge and edge cutout

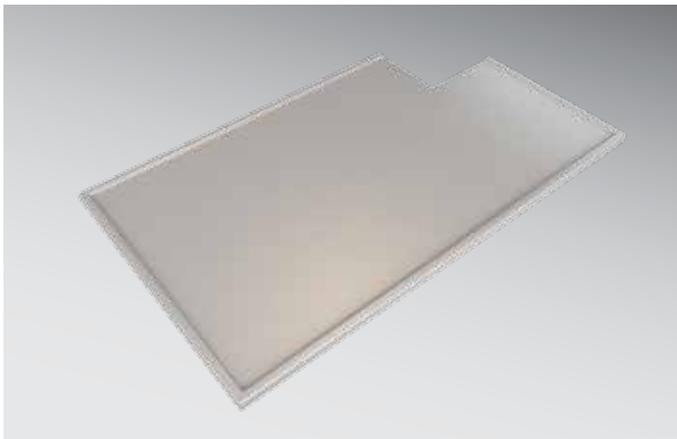


Figure 17
Worktop with edge cutout

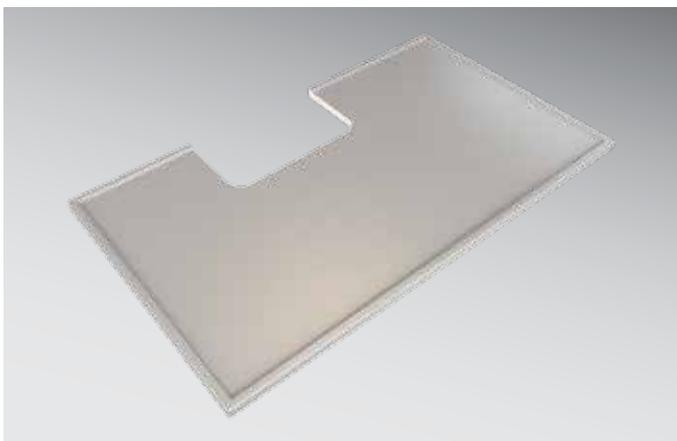


Figure 18
Worktop with round edge cutout

Adjustment to Structural Conditions

We will adjust your worktops to the existing structural conditions. Edge cutouts for pipes, struts and supports can be planned in. Here you can also choose between open worktops and closed worktops with circumferential marine edge.

Glaze Colours

A wide range of glaze colours as well as the option of selecting special colours make FRIDURIT laboratory benchtops and sinks made of Technical Ceramics products that satisfy the very highest aesthetically demands. Figure 19 shows a selection of glaze colours available. Laboratory benchtops and sinks are available in plain colour glazing. The benchtops also come in blackspeckled glazing.

We will be pleased to send you ceramic colour samples upon request.

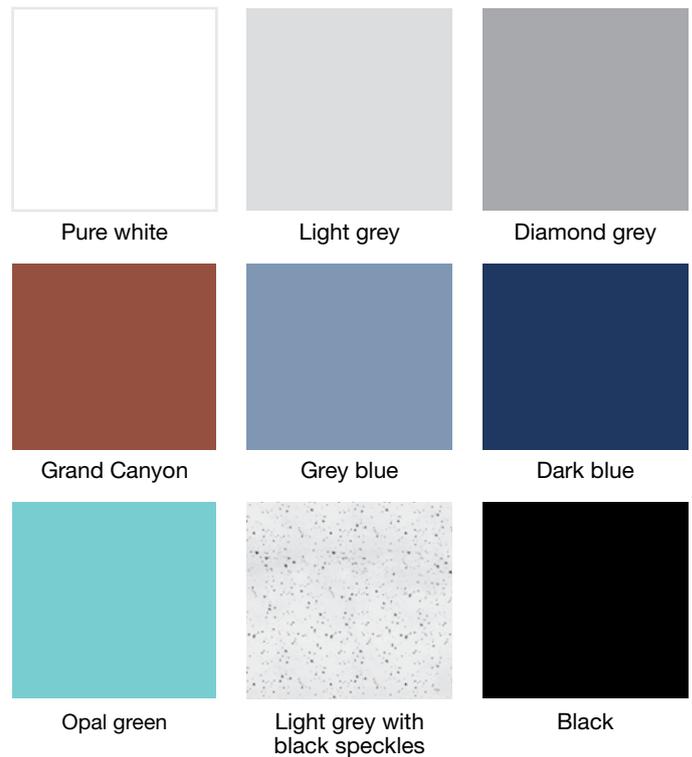


Figure 19

A Selection of glaze colours (Colours may vary from those illustrated)

Laboratory Sinks



Sinks

FRIDURIT sinks made of Technical Ceramics are the ideal match for FRIDURIT benchtops. They are glazed on the inside and around the edges and are supplied with a 1½" male screw PP outlet and standpipe.

Options for installation:

- top-mounted
- flush-mounted
- under-fixed

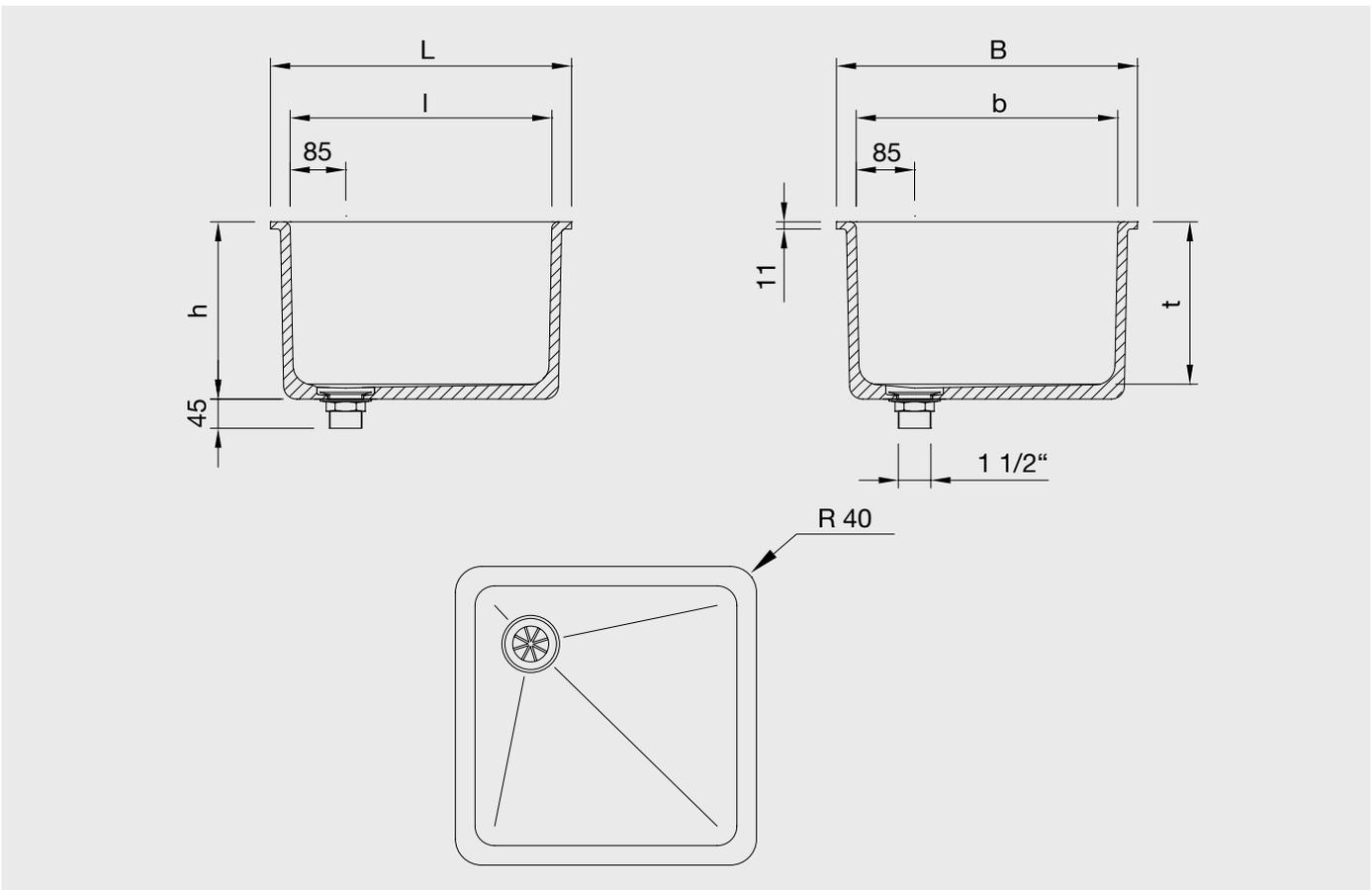
Figure 20

Internal Dimensions (in mm)			External Dimensions (in mm)			Weight (in kg)	Order Code
l	b	t	L	B	h		
400	400	250	460 ^{±3}	460 ^{±3}	273	25	VBES442
500	400	250	560 ^{±3}	460 ^{±3}	273	26	VBES542
600	400	250	660 ^{±3}	460 ^{±3}	273	32	VBES642

Further sink models are available.

Please note that FRIDURIT laboratory sinks are only available in plain glaze colours.

Figure 21



Cup Sinks - Oval

FRIDURIT cup sinks made of Technical Ceramics are the ideal match for FRIDURIT benchtops. They are glazed on the inside and around the edges and are supplied with a 1½" male screw PP outlet.

Options for installation:

- top-mounted
- flush-mounted
- under-fixed

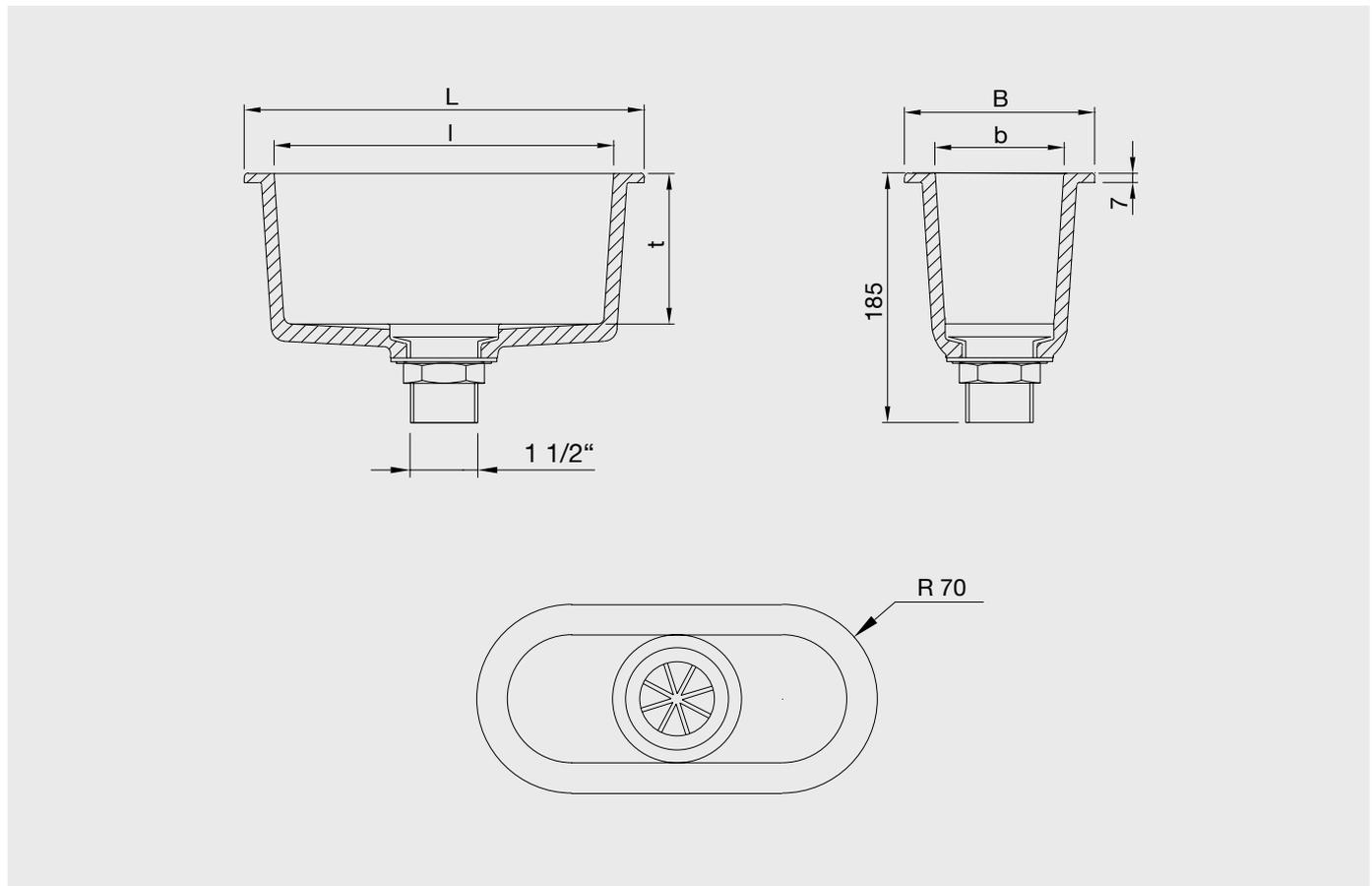


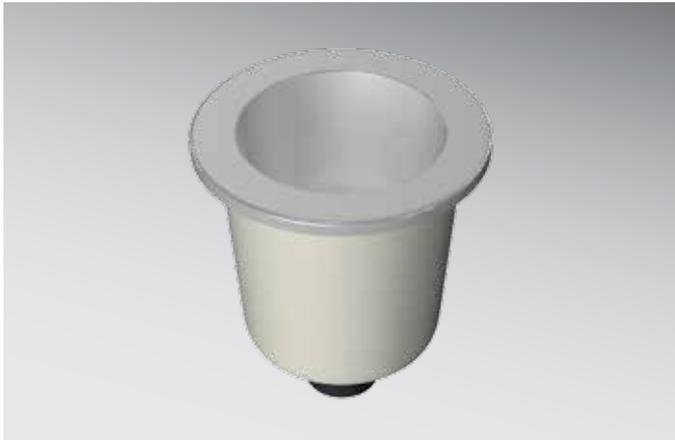
Figure 22

Internal Dimensions (in mm)			External Dimensions (in mm)			Weight (in kg)	Order Code
l	b	t	L	B	h		
250	95	112	294 ⁺³	140 ⁺³	125	3	VBPE291

Please note that FRIDURIT laboratory sinks are only available in plain glaze colours.

Figure 23





Cup Sinks - Round

FRIDURIT cup sinks made of Technical Ceramics are the ideal match for FRIDURIT benchtops. They are glazed on the inside and around the edges and are supplied with a 1½" male screw PP outlet.

Options for installation:

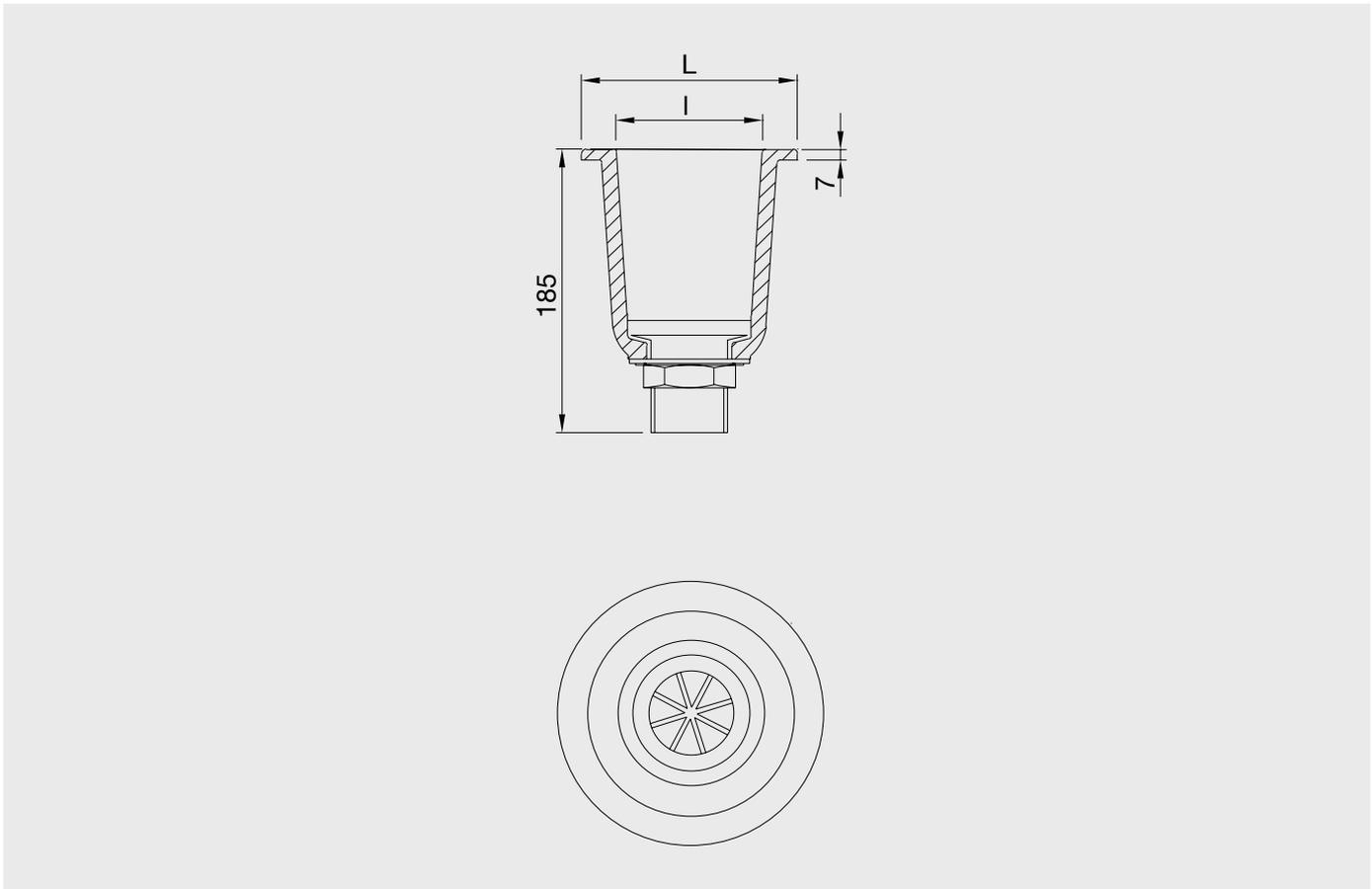
- top-mounted
- flush-mounted
- under-fixed

Figure 24

Internal Dimensions (in mm)		External Dimensions (in mm)		Weight (in kg)	Order Code
øI	t	øL	h		
105	112	145 ⁺³	125	1,5	VBPE111

Please note that FRIDURIT laboratory sinks are only available in plain glaze colours.

Figure 25



P-Trap

A polypropylene P-trap (stench trap) is available for connection to the waste-water pipe, whether horizontal or vertical.

Technical data:

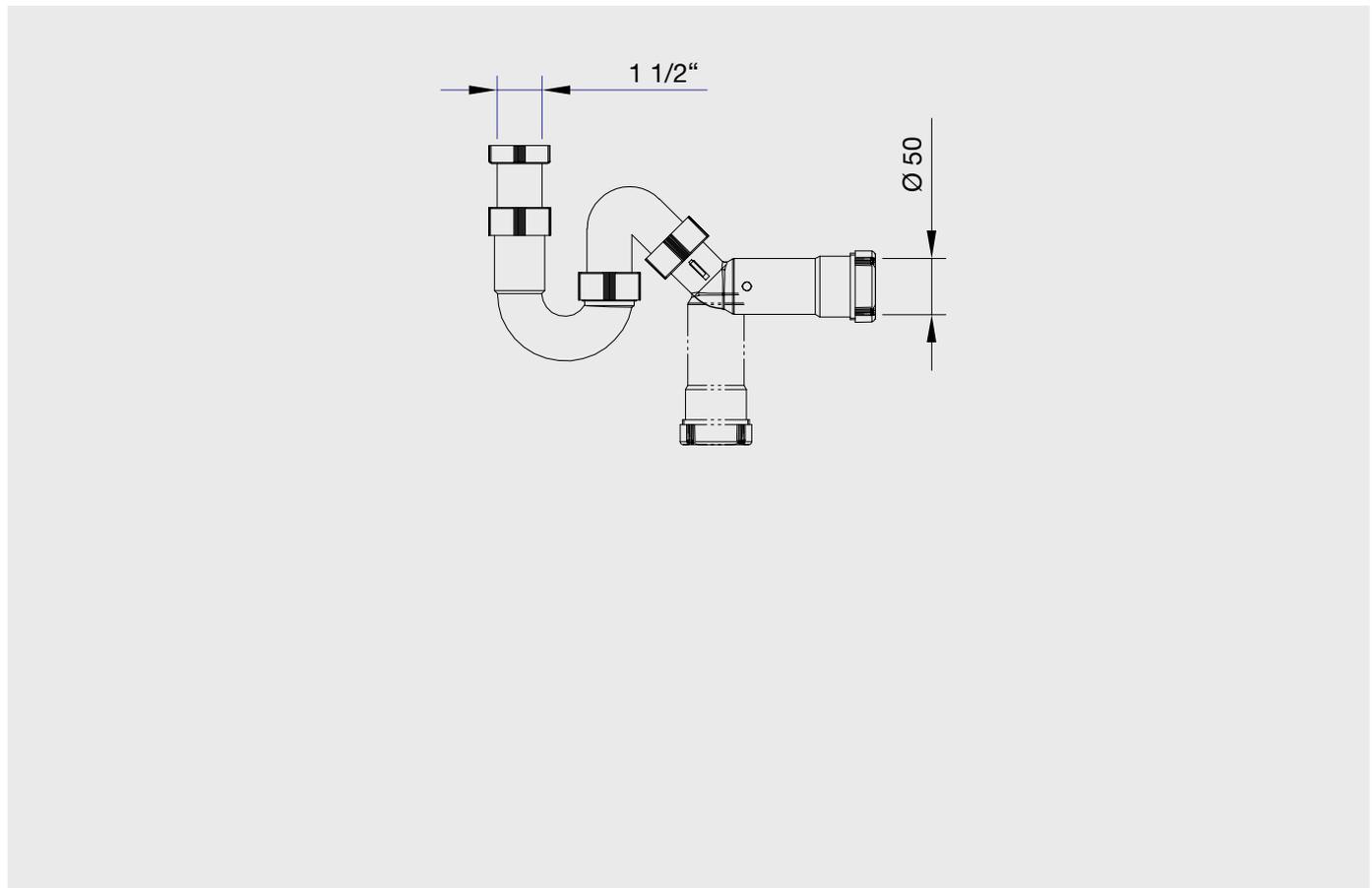
- Outlet: Compression fitting DN50
- Connection: 1½" female screw x 100 mm
- Order Code: BZS001



Figure 26

Description	Order Code
P-trap, horizontal/vertical Outlet: Compression fitting DN50 Connection: 1½" female screw x 100 mm	BZS001

Figure 27



Technology

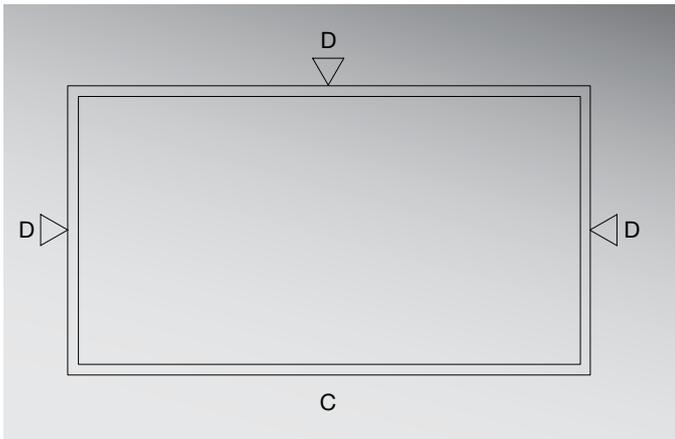


Figure 28
Benchtop with circumferential marine edge with 3 cut/unglazed edges, front edge glazed

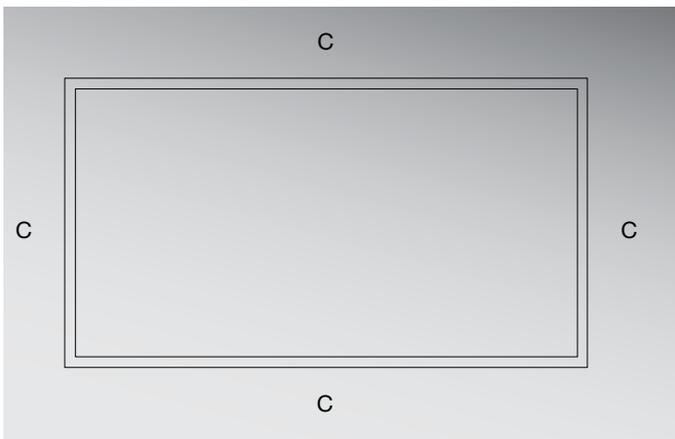


Figure 29
Fully glazed benchtop with circumferential marine edge

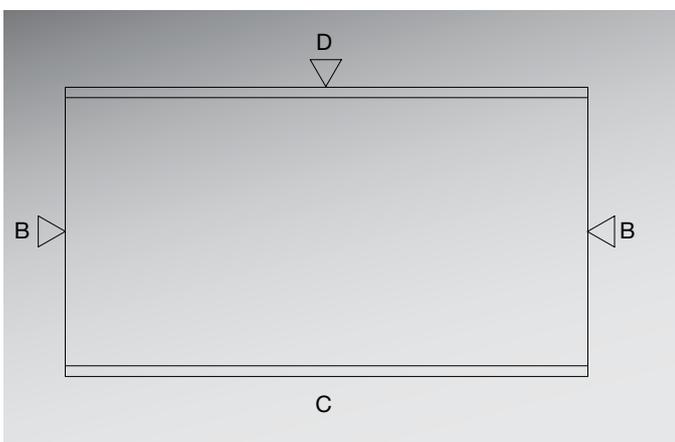


Figure 30
Benchtop with front and back marine edge with 3 cut and 1 glazed edge

Cutting Signs

Depending on the mounting environment FRIDURIT premium benchtops are manufactured with cut (i.e. unglazed) or glazed edges. We recommend a cut edge if it is “hidden”, e.g. when wall-fitted or service spine fitted. Joint edges are always cut. This leads to lower tolerances and ensures a smoother joint.

The edge finish is marked with the following symbols:

▽ = cut, unglazed edge
(mandatory information)

○ = glazed edge
(optional information)

During the manufacturing process ceramic benchtops are subject to material-specific shrinkage. Even when using the most advanced manufacturing technologies this cannot always be avoided. The shrinkage range varies from $\pm 1\text{mm}$ to $\pm 1\%$, depending on edge finishing.

The figures on the left show examples of benchtops with glazed and/or cut edges. For better understanding, the edge profiles have been marked with the respective letters (see Chapter on “Edge Profiles”). Indicating the edge profile by means of the symbols for the edge finish is sufficient when ordering.

Edge Profiles

FRIDURIT premium laboratory benchtops made of Technical Ceramics can be manufactured with a wide variety of edge profiles.

Standard edge profiles

Edge profiles „A“ and „B“ (without marine edge) as well as „C“ and „D“ (with marine edge) are the standard edge profiles for premium laboratory benchtops.

The following applies to the technical illustrations:

- A double line symbolises a marine edge manufactured as standard in profile „C“ (glazed) or „D“ (cut/unglazed).
- A single line depicts edge profile „A“ or „B“.

Other edge profiles

Apart from the standard profiles „C“ and „D“ the marine edge can be manufactured in further geometric shapes (see Figures 33-36). Edge profiles „N“, „O“ and „Q“ are the preferred profiles for the front edges of the fume cupboard plate in order to positively influence air conduction.

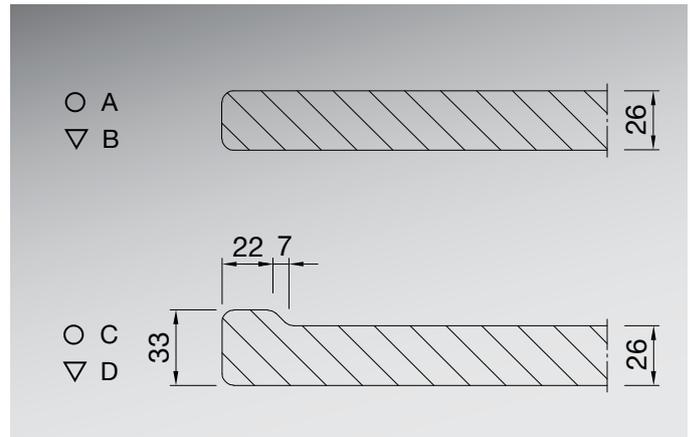


Figure 31
A, B

Figure 32
C, D

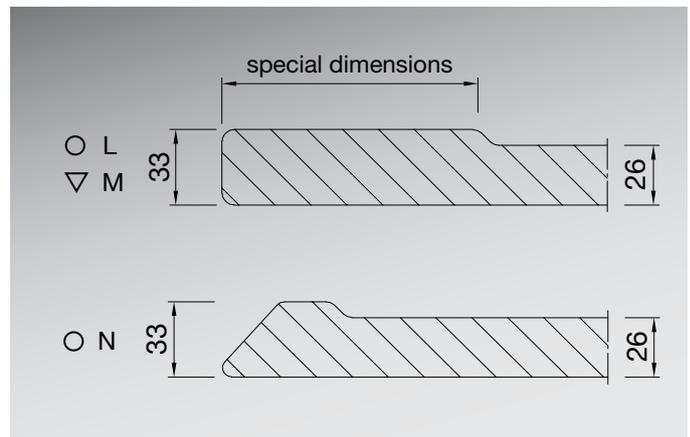


Figure 33
L, M

Figure 34
N

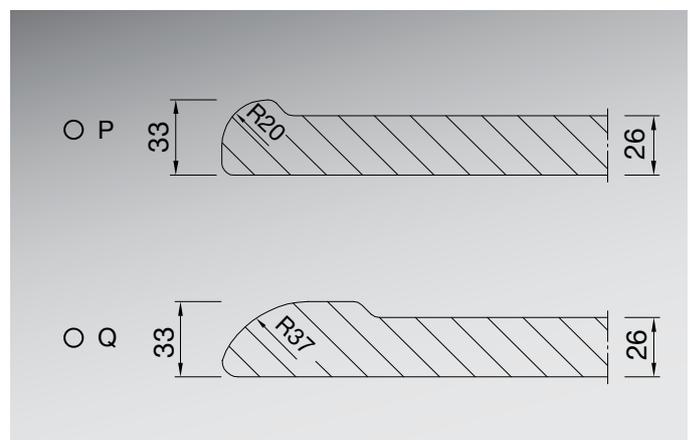


Figure 35
P

Figure 36
Q

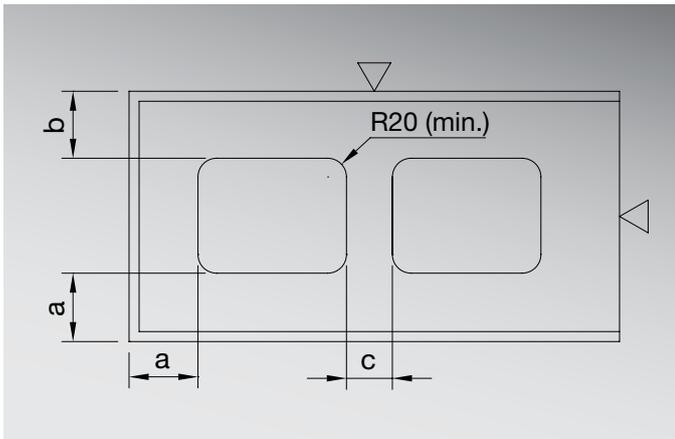


Figure 37
Minimum distances for glazed apertures

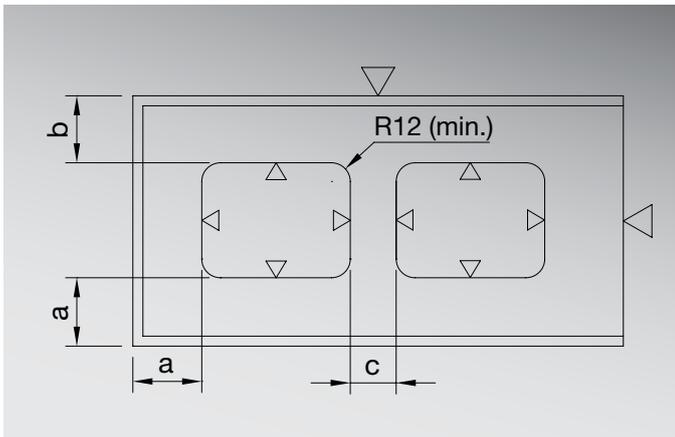


Figure 38
Minimum distances for unglazed apertures

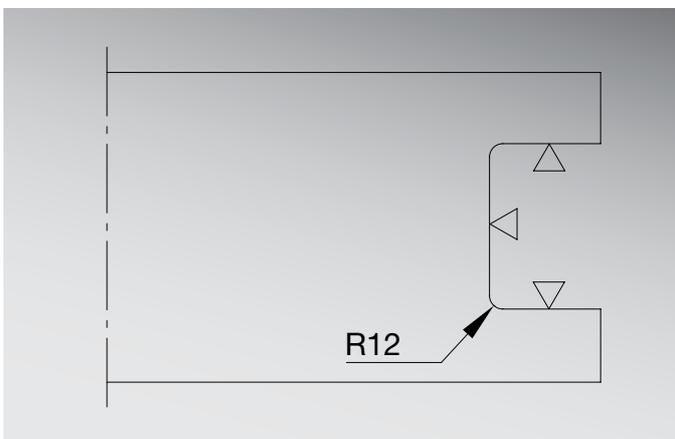


Figure 39
Example of a cut edge cutout

Apertures and Bores

The location of apertures and bores on the worktop can be selected freely while taking account of the minimum distances required by the material. The following basic principles apply:

Minimum distances for glazed apertures:

- a: min. 150 mm
(glazed aperture – glazed edge)
- b: min. 70 mm
(glazed aperture – cut edge)
- c: min. 100 mm
(glazed aperture – glazed aperture)

Minimum distances for unglazed apertures:

- a: min. 50 mm
(cut aperture – glazed edge)
- b: min. 50 mm
(cut aperture – cut edge)
- c: min. 100 mm
(cut aperture – cut aperture)

Bores are always unglazed and are available in the following standard diameters:
 \varnothing 5 / 8 / 10 / 15 / 20 / 25 / 28 / 30 / 35 / 40 / 50 mm
 Other diameters available upon request.

Edge Cutouts

The following applies to edge cutouts:

- Minimum corner radius for glazed edge cutouts: 20 mm
- Minimum corner radius for unglazed edge cutouts: 12 mm

Drainage Grooves

Drainage grooves with a maximum length of 500 mm can be integrated in the sink unit. Drainage grooves can only be supplied in combination with a glazed aperture and under-fixed sink.

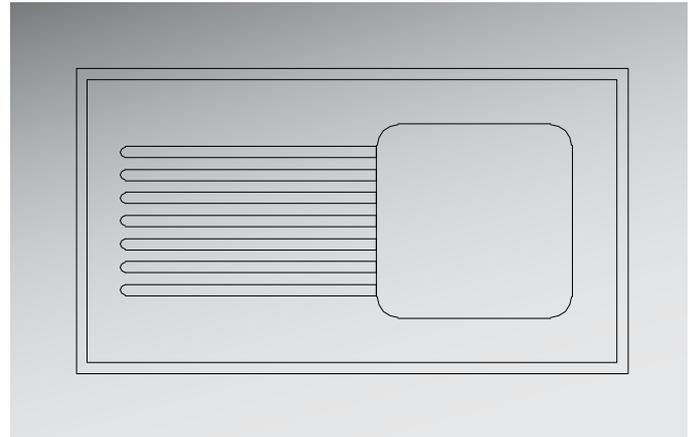


Figure 40
Drainage grooves for sink units

Corner Solutions

For corner solutions the mitre cuts illustrated here are provided upon request.

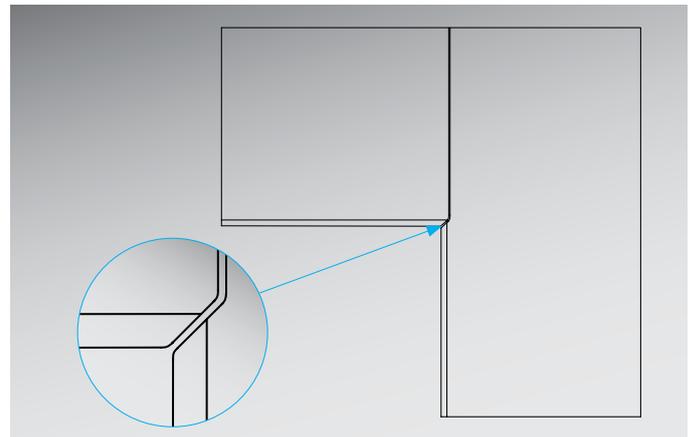


Figure 41
Corner solution with mitre cut

Mounting Instructions for Benchtops



Figure 42
Mounting benchtops with four-point support on levelling devices

Mounting

FRIDURIT laboratory benchtops are provided ready for mounting.

Due to their extreme stability, FRIDURIT laboratory benchtops are self-supporting. This means that four-point support is sufficient (see illustration).

The breaking load (P) of the benchtop without cutouts depends on the width (B) and length (L) of the worktop:
 $P \text{ (in kg)} = 1600 \times B/L \text{ (in mm)}$.

For swift and easy installation we recommend mounting benchtops on levelling devices (Order Code PZN001).

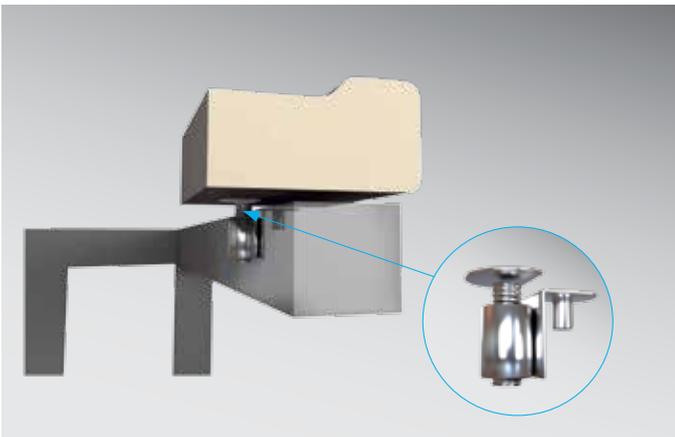


Figure 43
Levelling details

Joint Sealing

There are two ways of sealing full-size FRIDURIT laboratory benchtops:

- permanently elastic, using silicone
- hardening, for example using epoxy sealing material

We generally recommend the use of adhesive foam strip or similar materials as spacers in order to ensure an even joint. Joint width should already be taken into consideration when planning benchtop dimensions.

We will be pleased to send you further instructions containing further details.

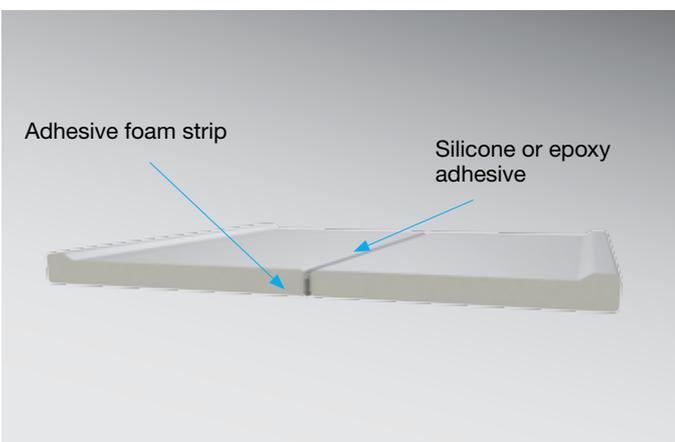


Figure 44
Joint details

Mounting Instructions for Laboratory Sinks

Installation Options

Top-mounted

Sinks are top-mounted in an aperture (unglazed) of the full-size FRIDURIT laboratory benchtop and then sealed with silicone (see Figure 45). Uncontrolled leakage of liquid into the waste-water system can thus be prevented.



Figure 45
Example of top-mounted sink

Flush-mounted

Sinks are flush-mounted in the stepped aperture (unglazed) of the full-size FRIDURIT laboratory benchtop and sealed with permanently elastic silicone or by means of hardening (see Figure 46). The top joint can very easily be cleaned.



Figure 46
Example of flush-mounted sink

Under-fixed

Sinks can be joined to the full-size FRIDURIT laboratory benchtops by means of hardening (see Figure 47), for example using epoxy adhesive. No additional sink-support structures are in this case needed.

Alternatively, the sinks can also be sealed using permanently elastic silicone. A support structure must here be provided by the customer. Permanently elastic sealing allows later dismantling of the sink.

We will be pleased to send you detailed mounting instructions for our laboratory sinks.



Figure 47
Example of under-fixed sink

General Product Information



FRIDURIT premium full-size laboratory benchtops and sinks are made of Technical Ceramics (chemical-technical stoneware in accordance with DIN EN 14879-6, Table 5). The superior-quality siliceous material is produced using natural raw materials such as clay, kaolin and feldspar in a special kilning process at temperatures exceeding 1200 °C. FRIDURIT premium laboratory benchtops are manufactured in accordance with DIN EN 12916.

They can be supplied with a joint-free circum-ferential marine edge that provides protection from liquid overspill.

Cleaning

The high density of the material results in easy-to-clean, permanently sealed surfaces that are also virtually joint-free due to the large size of the laboratory benchtops.

We recommend cleaning the FRIDURIT worktops with a sponge or cloth using traditional cleaning agents such as those used in bathrooms. Stubborn dirt on FRIDURIT laboratory benchtops can be removed using an abrasive sponge suitable for glass ceramics. This will not result in any surface scratching.

Quality Guidelines

Before leaving our factory all our products are subjected to stringent controls in order to ensure the same high standards of quality. Just like wood or leather products, which are much appreciated for their individual grain and texture, FRIDURIT laboratory benchtops made of Technical Ceramics may show optical irregularities. Natural variations in colour and appearance on the same benchtop and between the various work surfaces are typical of the material and are unavoidable due to the complex manufacturing process. In addition, variations in dimensions, evenness and angularity of the benchtops as a result of material properties may arise (see DIN EN 12916).

The features indicated do not affect quality and thus do not constitute any defects. Far more, they belong to the characteristic properties of the material.

We will be pleased to answer any questions you may have.

Material Properties

Physical properties

Property	Measured value	Norm	Result
Raw density	2,37 g/cm ³	DIN EN 993-1	
Weight	65 kg/m ²		
Thermal conductivity	1,57 W/mK	DIN EN 821-2	
Breaking load (P) benchtops in kg:	P = 1600 x B/L		
Behaviour in fire	Building material class A1	DIN EN 13501-1, DIN 4102	non-combustible, no thermal load

Mechanical properties

Property	Measured value	Norm	Result
Cold compression strength	159 MPa	DIN EN 993-5	
Bending strength	41,3 MPa	DIN EN 993-6	
Static modulus of elasticity	39,0 GPa	DIN EN 993-6	
Wear	8,5 cm ³ /50 cm ²	DIN 52108	
Scratch hardness	7 (Mohs scale)	DIN EN 101	
Crazing resistance		DIN EN ISO 10545-11	no crazing

Thermal properties

Property	Measured value	Norm	Result
Thermal expansion	(α_{25-400}) 5,6 10 ⁻⁶ K ⁻¹ (α_{25-800}) 5,9 10 ⁻⁶ K ⁻¹ $(\alpha_{25-1200})$ 6,3 10 ⁻⁶ K ⁻¹	DIN 51045-2	
Application temperature	up to 550 °C, temporary exposure up to 800 °C		

Chemical resistance

Property	Description	Norm	Result
Resistance to testing solutions (e.g. solution of hydrochloric acid and sodium hypochloride)	Test samples made of FRIDURIT Technical Ceramics are exposed to testing solutions. The samples are examined visually after a specific period of time.	DIN EN ISO 10545-13	None of the testing solutions affect the test samples.
Resistance to staining (e.g. iodine)		DIN EN ISO 10545-14	Solutions can be completely removed with water.

Optical properties

Silk finish surface in the current glaze colours. Other colours are available to special order. Colour samples are available on request.

Worldwide at your doorstep

FRIATEC Aktiengesellschaft
Ceramics Division
Steinzeugstraße 50
68229 Mannheim, Germany
Phone: +49 621 486 - 1879
Fax: +49 621 486 - 1605
info-fridurit@friatec.de
www.friatec.com

