

Kerform Kerasetter Kerheat



Edition - 1999



Kerform CVS

Alkaline-Earth Silica Fibre Vacuum-formed Products

		12/280	12/400	13/400
Max. service temperature [°C]		1200	1200	1300
Chemical analysis [%]	Al ₂ O ₃	1	1	1
	SiO ₂	72	64	69
	CaO	27	35	30
Bulk density [kg/m ³]		280	400	400
Linear shrinkage [%] after 24 hrs. at	1000° C	2.0	0.6	0.6
	1100° C	2.5	1.0	1.0
	1200° C	2.9	1.5	1.5
	1300° C	–	–	2.0
Thermal conductivity [W/mK] at	800° C	0.23	0.22	0.22
	1000° C	0.32	0.30	0.30
	1200° C	0.44	0.39	0.39
Nomenclature		CVS	CVS	CVS
1 Dried (standard)		121/280	121/400	131/280
2 Surface hardened		122/280	122/400	132/280
3 Completely hardened		123/280	123/400	133/280
4 Fired		124/280	124/400	134/280
5 Fired and surface hardened		125/280	125/400	135/280
6 Fired and completely hardened		126/280	126/400	136/280

Product Description

Kerform CVS is manufactured by a vacuum-forming process using high-grade alkaline earth silica fibres, fillers and both organic and inorganic binders. The wide range of fibre lengths, fillers and finishing processes available determine the applications of the shapes. Kerform CVS is designed for use exclusively in dry, non-corrosive atmospheres.

Kerform CVS is available either as boards or in complex geometries and can be produced with bulk densities up to 1500 kg/m³. The fibres used in these products have high biological solubility. For further information refer to the products **Kerform AL**, **CS** and **CU**. A wide range of solutions is available for specific customer requirements.

Applications

Kerform CVS is used in household appliances and boiler plants for backing insulation as well as in non-ferrous metallurgy.

For special applications, please contact one of our sales offices; we will be pleased to be of assistance.

Standard Dimensions

Boards: Length/Width: 1000 x 500 mm
Thickness: 5 – 100 mm

Cylinders: Diameter: 12 – 600 mm
Length: 50 – 600 mm

Shapes: To customers' requirements

We are in the position to supply even the most complex geometries made to your specifications.

Kerform KVF, KV

Vacuum-formed Products

Type		Kerform KVF						Kerform KV		
		101	121	141	151	161	161 HA	10	12	14
Binder system		Organic						Inorganic		
Max. service temperature [°C]		1000	1260	1400	1500	1600	1600	1000	1260	1400
Chemical analysis [%]	Al ₂ O ₃	25	45	50	58	78	98	25	35	40
	SiO ₂	62	54	49	41	21	2	62	64	59
Bulk density [kg/m ³]		> 160	> 160	> 160	> 140	> 100	> 100	250	250	250
Linear shrinkage [%] after 24 hrs. at	1000° C	2.0	2.0	–	–	–	–	3.0	2.0	–
	1100° C	–	3.0	2.0	–	–	–	–	3.0	2.0
	1250° C	–	–	3.0	2.0	–	–	–	–	3.0
	1400° C	–	–	–	3.0	1.0	1.5	–	–	–
	1500° C	–	–	–	–	2.0	2.8	–	–	–
Thermal conductivity [W/mK] at	400° C	0.07	0.07	0.07	0.07	0.07	0.08	0.06	0.06	0.06
	600° C	0.12	0.12	0.12	0.12	0.12	0.15	0.10	0.10	0.10
	800° C	0.18	0.18	0.18	0.18	0.18	0.24	0.15	0.15	0.15
	1000° C	0.25	0.25	0.25	0.25	0.25	0.34	0.22	0.22	0.22
	1200° C	–	–	0.35	0.35	0.35	0.56	–	–	0.30
	1400° C	–	–	–	0.48	0.48	0.84	–	–	–
Nomenclature		KVF	KVF	KVF	KVF	KVF	KVF	KV	KV	KV
0 Wet felt		–	–	–	–	–	–	100	120	140
1 Dried		101	121	141	151	161	161 HA	101	121	141
2 Surface hardened		–	–	–	–	–	–	102	122	142
3 Completely hardened		–	–	–	–	–	–	103	123	143

Product Description

Kerform KV and **Kerform KVF** are manufactured by a vacuum-forming process using high-grade alumina-silica and alumina fibres and both organic and inorganic binders. These products are chemically neutral and are resistant to most acids and alkalis, except hydrochloric acids, phosphoric acids and concentrated alkalis. Kerform KVF can be produced with bulk densities up to 200 kg/m³, and Kerform KV with bulk densities up to 350 kg/m³. The wide range of fibre lengths and finishing processes available determine the various applications of the material. These products are available either as board or in complex geometries.

Applications

Kerform KV is used in household appliances, heater coil supports (kitchen stoves), laboratory equipment and for backing insulation. **Kerform KVF** is used for sealing, expansion compensation applications and for the manufacture of felt modules.

For special applications, please contact one of our sales offices.

Standard Dimensions

Boards:	Length/Width:	1000 x 500 mm
	Thickness:	5 – 100 mm
Cylinders:	Diameter:	12 – 600 mm
	Length:	50 – 600 mm
Shapes:	To customers' requirements	

We are in the position to supply even the most complex geometries made to your specifications.

Kerform KVS

Vacuum-formed Products

		06	08	10	101/700 ¹⁾	12	14	14/301	15
Binder system									
Max. service temperature [°C]		600	800	1000	1000	1260	1400	1400	1500
Chemical analysis [%]	Al ₂ O ₃	15	25	35	36	50	55	50	60
	SiO ₂	48	50	52	54	49	44	39	39
	others	–	–	–	–	–	–	ZrO ₂ 10	–
Bulk density [kg/m ³]		300	300	300	700	300	300	300	300
Linear shrinkage [%] after 24 hrs. at	600° C	1	1	–	–	–	–	–	–
	800° C	–	2	–	–	–	–	–	–
	900° C	–	–	1	0.3	–	–	–	–
	1000° C	–	–	2	0.4	1	–	–	–
	1100° C	–	–	–	0.5	2	1	1	–
	1250° C	–	–	–	–	–	2	2	1
	1400° C	–	–	–	–	–	–	–	1
	1500° C	–	–	–	–	–	–	–	2
	1600° C	–	–	–	–	–	–	–	–
	1700° C	–	–	–	–	–	–	–	–
	1750° C	–	–	–	–	–	–	–	–
	1800° C	–	–	–	–	–	–	–	–
Thermal conductivity [W/mK] at	200° C	0.08	0.09	0.09	0.18	0.09	0.09	0.09	0.08
	400° C	0.11	0.12	0.11	0.21	0.12	0.12	0.11	0.10
	600° C	0.15	0.15	0.14	0.24	0.15	0.15	0.15	0.14
	800° C	–	0.20	0.19	0.28	0.19	0.19	0.19	0.18
	1000° C	–	–	0.27	0.32	0.25	0.24	0.24	0.23
	1200° C	–	–	–	–	0.34	0.31	0.30	0.30
1400° C	–	–	–	–	–	0.40	0.39	0.39	
Thermal shock resistance, according to standard brick process [n]		–	–	–	–	–	–	–	–
Nomenclature		KVS	KVS	KVS	KVS	KVS	KVS	KVS	KVS
0 Wet felt		060	080	100	–	120	140	140/301	150
1 Dried		061	081	101	101/700	121	141	141/301	151
2 Surface hardened		062	082	102	–	122	142	142/301	152
3 Completely hardened		063	083	103	–	123	143	143/301	153
4 Fired (standard)		064	084	104	–	124	144	144/301	154
5 Fired and surface hardened		065	085	105	–	125	145	145/301	155
6 Fired and completely hardened		066	086	106	–	126	146	146/301	156

All types can also be produced high fired (HF) in half standard size.

1) Only available as boards or parts thereof.

2) “+” growth.

15/301	16	16/301	16/302	17/301	17/400	17/402	17/700 ¹⁾	18/400	18/700 ¹⁾
Organic / Inorganic									
1500	1600	1600	1600	1700	1750	1700	1750	1800	1800
28	65	28	78	85	81	84	86	80	82
20	34	20	22	14	19	15	14	20	18
Si ₃ N ₄ 51	–	ZrO ₂ 51	–	–	–	–	–	–	–
300	300	300	300	300	400	400	700	400	700
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
1	1	–	–	–	–	–	–	–	–
1	1	1	–	0.8	–	0.2	–	–	–
–	2	2.8	+1 ²⁾	1.3	+0.2 ²⁾	0.3	0.5	–	–
–	–	–	–	2.4	0.3	1.2	0.5	0.1	0.1
–	–	–	–	–	1.0	–	0.7	0.4	0.2
–	–	–	–	–	–	–	–	0.8	0.7
–	0.16	–	–	–	–	–	–	–	–
–	0.17	–	–	–	–	–	–	–	–
–	0.18	–	–	–	–	–	–	–	–
0.16	0.20	0.15	–	–	–	–	–	–	–
0.22	0.26	0.18	0.23	0.21	0.24	0.24	0.33	0.25	0.33
0.30	0.34	0.23	0.28	0.25	0.28	0.27	0.35	0.29	0.35
0.40	0.44	0.28	0.34	0.29	0.35	0.32	0.38	0.33	0.38
–	–	–	–	> 30	> 11	> 30	4	> 44	4
KVS	KVS	KVS	KVS	KVS	KVS	KVS	KVS	KVS	KVS
150/301	160	160/301	160/302	–	–	–	–	–	–
151/301	161	161/301	161/302	171/301	171/400	171/402	171/700	181/400	181/700
152/301	162	162/301	162/302	172/301	172/400	172/402	172/700	182/400	182/700
153/301	163	163/301	163/302	–	–	–	–	–	–
154/301	164	164/301	164/302	174/301	174/400	174/402	174/700	184/400	184/700
155/301	165	165/301	165/302	175/301	175/400	175/402	175/700	185/400	185/700
156/301	166	166/301	166/302	–	–	–	–	–	–

Kerform KVS

Vacuum-formed Products

Product Description

Kerform KVS is manufactured by a vacuum-forming process using high-grade alumina-silica and alumina fibres, fillers and organic and inorganic binders. These products are chemically neutral and are resistant to most acids and alkalis, except hydrochloric acids, phosphoric acids and concentrated alkalis. Kerform KVS can be produced with bulk densities up to 1500 kg/m³. The wide range of fibre lengths, fillers and finishing processes available determine the various applications of the material. This product is available either as board or in complex geometries.

Applications

Kerform KVS is used in furnace construction (from laboratory furnaces to industrial plants) in dental furnaces, for backing insulation, in the boiler industry, in household appliances and in microwave ovens.

For special applications, please contact one of our sales offices; we will be pleased to be of assistance.

Standard Dimensions

Boards: Length/Width: 1000 x 500 mm
Thickness: 5 – 100 mm

Cylinders: Diameter: 12 – 600 mm
Length: 50 – 600 mm

Shapes: To customers' requirements

We are in the position to supply even the most complex geometries made to your specifications.

Kerform KVS 101/700, KVS 17 and KVS 18 are available in the following standard dimensions:

Boards: Length/Width: 900 x 600 mm
Thickness: 25 – 50 mm

Cylinders: Diameter: 12 – 600 mm
Length: 50 – 600 mm

Shapes: To customers' requirements

Applies all quoted products:

For applications in corrosive atmospheres and close to maximum service temperatures we recommend consultation with our technical departments. The technical data are reference values, checked according to recognized test standards. Detailed descriptions are given in our data sheets. Other types upon request. We reserve the right to carry out amendments and alterations without prior notice.

Kerform KVR High Alumina Vacuum-formed Products

		16/300	16/400	16/700 ¹⁾	16/302 ²⁾	16/402 ²⁾	16/702 ¹⁾²⁾
Max. service temperature [°C]		1600	1600	1600	1600	1600	1600
Chemical analysis [%]	Al ₂ O ₃	> 96	> 96	> 96	> 98	> 98	> 98
	SiO ₂	< 4	< 4	< 4	< 2	< 2	< 2
Bulk density [kg/m ³]		300	400	700	300	400	700
Linear shrinkage [%] after 24 hrs. at	1400° C	0.8	0.6	1.2	0.8	0.8	0.8
	1500° C	1.6	1.2	1.9	1.2	1.2	1.2
	1600° C	2.3	2.1	2.9	5.4	5.4	4.1
Thermal conductivity [W/mK] at	1000° C	0.18	0.23	0.28	0.22	0.18	0.28
	1200° C	0.21	0.26	0.30	0.26	0.21	0.30
	1400° C	0.24	0.29	0.31	0.29	0.24	0.31
Thermal shock resistance according to standard brick process [n]		32	20	> 75	9	8	5
Nomenclature		KVR	KVR	KVR	KVR	KVR	KVR
1 Dried		161/300	161/400	161/700	161/302	161/402	161/702
2 Surface hardened		162/300	162/400	162/700	162/302	162/402	162/702
3 Completely hardened		163/300	163/400	163/700	163/302	163/402	163/702
4 Fired (standard)		164/300	164/400	164/700	164/302	164/402	164/702
5 Fired and surface hardened		165/300	165/400	165/700	165/302	165/402	165/702
6 Fired and completely hardened		166/300	166/400	166/700	166/302	166/402	166/702

All types can also be produced high fired (HF) in half standard size.

1) Available only as boards.

2) Available only in half standard size.

Product Description

Kerform KVR is manufactured by a vacuum-forming process using high-grade alumina fibres, fillers and organic and inorganic binders. These products are chemically neutral, resistant to most acids and alkalis, except hydrochloric acids, phosphoric acids and concentrated alkalis.

Kerform KVR is particularly suitable for corrosive and reducing atmospheres (e.g. H₂, CO) and vacuums, and can be supplied in bulk densities up to 1500 kg/m³. The wide range of fibre lengths, fillers and finishing processes available determine the various applications of the material. This product is available either as board or in complex geometries.

Applications

Kerform KVR is used in vacuum furnaces, annealing furnaces for steel and other alloys, in crystal growing furnaces and fuel cells.

For special applications, please contact one of our sales offices; we will be pleased to be of assistance.

Standard Dimensions

Boards: Length/Width: 900 x 600 mm
Thickness: 25 – 50 mm

Cylinders: Diameter: 12 – 600 mm
Length: 50 – 600 mm

Shapes: To customers' requirements

We are in the position to supply even the most complex geometries made to your specifications.

Kerform AL, CS, CU

		Kerform AL 126	Kerform CS 136	Kerform CU 146	Kerform CU 156
Max. service temperature [°C] when in contact with molten non-ferrous metals		1100	1200	1300	1400
Max. service temperature [°C] when used as thermal insulation		1200	1300	1400	1500
Chemical analysis [%]	Al ₂ O ₃	22	1	11	14
	SiO ₂	65	61	56	33
	others	BaO 6	CaO 18 BaO 12	SiC 31	SiC 52
Bulk density [kg/m ³]		850	800	700	700
Linear shrinkage [%] after 24 hrs. at	800° C	0.1	–	–	–
	1000° C	1.0	0.4	–	–
	1100° C	1.5	0.8	0.1	–
	1200° C	–	1.5	0.2	0.1
	1300° C	–	–	0.3	0.2
	1500° C	–	–	–	0.4
Thermal conductivity [W/mK] at	400° C	0.15	0.11	0.33	0.19
	600° C	0.16	0.15	0.38	0.23
	800° C	0.17	0.21	0.45	0.28
	1000° C	–	0.29	0.52	0.33
	1200° C	–	–	0.61	0.41
Recommended Kerathin adhesive		Fibreplast AL	Adhesive 1700	Adhesive CU	Adhesive CU
Recommended Kerathin coating		Coating AL	Coating HA	Coating CU	Coating CU
Recommended Kerathin repair mastic		Fibreplast AL	Fibreplast AL	Fibreplast CU	Fibreplast CU

Vacuum-formed Products for the Non-ferrous Metal Industry

Product Description

Kerform AL, CS and CU are products for use in contact with molten non-ferrous metals.

Special types of Kerform have been developed for the various compositions of molten non-ferrous metals. These products are inorganic, asbestos-free, have good mechanical stability, are homogeneous, can be machined, and are available in bulk densities up to 1500 kg/m³. They are not wetted by the respective metals.

Kerform AL and **CS** are vacuum-formed ceramic fibre insulating materials suitable for the transport and distribution of aluminium, tin, zinc, lead and their alloys.

Kerform CU is used for copper and its alloys.

Standard Dimensions

Boards: Length/Width: 1000 x 500 mm
Thickness: 5 – 100 mm

Cylinders: Diameter: 12 – 600 mm
Length: 50 – 600 mm

Shapes: To customers' requirements

We are in the position to supply even the most complex geometries made to your specifications.

Applications

Kerform AL, CS and CU are used for troughs, pipes and exhaust tubes, floats, crucibles, transport ladels and holding furnaces for non-ferrous metals.

For special applications, please contact one of our sales offices; we will be pleased to be of assistance.

Applies to all quoted products:

For applications in corrosive atmospheres and close to maximum service temperatures we recommend consultation with our technical departments. The technical data are reference values, checked according to recognized test standards. Detailed descriptions are given in our data sheets. Other types upon request. We reserve the right to carry out amendments and alterations without prior notice.

Kerasetter

Setter and Construction Auxiliaries

		KVS 124/1000	KVS 154/1000	KVR 164/1000	KVS 174/1000	KVS 174/1500
Max. service temperature [°C]		1200	1500	1500	1700	1700
Chemical analysis [%]	Al ₂ O ₃	75	82	99	89	90
	SiO ₂	25	18	1	11	10
Bulk density [kg/m ³]		1000	1000	1000	1000	1500
Linear shrinkage [%] ¹⁾ after 24 hrs. at	1000° C	0.6	–	–	–	–
	1100° C	1.2	0.0	0.0	–	–
	1200° C	1.5	0.0	0.1	–	–
	1400° C	–	0.1	0.2	0.0	+0.1 ¹⁾
	1500° C	–	0.0	1.5	+0.9 ¹⁾	+0.9 ¹⁾
	1600° C	–	–	–	+0.5 ¹⁾	+0.3 ¹⁾
	1700° C	–	–	–	+0.2 ¹⁾	+0.4 ¹⁾
Thermal conductivity [W/mK] at	1000° C	0.40	0.40	0.35	0.45	0.70
	1200° C	0.43	0.43	0.36	0.45	0.71
	1400° C	–	0.46	0.40	0.50	0.72

1) “+” growth

Product Description

Kerasetters are manufactured by a vacuum-forming process using high-grade alumina silica and alumina fibres, fillers and organic and inorganic binders.

These products are chemically neutral, resistant to most acids and alkalis, except hydrochloric acids, phosphoric acids and concentrated alkalis.

Kerasetter KVR are particularly recommended for corrosive and reductive atmospheres (e.g. H₂, CO) as well as vacuum and can be produced with bulk densities up to 1500 kg/m³. The wide range of fibre lengths, fillers and finishing processes available determine the various applications of the materials. These products are available as board.

Applications

Kerasetters are used as a setter material in the dental, electronics and ceramic industries and as a structural support material in the construction of furnaces and laboratory equipment.

Standard Dimensions

Boards: Length/Width: 600 x 450 mm
Thickness: 10 – 30 mm

We are in the position to supply even the most complex geometries made to your specifications.

Applies to all quoted products:

For applications in corrosive atmospheres and close to maximum service temperatures we recommend consultation with our technical departments. The technical data are reference values, checked according to recognized test standards. Detailed descriptions are given in our data sheets. Other types upon request. We reserve the right to carry out amendments and alterations without prior notice.

Kerheat

Vacuum-formed Products with Embedded Heating Elements

Technical Data	Kerheat A	Kerheat B	Kerheat C	Kerheat D	Kerheat E
Length [mm]	600	600	500	500	300
Width [mm]	440	300	500	300	300
Thickness [mm]	100	100	100	100	100
Output [W]	3600	1800	3600	1800	900

Types of delivery					
230 Volt	●		●		
190 Volt	●		●		
127 Volt		●		●	
110 Volt		●		●	
95 Volt		●		●	
55 Volt					●

Product Description

Kerheat are vacuum-formed ceramic fibre components with integrated heating elements. The maximum heating element temperature is 1300° C. This is normally approx. 50 K above furnace temperature.

The Kerheat vacuum-formed shape itself is porous, therefore the atmosphere of the furnace can diffuse into the vacuum-formed shape. Therefore the vacuum-formed shape does not protect the heating element from an aggressive furnace atmosphere.

For reducing furnace atmospheres the heating element should be pre-oxidized. Carbon deposits on the hot sides of the Kerheat vacuum-formed shape can create electrical conductive bridges between the heating elements. To avoid this, carbon deposits must be burned out at regular intervals with access of air at approx. 1000° C. In hydrogen the heating element can be used up to a temperature of 1250° C. The thermal conductivity of the vacuum-formed shape increases as the hydrogen concentration rises. Vacuum-formed shapes with alumina fibres (**Altra B 97**) should be used in reducing atmospheres over 950° C. In pure nitrogen atmospheres the maximum service temperature of the heating element is 950° C.

For operation under vacuum, the service temperature is limited to around 1000° C. The service temperature falls as the vacuum is increased.

With high furnace temperatures, long service life of the heating element can be achieved with good pre-oxidation and regularly repeated intermediate oxidation during operation.

The bulk density of the vacuum-formed shape is 300 kg/m³. The maximum wall thickness for boards is 100 mm, while with pipes, half-round sections and muffles thicknesses up to 150 mm can also be supplied, depending on the type of fibre required.

Standard Dimensions

Boards:	Up to 1000 x 1000 mm
Cylinders:	Up to 700 mm outer diameters Lengths up to 500 mm
Half-shells:	Up to 1000 mm outer diameters Lengths up to 1000 mm
Wall thickness:	50 – 100 mm
Power density:	up to 15 kW/m ²

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