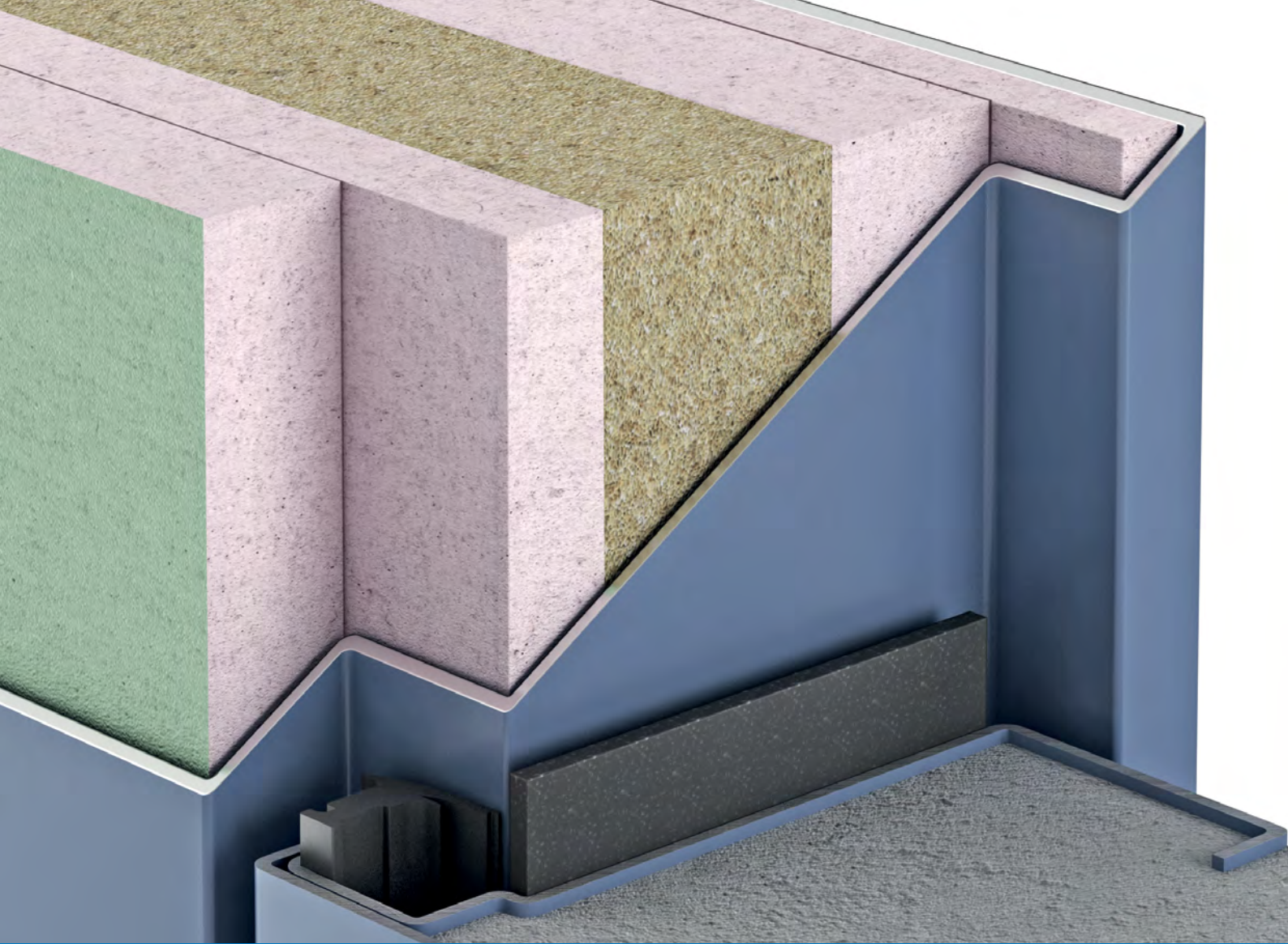




KUHN BRANDSCHUTZ
KOMPONENTEN

Components for the processing
industry especially the
door industry



ROLFKUHN GMBH
PASSIVER TECHNISCHER BRANDSCHUTZ



ROLFKUHN GMBH
PASSIVER TECHNISCHER BRANDSCHUTZ



Content

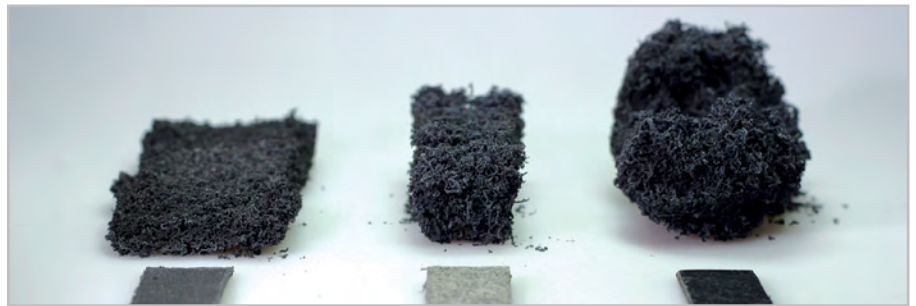
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Things to know about intumescent materials.

Building materials are called reactive if they react on physical or chemical temperature influences. In the area of passive fire protection, there is a distinction between intumescent and energy absorbing building materials, where as intumescent building materials may have an energy absorbing effect, too. Each building material is available with different designs and material properties. Respecting their particular technical feature in the construction of building components, one may achieve very flexible solutions in averting the onset of fire and the spread of fire.



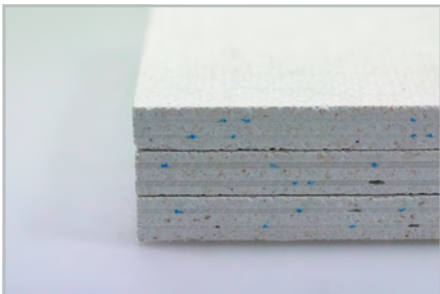
Due to the intumescent effect, openings and joints in buildings may be sealed hermetically.



The foam of some of the intumescent materials offers extra insulating effects.

The technical term “intumescent” (from Latin: intumescere = swell) describes the most important feature of this kind of material: the material swells and chars when exposed to flames. In addition, it has insulating properties. Thus, construction openings such as spaces between fire stopping doors and their frames, free spaces in door locks or glazings are sealed hermetically in the event of a fire.

Another important aspect of the intumescent material is its pressure while expanding. The pressure defines the power with which an opening needs to be sealed. Therefore, one has to choose carefully the right intumescent material for each application as too much pressure may destroy the constructional element and finally would be counterproductive, or in contrast, low pressure may not perform successfully in the event of a fire. In contrast to that, energy absorbing materials consume energy due to their endothermal reaction under temperature influence. Most of them set the contained water free. The high warmth capacity of water leads to the desired effect of cooling adjacent materials.



Picture: Kerafix® Coolmax

By absorbing energy, less heat gets transmitted from the fire side to the unexposed face. This condition is more effective than merely a “cooling effect”.

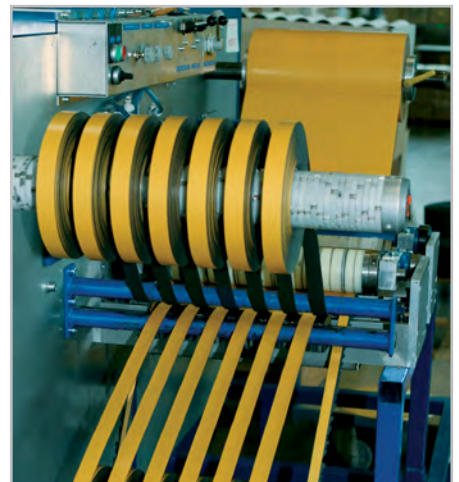
„All from one hand“ – our responsibility is your advantage.

Over 30 years market experience lead our behaviour. At this time we adapted our development of fire protection solutions to the needs of our customers. Owing to the production and the distribution on site we deliver everything from a single source.

With the allocation into the different product areas you'll profit of synergy effects, which we present as an variety of custom-made fire protection solutions. The effects of this synergys not least reflected in our modern machinery park which allows us to manufacture intumescent building materials and fire protection boards in nearly every possible customized way.



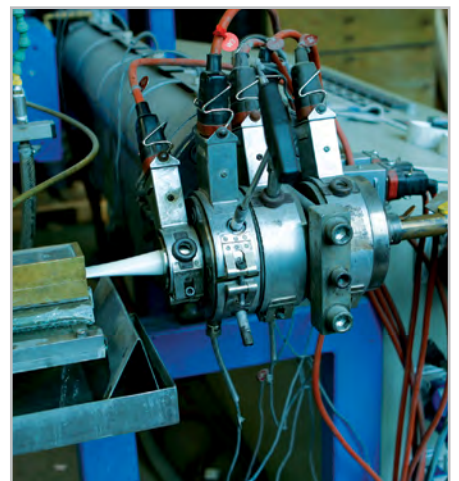
The factory of the Rolf Kuhn GmbH in Erndtebrück.



Customized cutting machine for strip material



Modern CNC controlled board-separating saw for individual and fully automatic cutting processes with extreme accuracy.

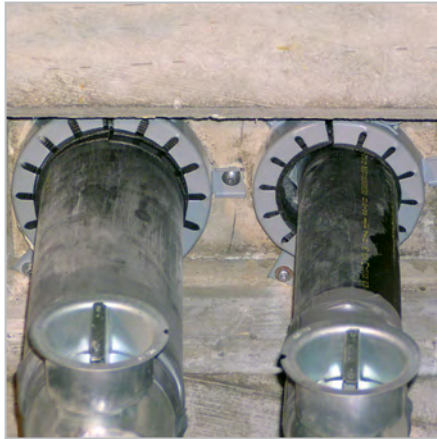


Different extruders for the various solutions of covers for intumescent strips

Reactive building materials open up more and more application areas.



Dolle



Kuhn Brandschutz Systeme



MBB



Kuhn Brandschutz Systeme



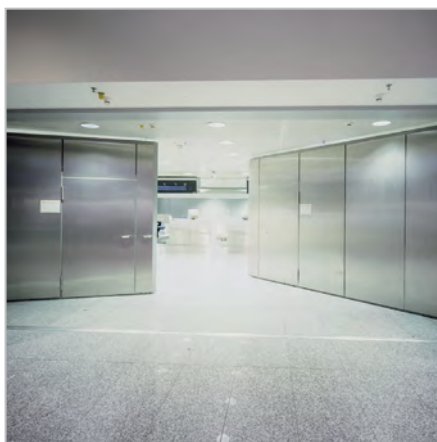
Stik



Strulik



Hueck



System Schröders



Sturm



Sturm



Foseco



Kuhn Brandschutz Systeme



Format



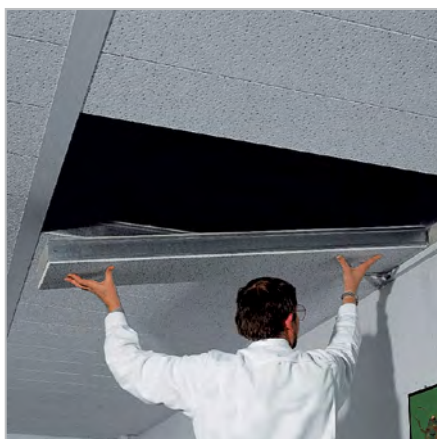
Riegelhof & Gärtner



asecos



Sturm



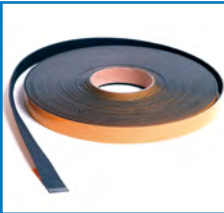
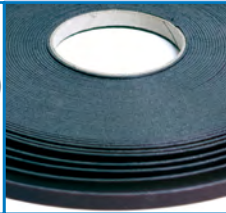
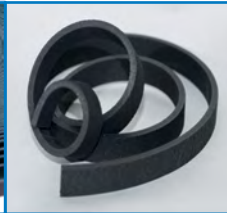
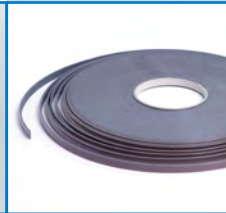
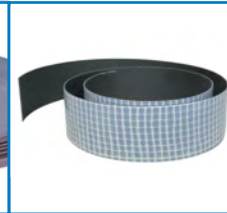
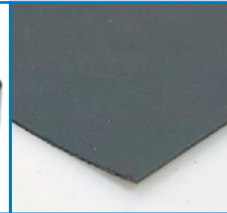
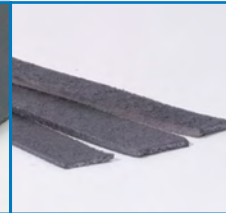
Knauf-AMF



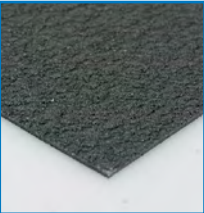
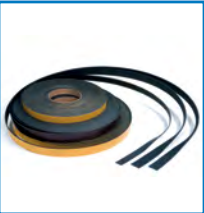
System Schröders

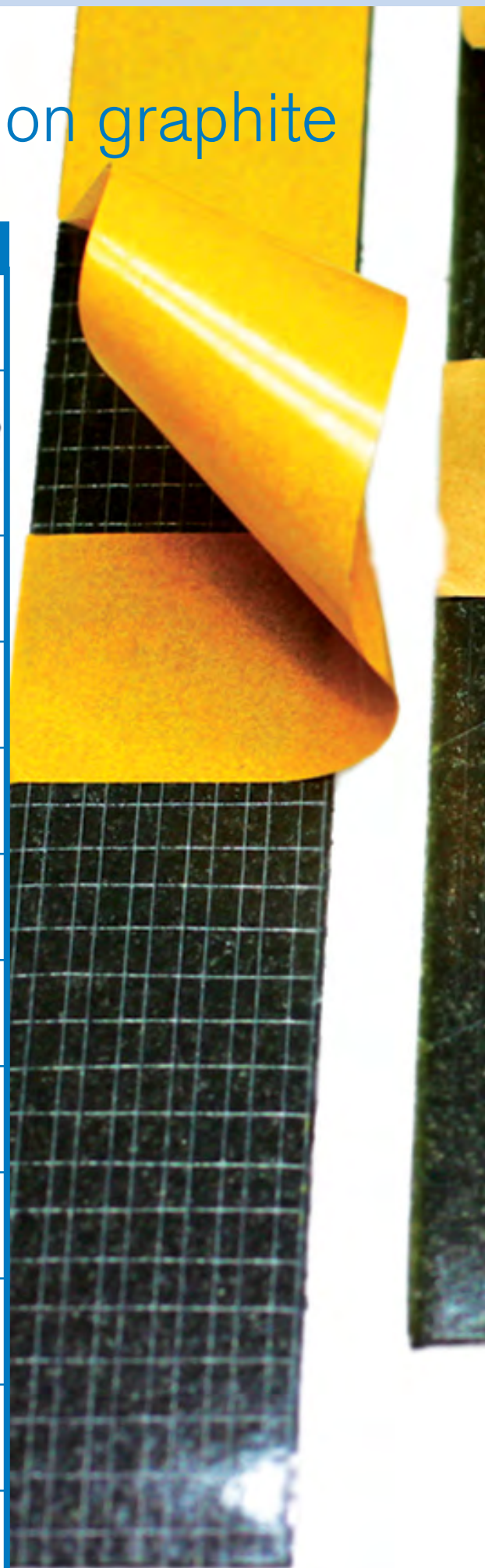
Reactive products based on graphite

PRODUCT NAME	Interdens® Heatseal	Kerafix® Blähpapier N	Kerafix® Flexpan 200 (ROKU® Strip L 110)	Kerafix® Flexpan 200 L (ROKU® Strip L 80)	Kerafix® Flexpan 200 NG-A	Kerafix® Flexpan 200 NG-G
PRODUCTS						
OFFICIAL VERIFICATION	Z-19.11-630	Z-19.11-1506	Z-19.11-1369 ETA-12/0152 Z 13064	Z-19.11-1369 ETA-12/0152	–	–
BUILDING MATERIAL CLASSIFICATION	B2 as to DIN 4102-1	B2 as to DIN 4102-1	B2 as to DIN 4102-1 E as to DIN EN 13501-1	B2 as to DIN 4102-1 E as to DIN EN 13501-1	E as to DIN EN 13501-1 (in preparation)	E as to DIN EN 13501-1 (in preparation)
MATERIAL STRUCTURE	Solid plate material	Flexible roll material	Solid flexible roll material	Solid flexible roll material	Solid flexible roll material	Solid flexible roll material
GROSS DENSITY [kg/m³]	675 up to 875 (±10 %)	800 (±10 %)	980 up to 1200	700 up to 900	Approx. 1100 to 1300	Approx. 1100 to 1300
START EXPANSION TEMPERATURE [°C]	From approx. 150	From approx. 200	From approx. 190	From approx. 190	From approx. 180	From approx. 200
EXPANSION RATE [x-times]	8 up to 16-times (350 °C; 30 Min; with load)	9 up to 17-times (450 °C; 30 Min; with load)	14 up to 28-times (450 °C; 30 Min; without load)	9 up to 20-times (450 °C; 30 Min; without load)	33-times (450 °C; 30 Min; without load)	15-times (450 °C; 30 Min; without load)
EFFECT DIRECTION	Mainly flat	Flat	Three-dimensional	Three-dimensional	Three-dimensional	Three-dimensional
INFLATABLE BODY	Stable char	Soft cohesive char	Soft cohesive char	Soft cohesive char	Soft coherent char	Soft coherent char
PRESSURE [N/mm²]	Minimum 0,6	Minimum 0,25	Minimum 0,4	Minimum 0,3	Minimum 1,0	Minimum 0,5
THERMAL CONDUCTIVITY [W/mK]	–	–	0,955	–	–	–

Kerafix® Flexpan 200 SP (ROKU® Strip L 110) with delayed expansion	Kerafix® Flexpan 200 W (ROKU® Strip L 110 W)	Kerafix® Flexpan XF	Kerafix® Flexpress 100 (ROKU® Strip L 110) with early expansion	Kerafix® Flexpress 450 G	Kerafix® Flexstop 200	Kerafix® Flexing 100 (ROKU® Strip F 115)
						
–	Z-19.11-1369 ETA-12/0152	–	Z-19.11-1488 ETA-13/0109	Z-19.11-2097	–	–
B2 as to DIN 4102-1 E as to DIN EN 13501-1	B2 as to DIN 4102-1 E as to DIN EN 13501-1	–	B2 as to DIN 4102-1 E as to DIN EN 13501-1	B2 as to DIN 4102-1 E as to DIN EN 13501-1	–	B2 as to DIN 4102-1
Solid flexible roll material	Soft roll material	Solid flexible roll material	Solid flexible roll material	Solid flexible roll material	Solid flexible roll material with smooth surface	Solid flexible roll material
1200 [(±10 %) at 0,9 mm]	950 up to 1100	1170 up to 1430	1315 (±10 %)	1288 [(±10 %) at 0,8 mm]	1100 to 1300	1170 [(±10 %) at 1 mm]
From approx. 220	From approx. 170	From approx. 200	From approx. 140	From approx. 160	From approx. 180	From approx. 190
14 up to 25-times (450 °C; 30 Min; without load)	9 up to 18-times (450 °C; 30 Min; without load)	13 up to 30-times (350 °C; 30 Min; with load)	22 up to 30-times (450 °C; 30 Min; without load)	12 up to 22,5-times (550 °C; 30 Min; with load)	10-times (450 °C; 30 Min; without load)	8 up to 15-times (350 °C; 30 Min; without load)
Three- dimensional	Three- dimensional	Three- dimensional	Three- dimensional	–	Three- dimensional	Three- dimensional
Soft cohesive char	Soft cohesive char	Soft cohesive char	Soft cohesive char	–	Stable char	Stable char
Minimum 0,7	Minimum 0,4	Minimum 0,2 to 0,6	Minimum 0,55	Minimum 0,6	Minimum 0,5	Minimum 0,6
–	–	–	0,615	–	–	–

Reactive products based on graphite

PRODUCT NAME	Kerafix® Flexting 250	Kerafix® Flextrem 100 (ROKU® Strip M 130)	ROKU® Strip
PRODUCTS			
OFFICIAL VERIFICATION	–	Z-19.11-1652 ETA-13/0116	Z-19.11-1190 ETA-10/0117 Z 10435
BUILDING MATERIAL CLASSIFICATION	–	B2 as to DIN 4102-1 E as to DIN EN 13501-1	B2 as to DIN 4102-1 E as to DIN EN 13501-1
MATERIAL STRUCTURE	Solid flexible roll material	Solid flexible roll material	Solid flexible roll material
GROSS DENSITY [kg/m³]	1300 [(±10 %) at 1,5 mm]	1370 [(±10 %) at 1 mm]	1200 [(±10 %) at 1 mm]
START EXPANSION TEMPERATURE [°C]	From approx. 200	From approx. 200	From approx. 190
EXPANSION RATE [x-times]	14-times (350 °C; 30 Min; without load)	37 up to 52-times (450 °C; 30 Min; without load)	18 up to 30-times (550 °C; 30 Min; with load)
EFFECT DIRECTION	Three-dimensional	Three-dimensional	Three-dimensional
INFLATABLE BODY	Soft slack char	Solid char	Solid stable char
PRESSURE [N/mm²]	Minimum 0,5	Minimum 0,75	Minimum 0,8
THERMAL CONDUCTIVITY [W/mK]	–	0,770	0,403

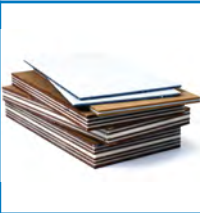


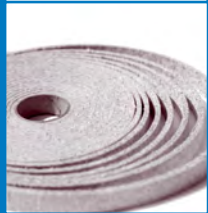


Reactive products based on phosphate,

PRODUCT NAME	Interdens® Typ 5 / Typ 15	Interdens® Typ 36	Kerafix® FXL 200 (ROKU® Tech NP 130)
PRODUCTS			
OFFICIAL VERIFICATION	Z-19.11-483	Z-19.11-484	Z-19.11-1661 ETA-13/0665
BUILDING MATERIAL CLASSIFICATION	B2 as to DIN 4102-1	B2 as to DIN 4102-1	B2 as to DIN 4102-1 E as to DIN EN 13501-1
MATERIAL STRUCTURE	Solid plate material	Solid plate material	Soft roll material
GROSS DENSITY [kg/m³]	Type 5: 700 to 915 (at 0,6 mm) Type 15: 800 to 1120 (at 1 mm)	1900 up to 2300 (at 1 mm)	1400 [(±10 %) at 1 mm]
START EXPANSION TEMPERATURE [°C]	From approx. 150	From approx. 150	From approx. 200
EXPANSION RATE [x-times]	35 up to 70-times (350 °C; 20 Min; with load)	40 up to 85-times (350 °C; 20 Min; without load)	35 up to 42-times (400 °C; 30 Min; without load)
EFFECT DIRECTION	Three-dimensional	Three-dimensional	Mainly flat
INFLATABLE BODY	Heat insulating layer	Heat insulating layer	Stable heat insulating layer
PRESSURE [N/mm²]	–	–	–
THERMAL CONDUCTIVITY [W/mK]	–	–	0,349

silicate and vermiculite

PRODUCT NAME	Palusol®	Palusol® SW	Kerafix® Sosilit
PRODUCTS			
OFFICIAL VERIFICATION	Z-19.11-14	Z-19.11-14	–
BUILDING MATERIAL CLASSIFICATION	A2 as to DIN 4102-1 A2 as to DIN EN 13501-1	B2 as to DIN 4102-1	A2 as to DIN 4102-1
MATERIAL STRUCTURE	Solid plate material from 20 °C to 40 °C flexible	Solid plate material	Solid flexible plate material
GROSS DENSITY [kg/m³]	1580 [(±10 %) at 1,9 mm]	1580 [(±10 %) at 1,9 mm]	1400 [(±10 %) at 2 mm]
START EXPANSION TEMPERATURE [°C]	From approx. 100	From approx. 100	From approx. 100
EXPANSION RATE [x-times]	5 up to 8,5-times (550 °C; 10 Min; with load)	Depending on layers	10-times (350 °C; 30 Min; without load)
EFFECT DIRECTION	Flat	Flat	Flat
INFLATABLE BODY	Solid stable char	Solid stable char	Solid char
PRESSURE [N/mm²]	Minimum 0,85	Minimum 0,85	Minimum 0,8
THERMAL CONDUCTIVITY [W/mK]	0,800	0,800	–

Kerafix® Flexlit

Z-19.11-1759 ETA-13/0237
B2 as to DIN 4102-1 E as to DIN EN 13501-1
Soft roll material
620 [(±8 %) at 5 mm]
From approx. 350
2 up to 5,5-times (400 °C; 30 Min; with load)
Three-dimensional
Soft cohesive char
Minimum 0,1 to 0,25
0,057

Profiles / moulded components

PRODUCT NAME	Kerafix® Everseal P N	Kerafix® Everseal T N	ROKU® Lock Housing Insulations	ROKU® Solutions for in- side door closers
PRODUCTS				
OFFICIAL VERIFICATION	–	Z-19.11-2068	Physical properties according to the material. Custom moulded parts.	Intumescent packs made of ROKU® Strip for Dorma ITS 96 GEZE Boxer ECO Multigenius door closers. Customized solutions possible!
BUILDING MATERIAL CLASSIFICATION	E as to DIN EN 13501-1 (in preparation)	B2 as to DIN 4102-1 E as to DIN EN 13501-1		
MATERIAL STRUCTURE	Soft flexible material	Soft flexible material		
GROSS DENSITY [kg/m³]	980 (±10 %)	980 (±10 %)		
START EXPANSION TEMPERATURE [°C]	From approx. 220	From approx. 220		
EXPANSION RATE [x-times]	3 up to 6,5-times (450 °C; 30 Min; without load)	3 up to 6,5-times (450 °C; 30 Min; without load)		
EFFECT DIRECTION	Three- dimensional	Three- dimensional		
INFLATABLE BODY	Solid stable char	Solid stable char		
PRESSURE [N/mm²]	–	–		
THERMAL CONDUCTIVITY [W/mK]	0,189	0,166		

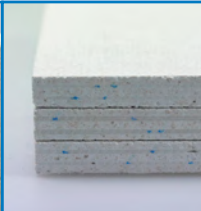
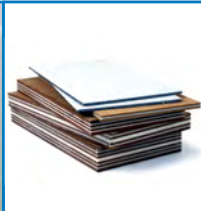
Pasty building materials

PRODUCT NAME	Kerafix® Firestop Putty	ROKU® 1000/1100 Sealant	ROKU® AC Sealant
PRODUCTS			
OFFICIAL VERIFICATION	Z-19.11-1746 ETA-13/0666	Z-19.11-1193	Z-19.11-1941
BUILDING MATERIAL CLASSIFICATION	B2 as to DIN 4102-1 E as to DIN EN 13501-1	B2 as to DIN 4102-1	B2 as to DIN 4102-1
MATERIAL STRUCTURE	Pasty material	Pasty material	Pasty material
GROSS DENSITY [kg/m³]	1390 (±10 %)	1250 (±10 %)	1360 to 1840
START EXPANSION TEMPERATURE [°C]	From approx. 140	From approx. 185	From approx. 200
EXPANSION RATE [x-times]	14,5 up to 20-times (450 °C; 30 Min; without load)	6 up to 10-times (550 °C; 30 Min; with load)	1,9 up to 5-times (400 °C; 30 Min; without load)
EFFECT DIRECTION	Three-dimensional	Three-dimensional	Flat
INFLATABLE BODY	Solid stable char	Solid stable char	Solid stable char
PRESSURE [N/mm²]	Minimum 0,8	Minimum 0,3	–
PH VALUE	–	6,5 to 7	–

Kerafix® Fire Stopping Silicone

P-HFM 00 4 147 U.S. Coast Guard 164.112/EC0736/ 118.292
B1 as to DIN 4102-1
Pasty material
Approx. 1000 (transparent); 1250 (colored) (±15 %)
–
–
–
–
–

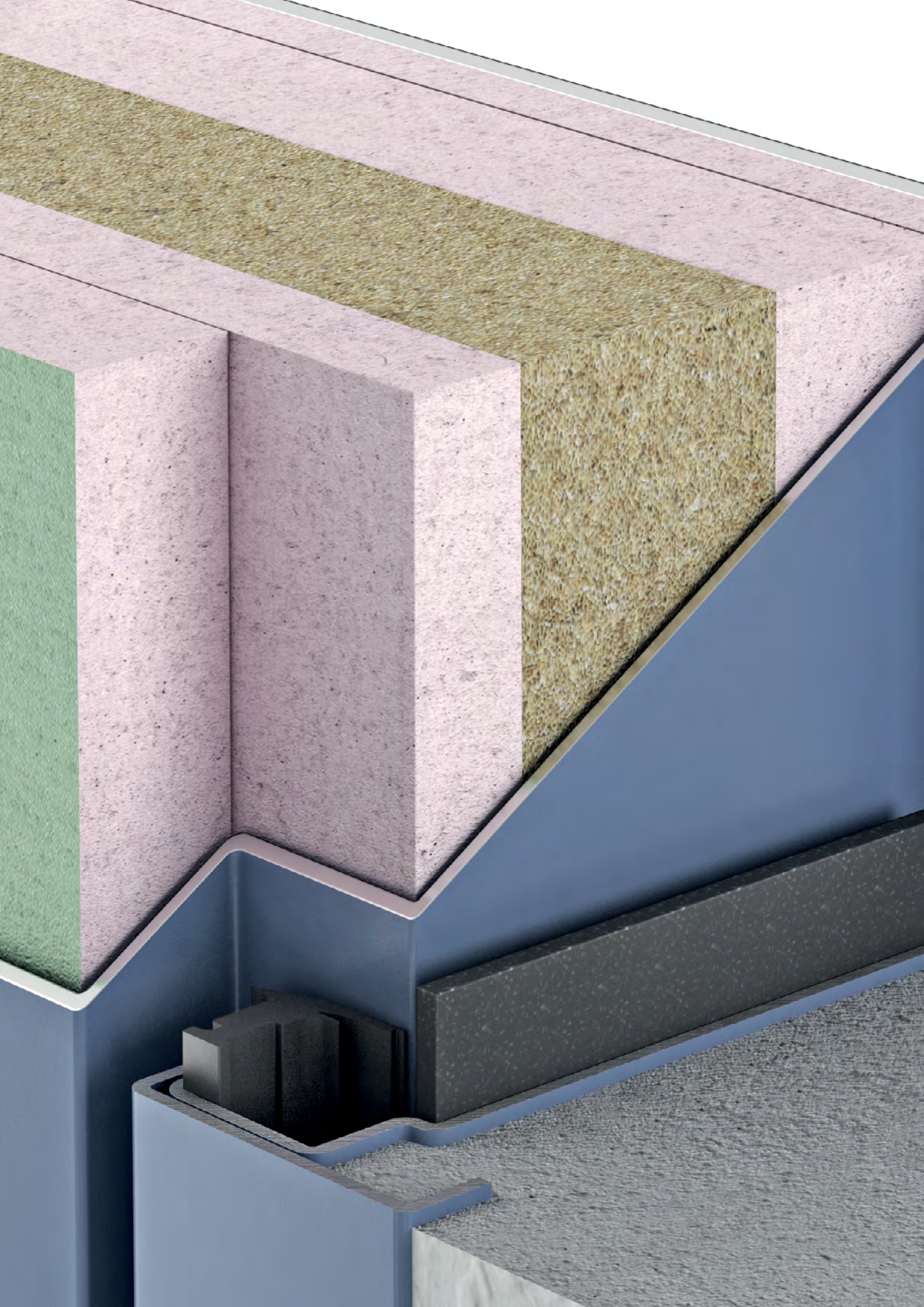
Fire stop boards / insulators

PRODUCT NAME	GKB and GKF Boards	Grenamat® A/AL	Grenamat® AR/AS	Kerafix® Coolmax	Palusol®	Palusol® SW
PRODUCTS						
OFFICIAL VERIFICATION	–	P-3481/918/11-MPA BS	–	P - BRA09 - 5135606	Z-19.11-14	Z-19.11-14
BUILDING MATERIAL CLASSIFICATION	A2-s1, d0 as to DIN EN 520 - A / as to DIN EN 520 - DF	A1 as to DIN 4102-1 A1 as to DIN EN 13501-1	A1 as to DIN 4102-1 A1 as to DIN EN 13501-1	A1 as to DIN 4102-1 A1 as to DIN EN 13501-1	A2 as to DIN 4102-1 A2 as to DIN EN 13501-1	B2 as to DIN 4102-1
MATERIAL STRUCTURE	Solid plate material	Solid plate material	Solid plate material	Solid plate material	Solid plate material from 20 °C to 40 °C flexible	Solid plate material
SURFACE STRUCTURE	Smooth surface on both sides	–	–	Sanded front and back side	Silicate core with epoxide cover	Silicate core with multiple layers of HDF
GROSS DENSITY [kg/m³]	Approx. 700 / 880 (±10 %)	500 to 800 (±10 %)	450 to 750 (±10 %)	1250 (±10 %)	1580 [(±10 %) at 1,9 mm]	1580 [(±10 %) at 1,9 mm]
MOISTURE CONTENT [mass-%]	0,6 to 1	–	2 to 3	25 to 30	–	–
THERMAL CONDUCTIVITY [W/mK]	0,250	0,120 / 0,090 to 0,160	0,120 to 0,196	0,266	0,800	0,800
PH VALUE	–	Approx. 5,5	Approx. 8	9 to 12	–	–
BENDING STRENGTH [N/mm²]	Approx. 4,7	3,6 to 4,1 / 1,5 to 6	1,5 to 4,6	–	–	–

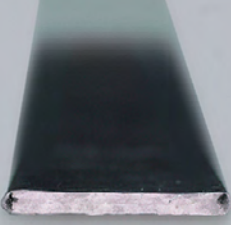
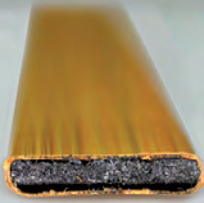
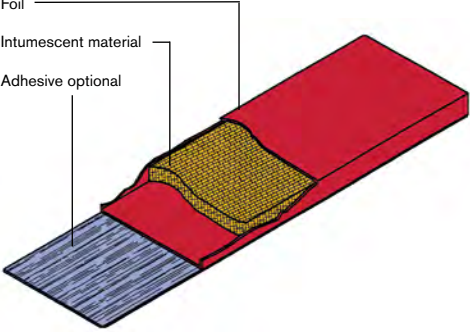
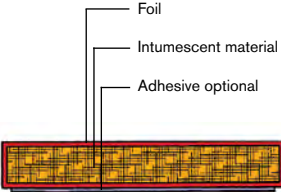
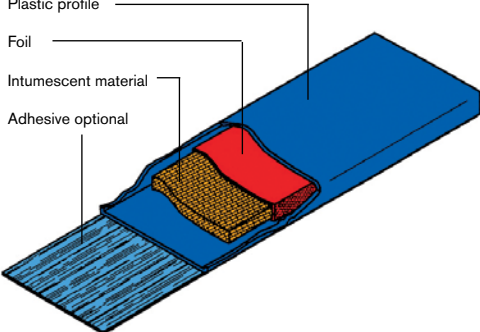
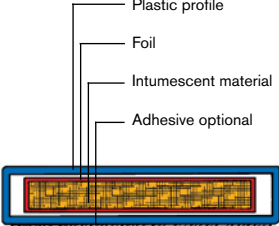
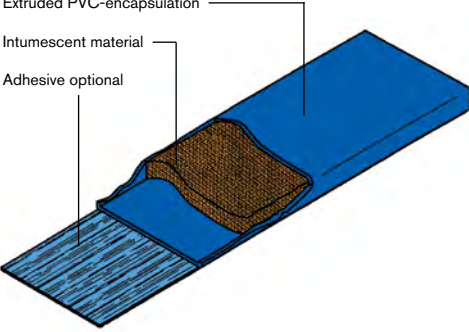
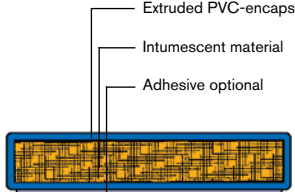
ROKU® Fil PL 1200	ROKU® S 1100	ROKU® Sil	ROKU® Therm	ROKU® Therm Premium	ROKU® V2 Gypsum Board	ROKU® V4 Gypsum Board	ROKU® V6 Gypsum Board
							
P-3906/4429- MPA BS	–	P-BRA- 5135006	P-HFM B 5094	–	–	–	–
B1 as to DIN 4102-1	A1 as to DIN EN 13501-1 (in preparation)	A1 as to DIN 4102-1	B1 as to DIN 4102-1 A2-s1, d0 as to DIN EN 13501-1	–	A2 as to DIN 4102-1	A1 as to EN 15283-1-GM-R	A1 as to EN 15283-2-GF- W1
Solid plate material	Solid plate material	Solid plate material	Solid plate material	Solid plate material	Solid plate material	Solid plate material	Solid plate material
–	–	Smooth front side, back side with glass fibre textile or fleece	Sanded and primed front and back side	Sanded and primed front and back side	Smooth cardboard cover	Smooth fleece surface on both sides	Smooth surface on both sides
960 (±10 %)	1100 (±10 %)	970 to 1170	230 to 530	Approx. 450 (±10 %)	800 to 1000	Approx. 900	1100 to 1500
Max. 3	–	Approx. 25	Max. 1,5	Max. 1,5	Max. 0,3	Max. 1	–
0,120	Approx. 0,150	0,139	0,064	–	0,270	0,250	0,380 to 0,440
–	Approx. 12	Approx. 9,5 to 10	6,8 to 8,5	–	6 to 9	6 to 9	6 to 9
–	Approx. 5,5	–	–	–	Approx. 4,9	Approx. 6	Approx. 4,2

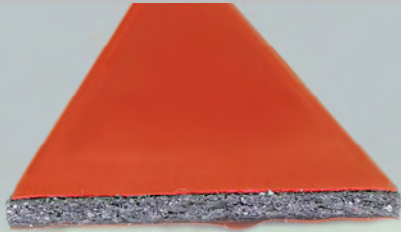
Adhesives

PRODUCT NAME	ROKU® Glue T-NV, T-MV, T-HV	ROKU® PUR Glue 1-K-1013
PRODUCTS		
OFFICIAL VERIFICATION	P-3104/2193- MPA BS	–
BUILDING MATERIAL CLASSIFICATION	A1 as to DIN 4102-1	–
MATERIAL STRUCTURE	Low-viscosity/ medium-viscosity/ high-viscosity glue	Low-viscosity glue
GROSS DENSITY [kg/m³]	1550 to 1630	1120 (±10 %)
START EXPANSION TEMPERATURE [°C]	From approx. 160	–
EXPANSION RATE [x-times]	–	–
EFFECT DIRECTION	–	–
INFLATABLE BODY	–	–
PRESSURE [N/mm²]	–	–
PH VALUE	11,4 to 12	–



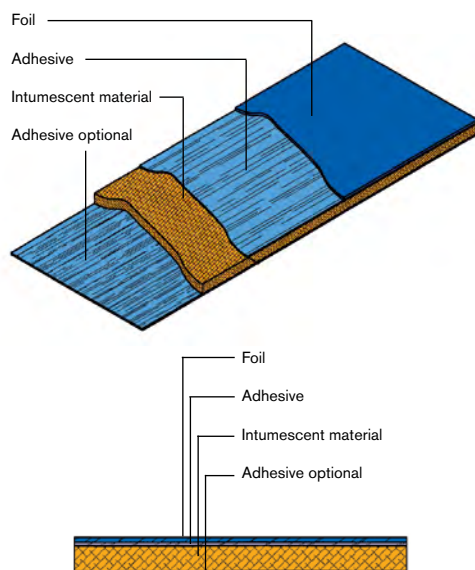
Variants for intumescent materials

		
Variant T ■ Airtight sealed strips in aluminium-foil ■ Standard: PE-foil; coloured PVC-foil ■ Advantage: Foil is very thin	Variant PT ■ Airtight sealed strips intercalary in synthetic profile ■ Advantage: Also available PVC-free	Variant E ■ Completely encapsulated with PVC-foil ■ Advantages: ■ Best protection against mechanical wear and tear ■ Cut edges of Palusol® Strips do not require subsequent sealing ■ Various colours available
 	 	 
Can be used with the following intumescent materials: ■ Palusol® ■ Interdens® Typ 36	Can be used with the following intumescent materials: ■ Palusol® ■ Interdens® Heatseal	Can be used with the following intumescent materials: ■ Palusol® ■ ROKU® Strip ■ Kerafix® Flexpan (assortment) ■ Kerafix® Flexpress (assortment) ■ Interdens® Heatseal



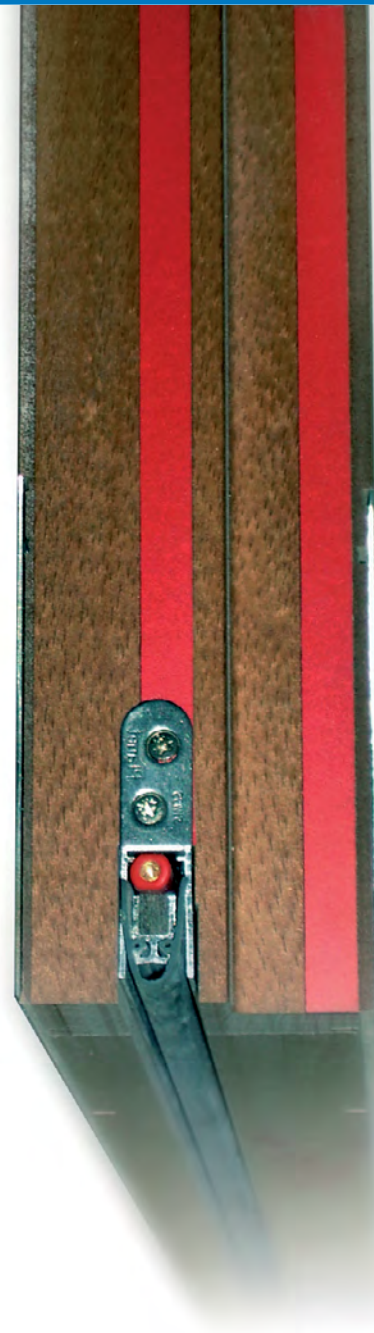
Variant DF

- One-sided laminated with PVC-foil
- Also available with a textile tape (GW) and cellular polyethylene tape (ZPE)
- **Advantage:** Thin, different colours available



Can be used with the following intumescent materials:

- ROKU® Strip
- Kerafix® Flexpan (assortment)
- Kerafix® Flexpress (assortment)
- Kerafix® FXL (assortment)



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