



Aliaxis



FRIDURIT®
**TECHNICAL
CERAMICS**

Work surfaces meeting the highest
requirements for design and
functionality in the laboratory

www.friatec.com/ceramics





FRIDURIT® TECHNICAL CERAMICS **FOR LABORATORY PERFECTION**

The requirements for quality in modern laboratories increase in accordance with the demands and standards imposed on products and services. The same applies to the environment in which tests, analyses and experiments are carried out. When kept intact, clean and hygienic, laboratory work surfaces contribute significantly to meeting these requirements. Such work environments support high-quality work and allow the necessary conditions to accomplish it. The condition of laboratory work surfaces also contributes to the overall impression of a laboratory.

FRIDURIT full-size laboratory benchtops and sinks made of Technical Ceramics have been used for many years in different laboratory applications.

The FRIDURIT Technical Ceramics surface is non-porous, offering a unique combination of chemical resistance, scratch resistance and temperature resistance. This property profile allows the perfect work environment to be permanently maintained. The appearance of FRIDURIT laboratory worktops remains flawless - even after many years of intense use.

FRIDURIT® TECHNICAL CERAMICS **CUSTOMISED PERFECTION**

Over many years, FRIDURIT laboratory benchtops and sinks made of Technical Ceramics have shown excellent results in a wide range of different laboratory environments. They are characterised by the highest resistance and individual design; their appearance is always like new.



Every FRIDURIT laboratory benchtop made of Technical Ceramics is produced as an individual piece and dispatched ready for mounting. All benchtops are self-supporting, i.e. they do not require mounting on an additional base but can be placed directly on the cupboard. A four-point support is sufficient.

The FRIDURIT premium product line has an integrated ceramic marine edge which protects liquids from overflowing, offering maximum safety and the best possible hygiene in everyday laboratory work.

The 20 mm self-supporting FRIDURIT modular laboratory

benchtop is an attractive alternative without a raised ceramic edge. FRIDURIT laboratory sinks ideally complement laboratory applications when water and other liquids are used.

Whether your primary concern is a permanent, stable work surface or the environment, or special requirements with regard to size, shape and colour - we always guarantee the highest quality and unique design - that is customised perfection.

GLAZE COLOURS

A wide range of standard glazes and special colours is available enabling FRIDURIT laboratory benchtops and sinks made of Technical Ceramics to meet the highest aesthetic demands.

You can find a selection of available glaze colours here. Laboratory benchtops and sinks are available in plain colours.

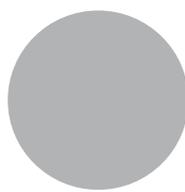
The benchtops are also available with black-speckled glazing. Printed patterns are non-binding and a sample of the colour of the material is shown. Ceramic colour samples are available on request.



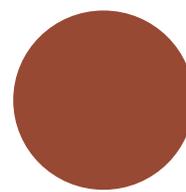
PURE WHITE



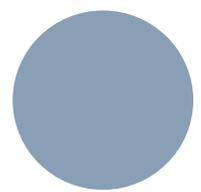
LIGHT GREY



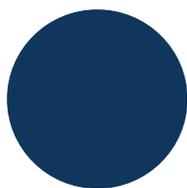
DIAMOND GREY



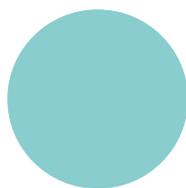
GRAND CANYON



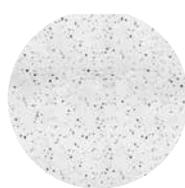
GREY BLUE



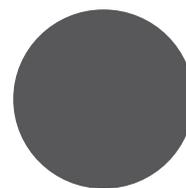
DARK BLUE



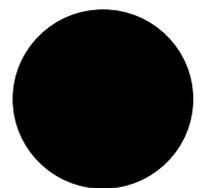
OPAL GREEN



**LIGHT GREY WITH
BLACK SPECKLES**



LAVA GREY



BLACK

FRIDURIT[®] TECHNICAL CERAMICS **ALWAYS LIKE NEW**

FRIDURIT Technical Ceramics show permanent resistance to exceptionally high requirements in the laboratory. The superior material density is more scratch-resistant when compared to other benchtop materials and has a non-porous surface.



EASY TO CLEAN



SCRATCH-PROOF



**CHEMICALLY
RESISTANT**



**THERMALLY
RESISTANT**



**MICROBIOLOGICALLY
PURE**



ECO-FRIENDLY



The wide spectrum of ceramic materials ranges from porcelain tableware and floor tiles to high-temperature technology used in the aerospace industry. FRIDURIT Technical Ceramics belongs to the group of technical stoneware and is used primarily in chemical and technical applications. The ceramic formulation has been optimised over many years resulting in resistant and durable material properties that meet any everyday laboratory requirements.

FRIDURIT[®] TECHNICAL CERAMICS

EASY TO CLEAN

When compared to other materials, FRIDURIT laboratory benchtops made of Technical Ceramics are exceptional when it comes to hygiene and care. Superior cleanability and robust beauty are outstanding product advantages.

Cleaning laboratory work surfaces can put extreme stress on the surface, particularly when dirt is very hard to remove. Very few materials can withstand these cleaning procedures without being damaged. FRIDURIT laboratory benchtops made of Technical Ceramics are easy to clean: colours, coatings, dirt or grease - everything can be removed without leaving any residue.

Extreme hardness and wear resistance mean that our Technical Ceramics can withstand repeated cleaning procedures using aggressive detergents and tools.

We recommend cleaning the FRIDURIT laboratory benchtops with a sponge or cloth and conventional detergents suitable for cleaning of bathrooms.

Persistent dirt can be removed using a sponge for scrubbing glass ceramic surfaces.

Do not use detergents containing hydrofluoric acid or its compounds, as these will damage the surface.

We are at your disposal for further questions.



FRIDURIT® TECHNICAL CERAMICS **SCRATCH-PROOF**

FRIDURIT laboratory benchtops always look like new. Their extraordinarily high scratch resistance prevents any sign of wear.

Hardness is an outstanding property of ceramic materials. Different methods such as Rockwell, Brinell, Vickers or Knoop are used to determine the hardness of a material.

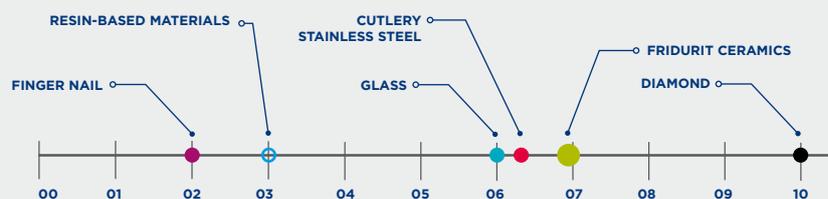
Mohs Hardness is a procedure that provides a clear classification of scratch-resistance of different materials. The test is carried out by dragging the point of a material of known hardness across the surface being evaluated and trying to scratch the surface of the material.

Diamond is the hardest material with a hardness rating of 10. It can

scratch any material with a smaller hardness value. A standard cutlery steel cannot damage FRIDURIT Technical Ceramics.

FRIDURIT Technical Ceramics has a hardness rating of 7.

MOHS SCALE OF HARDNESS





FRIDURIT[®] TECHNICAL CERAMICS **CHEMICALLY RESISTANT**

FRIDURIT Technical Ceramics can withstand common laboratory solvents and chemicals - even at high concentrations, extreme temperatures and long exposure times.

Years of experience with technical requirements in chemical apparatus engineering allowed FRIATEC AG to enhance its expertise in providing material solutions for the most demanding conditions. FRIDURIT laboratory benchtops have been subjected to practical tests for more than 50 years and have proven their resistance in laboratories all over the world.

Chemical resistance testing of laboratory benchtop materials

is proposed by SEFA (Scientific Equipment and Furniture Association). These tests expose laboratory work surfaces to a reagent for a period of 24 hours. Results are rated as “No Effect - Slight change in colour or gloss - Slight surface etching or severe staining - Corrosion, pitting or surface etching”.

Many benchtop materials show significant changes when exposed to common laboratory chemicals, giving an unclean and unsightly

impression. With the exception of hydrofluoric acid, FRIDURIT Technical Ceramics does not stain or lose its gloss, ensuring that surfaces are preserved in perfect condition.

The table on page 21 provides some examples showing the performance of the material.



FRIDURIT® TECHNICAL CERAMICS

THERMALLY RESISTANT

An outstanding feature of ceramic materials is their temperature resistance. FRIDURIT Technical Ceramics is manufactured in a sintering process at temperatures in excess of 1200°C; it can withstand continual thermal stress without damage.

Regular laboratory activities typically require extremely high or low temperatures.

When working with Bunsen burners, hotplates or samples from furnaces and dryers, work surfaces are exposed to high temperatures. On the other hand, laboratory work surfaces must be able to withstand

nitrogen-cooled objects with temperatures below -196°C.

FRIDURIT Technical Ceramics exhibits permanent resistance to thermal influences. Its surface remains free of damage when in contact with hot crucibles or chemicals. Technical Ceramics is non-flammable and 100% fireproof.

The material is rated building material class A1 and therefore shows no risk of fire.



FRIDURIT[®] TECHNICAL CERAMICS **MICROBIOLOGICALLY CLEAN**

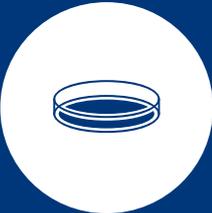
Cleaning is crucial in laboratory applications. Laboratory benchtops made of FRIDURIT Technical Ceramics have a permanent solid surface providing the perfect working environment.

FRIDURIT work surfaces allow easy decontamination and disinfection. Their durable, scratch-resistant and non-porous surfaces do not provide a breeding ground for germs such as viruses and bacteria.

The durable soundness of work surfaces is decisive for laboratory users working with radioactive substances; it is extremely important

to create conditions that guarantee reliable and safe decontamination. FRIDURIT Technical Ceramics is used in institutions where radioactivity is measured, such as the Regional Office for Environment and Radiation Protection. Such measurements may not be affected by changing radiation conditions in the working environment.

A smooth, sealed surface without damage guarantees hygienic conditions and prevents bacteria and other micro-organisms from getting into or growing on the surface. The ideal cleanability prevents the formation of nutrients on the surface.



FRIDURIT[®] TECHNICAL CERAMICS **ENVIROMENTALLY FRIENDLY**

FRIDURIT Technical Ceramics is durable, fully recyclable and therefore particularly environmentally friendly and sustainable.

A decision for FRIDURIT Laboratory Technology is a decision for environmental responsiveness. Our products meet the highest national and international standards for safety, environmental protection and sustainability in laboratory construction projects.

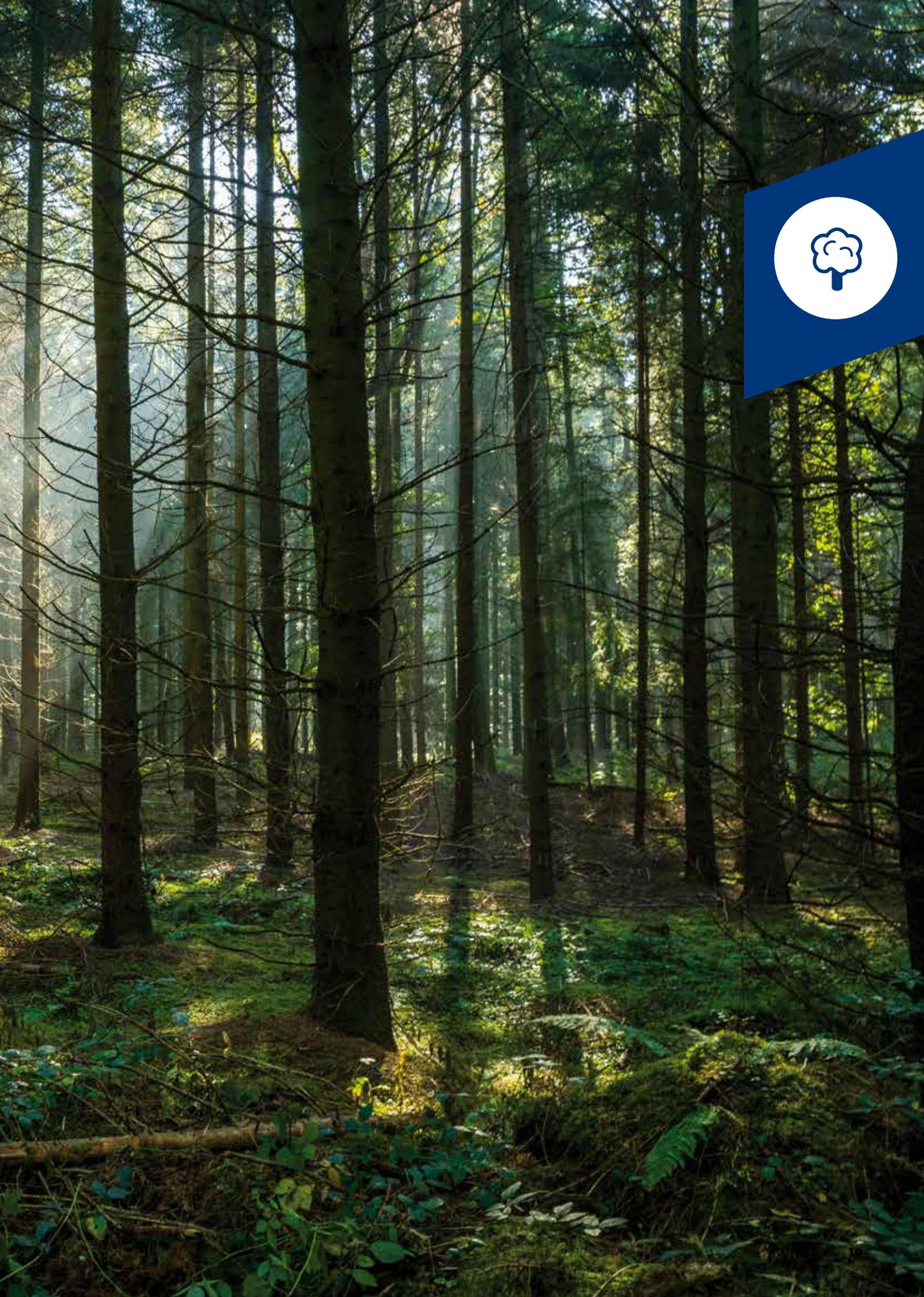
Our products are manufactured solely from natural and recycled raw materials from the earth such as clay, kaolin and feldspar. As such materials contain no chemical components, they can be easily recycled at any time during the

production process or disposed of after many years of use in laboratories.

FRIDURIT Technical Ceramics is a classic example of green building materials and is of great importance when implementing green building concepts. Concepts such as LEED or BREEAM increase the resource efficiency of buildings, at the same time reducing adverse effects on health and the environment. Laboratory users work on surfaces that are completely free of emissions and safe in every respect.

FRIDURIT Technical Ceramics is non-flammable, reducing the risk of fire (building material class A1).

FRDURIT Technical Ceramics is produced in accordance with ISO standards for general process control (ISO 9001:2008), application of an energy management system (ISO 50001:2011) and compliance with environmentally relevant aspects (ISO 14001:2004).



FRIDURIT® TECHNICAL CERAMICS

MATERIAL PROPERTIES

PHYSICAL PROPERTIES

Property	Result	Unit	Standard applied
Raw density	2,24	g/cm ³	DIN EN ISO 10545-3
Weight	65	kg/m ²	
Scratch hardness	7	Mohs-Härte	DIN EN 15771
Crazing resistance	no crazing		DIN EN ISO 10545-11
Wear	Class 4		DIN EN ISO 10545-7

MECHANICAL PROPERTIES

Property	Result	Unit	Standard applied
Cold compression strength	159	MPa	DIN EN 993-5
Breaking strength	11788	N	DIN EN ISO 10545-4
Modulus of rupture	42,1	N/mm ²	DIN EN ISO 10545-4
Static modulus of elasticity	39	GPa	EN 993-6

THERMAL PROPERTIES

Property	Result	Unit	Standard applied
Fire load	non-flammable, Euroclass A1		DIN EN 13501-1
Thermal conductivity	1,57	W/mK	DIN EN 821-2
Thermal expansion	(α_{25-400}) 5,6 10 ⁻⁶ K ⁻¹ (α_{25-800}) 5,9 10 ⁻⁶ K ⁻¹	K ⁻¹	DIN 51045-2
Thermal expansion	up to 550°C, temporary exposure up to 800°C		

CHEMICAL RESISTANCE

Property	Result	Description	Standard applied
Resistance to testing solutions (e.g. solution of hydrochloric acid and sodium hypochloride)	No visible effect on the test specimens.	Test samples made of FRIDURIT Technical Ceramics are exposed to testing solutions.	DIN EN ISO 10545-13
Resistance to staining (e.g. chrome green)	Stains can be completely removed with hot water (Class 5).	The samples are examined visually after a specific period of time.	DIN EN ISO 10545-14

NOTE

Details of our products are based on the results of extensive development and the associated test findings in-house and at accredited testing laboratories. Many years of experience in the most varied fields of application provide an additional guarantee for the durability of products made 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. The statutory warranty provisions apply. We also refer to our General Terms and Conditions of Supply and Payment.

We reserve the right to make technical changes.

FRIDURIT® TECHNICAL CERAMICS

CHEMICAL RESISTANCE

	Reagent	Evaluation
01	Acetic acid (99%)	0
02	Acetic anhydride	0
03	Acetone	0
04	Acetonitrile	0
05	Acidrine orange	0
06	Alizarin complexone dihydrate	0
07	Ammonium hydroxide (28%)	0
08	Amylacetat	0
09	Aniline blue, water soluble	0
10	Benzene	0
11	Butyl alcohol	0
12	Carbol fuchsin	0
13	Carbon tetrachloride	0
14	Carmine	0
15	Chloroform	0
16	Chromium(VI)oxide (60%)	0
17	Congo red	0
18	Copper sulphate (10%)	0
19	Cresol	0
20	Crystal violet (gentian)	0
21	Dichlor acetic acid	0
22	Dichlormethane	0
23	Dioxane	0
24	Eosin B	0
25	Ethyl acetate	0
26	Ethylalcohol	0
27	Ethylene glycol	0
28	Ethyl ether	0
29	Ferric(III)chloride (10%)	0
30	Formaldehyde (37%)	0
31	Formic acid (99%)	0
32	Fuchsin (basic)	0
33	Furfural	0
34	Gasoline	0
35	Giemsa stain	0
36	Hydrochloric acid (10%)	0
37	Hydrochloric acid (37%)	0
38	Hydrofluoric acid	3.0
39	Hydrogen peroxide	0
40	Iodine solution (0.1 N)	0
41	Iodine (crystals)	0
42	Iodine (tincture)	0
43	Malachite green oxalate	0

	Reagent	Evaluation
44	Methylalcohol	0
45	Methylene blue	0
46	Methylethylketone	0
47	Methylisobutylketone	0
48	Methyl violet 2B	0
49	Mono Chlorbenzene	0
50	Naphtaline	0
51	n-Butyl acetate	0
52	Nitric acid (10%)	0
53	Nitric acid (20%)	0
54	Nitric acid (30%)	0
55	Nitric acid (65%)	0
56	Nitric acid (70%)	0
57	Nitric acid (65%) : hydrochloric acid (37%)	0
58	n-Hexane	0
59	Perchloric acid (60%)	0
60	Phenol	0
61	Phosphoric acid (85%)	0
62	Potassium iodite (10%)	0
63	Potassium permanganate (10%)	0
64	Safranin O	0
65	Silver nitrate (1%)	0
66	Sodium chloride (10%)	0
67	Sodium hydroxide (10%)	0
68	Sodium hydroxide (20%)	0
69	Sodium hydroxide (40%)	0
70	Sodium hydroxide (flakes)	0
71	Sodium hypochlorite (13%)	0
72	Sudan III	0
73	Sulphuric acid (10%)	0
74	Sulphuric acid (25%)	0
75	Sulphuric acid (33%)	0
76	Sulphuric acid (77%)	0
77	Sulphuric acid (85%)	0
78	Sulphuric acid (96-98%)	0
79	50% Sulphuric acid (77%): 50% Nitric acid (70%)	0
80	50% Sulphuric acid (85%): 50% Nitric acid (70%)	0
81	Tetrahydrofurane	0
82	Toluene	0
83	Trichlorethylene	0
84	Xylene	0
85	Zinc chloride (saturated)	0

TEST PROCEDURE

The chemical spot test was made by applying 5 drops of each reagent to the surface of each panel. The acids, bases, salts, specific chemicals and biological stains were covered with a watch glass concave side down to confine the reagent. The spot test of the solvents was tested as follows: A cotton wool ball was saturated with the solvent and placed on the surface. The cotton wool ball was covered by an inverted wide mouth bottle to retard evaporation. At the end of the 24-hour test period the chemicals have been removed by water and customary detergents, dried and valuated.

EVALUATION

- 0 No change in colour and/or gloss
- 3,0 Clear change in colour and/or gloss and etching and/or corrosion of the surface

FRIDURIT® LABORATORY TECHNOLOGY FOR LABORATORY PERFECTION

FRIDURIT Laboratory Technology is a business section of FRIATEC AG. Laboratory benchtops and sinks made of Technical Ceramics, as well as fume scrubbers and neutralisation units are designed, manufactured and sold under the brand name FRIDURIT.

FRIDURIT laboratory benchtops and sinks made of Technical Ceramics have been tried and tested for a great many years and in a wide variety of laboratory environments. They are hallmarked by their extreme resilience, individual design and lasting good looks.

Due to its exceptional material density FRIDURIT Technical Ceramics is more scratch-resistant than all other materials used in benchtops and has a pore-free surface.

FRIDURIT has years of experience in decentralized waste-air treatment at the laboratory fume cupboard itself as well as neutralisation of acid and alkaline waste-water directly at the source of emission. Treatment of harmful substances from water and air at source ensures efficient work processes, preservation of the building substance and protection of the environment.

FRIDURIT stands for leading know-how in materials and innovative environmental technologies. Due to their extreme durability and suitability for recycling FRIDURIT products make a major contribution to sustainable manufacturing.



FRIATEC

INNOVATIVE SOLUTIONS FOR THE GLOBAL MARKET

INNOVATIONS FOR MORE THAN 150 YEARS

The company was founded in 1863 in Mannheim, Germany, as a brickyard and succeeded in developing its first pathbreaking innovation, chemical stoneware, in 1888. Numerous new developments followed. Among other things, the company started in the mid of the past century processing plastics and combined modern and traditional materials when producing chemical devices and facilities. The following years were characterised by the expansion in the core business and the opening up of more and more new business segments. As Deutsche Steinzeug and later as Friedrichsfeld GmbH, the company, which has been operating under the name FRIATEC AG since 1993, continuously developed to become an internationally active, diversified company.

SPECTRUM OF INNOVATIVE SOLUTIONS

As such, FRIATEC AG today offers a spectrum of innovative solutions for many industries, e.g. jointing technology for pipe systems, but also ceramic components which are used in laboratory and electrical engineering but also in medical engineering. With its sophisticated solutions, FRIATEC AG is not only among the most well-known and well-established companies in the metropolitan region Rhine-Neckar but is also one of the global market leaders of its industry.

PARTNER OF A POWERFUL COMMUNITY

Since 2003, FRIATEC AG has been a member of the ALIAXIS group of companies with headquarters in Brussels. ALIAXIS is the worldwide largest producer of plastic pipe systems for the construction industry, the industry and utilities.

**FRIATEC AG specialises in
products made of corrosion
and wear-resistant materials.**

Aliaxis

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