The company SAND Profile

SAND Profile, founded in 1983, has grown from a trading company into a leading manufacturer of rubber and thermo plastic extrusions. Product ideas and innovative solutions generated by our development center can quickly be realized with the help of our in-house die-making facility. From concept to approval stage the new profiles can be manufactured in a wide range of thermoplastic or elastomeric materials. Today we are a global company with headquarters in Stockstadt/Germany and we can look back on a stable growth in the past years.

By our competence and creativity, we are able to offer our customers solutions that can be quickly implemented and can be used permanently.

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Reg-Nr. 66247

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FINISHING

INNOVATIVE. INDIVIDUALISED. PREMIUM

BUTYL

Butyl sealants are ideal too ise for sealing where no mechanical forces need to be transferred. Due to the high adhesiveness of their outer surface, they can also be used as temporary fixes.

ANTI-FRICTION COATING

Covering rubber profiles with anti-friction coating makes the material very resistant to abrasion. As wekk as improving the look of the surface, adding coating using onli processes also helps prevent freezing and reduced friction noise.

STRETCH SEALS

Especially when dealing with soft compounds, stretchable seal threads prevent the material from being pulled too thinly while being applied.

SELF-ADHESIVE TAPE

Profiles with acrylic foam offer high adhesion to a range of different surface. The consistency of the tape itself means that tension at the point of adhesion is removed, allowing for long-term use.

EMI-FOIL

This self-adhesive conductive foil finish our sealant profiles extremely low ohmic resistance.

FLOCK SEALS

Flock-lined seals are generally used for all kinds of window run channels; they are highly robust and very resistant to abrasion.

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INDUSTRIES

TECHNICAL APPLICATIONS FOR OUR SEAL PROFILES

»AUTOMOTIVE

SAND PROFILE has developed its own lightweight, fully recyclable draw-cord system for vehicle seat covers. We also offer retainers, fleece, and plastic profiles at all quality levels. Our state-of-the-art production facilities not only allow us to reach the high-standards set by today`s automotive industry, but also to develope and deliver high-end limited production runs

»MOTOR HOMES

As a producer of sealing systems for doors, flaps, windows, and fasteners, **SAND PROFILE** delivers to the entire European caravan and motor home industry. Besides door seals, we also produce profiles for sun-roofs, utilities flaps, and for the bonnet and boot. In order to prevent freezing and to keep noise to a minimum, more and more of our seals are now being offered with anti-friction coatings using online processes, and can also be provided with flock or textile padding.

»UTILITY VEHICLES

Today`s utility vehicle requires sealing systems which can adapt to the rapid pace of change in this sector and be applied to the full range of models. Whether for driver`s cabin doors, for windshields, or for boot/trailer seals, **SAND PROFILE** has a wide variety of material in stock and can offer individual solutions at the highest level of quality at competitive prices. We are always sure to take full account of the everincreasing standards for closing power, wind noise, and aerodynamics.

»RAIL TRANSPORT

SAND PROFILE offers a comprehensive portfolio of sealant solutions across the rail vehicle industry. Whether for locomotives or for rolling stock, whether for trams or metro units, we have a full range of compliant products (e. g. DIN 5510, N F 16-191 (French fire protection standard), BS6853 (British fire safety) **EN45545**, DBL 5571.12 + DBL 5571.30, Fiat 55297, FMVSS302, EG95/28, ECE118). All of these profiles can ve offered glued, welded or vulcanising, and gluing are at your service.

»VEHICLE CABS

SAND PROFILE develops and produces ready-to-mount seals for cabs in vehicles for the construction and agriculture industries. We offer a full service, frim developing and building prototypes through to series production. Wether small-series or high-volume, we can make your projects reality according to your specifications. We adapt both the raw materials and the final product entirely to yiur needs; all of our solutions are robust and stand up to ozone, weather extremes, and age.

»INDUSTRIAL APPLICATIONS

With its full range of in-stock rubber and plastic seals and its sites in Europe, America, and Asia, **SAND PROFILE** is a go-to company for the power switching and casing industries, for the whole mechanical engineering sector, and well as for the growing solar and wind power-generation segment. We are continuously developing new solutions specifically for these applications, and also offer seals to the ventilation industry (cleanroom technology) in compliance with the **VDI6022** microbial inertness standard.

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A3592	47	B1 108	52	D1 012	56
A3605	47	B1 110	52	D1 013	55
A3634	19	B1 112	52	D1 014	57
A3655	48	B1 113	52	D1 015	57
A3725	45	B1 114	52	D1 020	56
A3725-BU	45	B1 115	52	D1 021	56
A3729	45	B1 117	54	D1 022	57
A3752	42	B1 118	52	D1 024	57
A3757	43	B1 119	52	D1 025	57
A3767	41	B1 120	52	D1 026	57

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Thermoplastic Elastomers

Elastic like rubber, yet not rubber!

Elastic, supple and flexible -these are the properties typical for rubber, a material known by everybody and part of everyday life in many forms.

Rubber is made from caoutchouc, a natural or synthetic product. Caoutchouc is a viscous plastic material, which is transformed into elastic rubber only by adding polymerizing substances such as sulphur or peroxide and subsequent heating. During this „vulcanization“ the thread-like caoutchouc molecules polymerize due to the build-up of chemical bonds between each other. This polymerization is the reason for the product‘s elasticity. The vulcanization can only be reversed by thermal destruction.

The **Thermoplastic Elastomers (TPEs)** show a completely different behaviour. As their name conveys, these materials turn plastic during heating (Greek: thermos = heat), when cooling, however, they revert to elastic behaviour again. In contrast to the **chemical polymerization** of rubber, in this case a **physical polymerization** occurs.

Considering their structure and behaviour, TPEs range between thermoplastics and elastomers. They can be processed as easily as thermoplastics and have the most important properties of rubber. Above all, TPEs are not a risk to the environment. In contrast to rubber, they can simply be recycled and re-processed.

In the mean time, there exists a plurality of TPE qualities for the most various applications such as the food handling industry which must comply with FDA quality standards.

PVC

PVC (polyvinyl-chloride) is the most important among all polymers. Its part in the German chlorine production amounts to about one quarter. It has been produced for more than 55 years.

The advantages of PVC are its stability as a material and its extremely good resistance against weather. It does not corrode, is hardly flammable and does not de-polymerize. Yet, the formation of dioxines during combustion is an extreme disadvantage.

Nowadays, PVC is mostly used in construction, medicine (in instruments, not drugs) and packaging. There is a difference made between hard PVC, used in pipes, profiles for windows and borders (ratio of PVC: 77-89%) and soft PVC, which is used in insulation, tubes, floors and edge protection profiles (ratio of PVC: 44-61%).

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Sponge Rubber Varieties

Natural Rubber (NR)

Harvested as latex from the Hevea brasiliensis, polymerized with sulfur.
Temperature range: -40 to +70°C.
Advantages: Good elasticity and mechanical properties (tear and abrasion resistance, notch toughness, elasticity), no remaining deformation after strain, and high resistance to alternating bending.
Disadvantages: Medium to low resistance to oil, weather, and ozone, as well as thermal resistance; flammable.

Ethylene-Propylene-Diene Monomer (EPDM)

Synthetic caoutchouc, terpolymers (EPDM polymerized with sulfur).
Temperature range: -50 to +120°C dry conditions; with water and steam up to 130°C.
Advantages: Excellent weather resistance, as well as to aging, ozone, chemicals, hot water and steam; good resistance to polar fluids such as acetone, methanol etc., outstanding electrical insulation properties, low steam permeability, good thermal resistance, extremely low brittleness temperature.
Disadvantages: Low resistance to aliphatic and aromatic hydrocarbons (mineral oil, petrol, fuels); flammable.

Polychloroprene (CR)

Synthetic caoutchouc mostly polymerized with metal oxides, not sulfur.
Temperature range: -30 to +90°C, hot water not recommended.
Advantages: Good thermal resistance as well as to aging, weather, ozone, low flammability, high resistance to alternating bending, medium resistance against oil (higher than NR, lower than nitrile rubber; good mechanical properties and elasticity, but not as good as for NR; small deformation remaining.
Disadvantages: According to type of CR-Type, possibility of crystallization due to lasting cold.

Nitrile rubber (NBR)

Synthetic caoutchouc, Polyacryl-Nitrile-Butadiene rubber polymerized with sulfur.
Temperature range: -20 to +100°C with dry conditions, hardens with hot air, with oils up to +120°C, with water up to +80°C.
Advantages: High oil, petrol and thermal resistance, good mechanical toughness, low remaining deformation under pressure.
Disadvantages: Very low weather and ozone resistance, low elasticity, flammable

Colours

All cell rubber round and square cords are available in black and light grey.

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Special EPDM compounds, and fire safety standards that are currently applied.

FMVSS 302, EG 95/28, ECE-R 118 (general fire safety standard)

Compact rubber:	50° Shore 60° Shore 70° Shore
Sponge rubber:	Density 0.4, 0.5, 0.6 & 0.8

DIN 5510-2 (german fire safety standard)

Compact rubber:	60° Shore 70° Shore
Sponge rubber:	Density 0.6

NFF 16-101 (french fire safety standard)

Compact rubber:	70° Shore
Sponge rubber:	Density 0.6

BS 6853 (british fire safety standard)

Compact rubber:	60° Shore

Uni CEI 11170-3 (italian fire safety standard)

Compact rubber:	60° Shore
Sponge rubber:	Density 0.6

EN 45545 (european fire safety standard)

Compact rubber, Kl. R22/R23 HL3	60° Shore
Sponge rubber, Kl. R22/R23 HL2	Density 0.8

Compounds according to VDI 6022 - microbial inertness

Compact rubber:	50° Shore 60° Shore
Sponge rubber:	Density 0.6

In addition, we have numerous compounds released by various DBL standards, Fiat standards, BMW standards, MAN standards and UL standards. Further information can be obtained on request

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Factory Tolerances

The purpose of the subsequently compiled tolerances from the respective standard is to facilitate the quick assignment of tolerated dimensional deviations

Not applicable to drawing with fixed tolerances.

Moulded rubber parts based on DIN 7715 M4

Nominal range in mm				+ / - mm
		to	6,3	0,5
>	6,3	to	10,0	0,7
>	10,0	to	16,0	0,8
>	16,0	to	25,0	1,0
>	25,0	to	40,0	1,3
>	40,0	to	63,0	1,6
>	63,0	to	100,0	2,0
>	100,0	to	160,0	2,5
>	160,0			1,5 %

Solid rubber profiles (cross section) based on DIN ISO 3302-1E2

Nominal range in mm				+ / - mm
		up to	1,5	0,25
>	1,5	to	2,5	0,35
>	2,5	to	4,0	0,40
>	4,0	to	6,3	0,50
>	6,3	to	10,0	0,70
>	10,0	to	16,0	0,80
>	16,0	to	25,0	1,00
>	25,0	to	40,0	1,30
>	40,0	to	63,0	1,60
>	63,0	to	100,0	2,00

Sponge rubber (cross section) based on DIN ISO 3302-1 E3

Nominal range in mm				+ / - mm
		up to	1,5	0,40
>	1,5	to	2,5	0,50
>	2,5	to	4,0	0,70
>	4,0	to	6,3	0,80
>	6,3	to	10,0	1,00
>	10,0	to	16,0	1,30
>	16,0	to	25,0	1,60
>	25,0	to	40,0	2,00
>	40,0	to	63,0	2,50
>	63,0	to	100,0	3,20

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Factory Tolerances

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Not applicable to drawing with fixed tolerances.

Tolerances for custom length (rubber) based on DIN ISO 3302-1 L3

Nominal range in mm				+ / - mm
		up to	40	1,6
>	40	to	63	2,0
>	63	to	100	2,5
>	100	to	160	3,2
>	160	to	250	4,0
>	250	to	400	5,0
>	400	to	630	6,3
>	630	to	1000	10,0
>	1000	to	1600	12,5
>	1600	to	2500	16,0
>	2500	to	4000	20,0
>	4000			0,50%

PVC-Profiles (cross sections) based on DIN 16941 3A und 3B

Nominal range in mm				+ / - mm
		up to	3	0,4
>	3	to	6	0,6
>	6	to	10	0,7
>	10	to	18	0,8
>	18	to	30	1,0
>	30	to	50	1,2
>	50	to	80	1,5
>	80	to	120	1,9
>	120	to	180	2,3
>	180	to	250	2,8
>	250	to	320	3,5
>	320			1,4%

Tolerances for custom length (PVC) based on DIN 16941 4B

Nominal range in mm				+ / - mm
		up to	400	5,0
>	400	to	1000	10,0
>	1000	to	2500	20,0
>	2500	to	6000	30,0
>	6000	to		2 %

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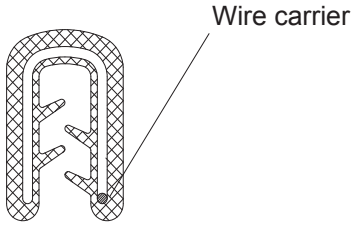
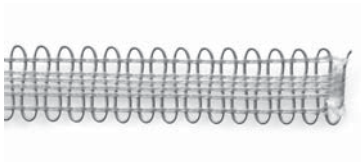
Steel- or wire carrier?

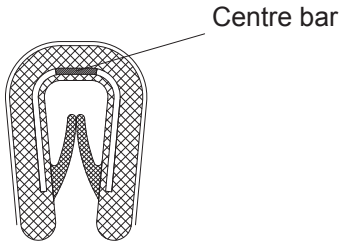
By using either steel or wire carrier, the edge protection sections will cling well, without the use of splicing tape. However, the use of a steel carrier will have a higher clamping effect than a wire carrier.

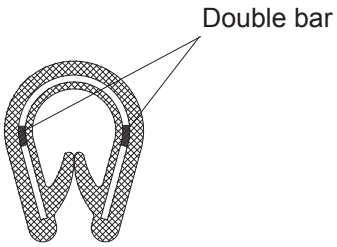
The disadvantage of a profile with an unbroken steel carrier is a restricted bending radius over the lateral blade. This can be solved by breaking the connecting bridges. However, a slightly uneven strand may develop if this is done. In most technical applications the appearance will be irrelevant.

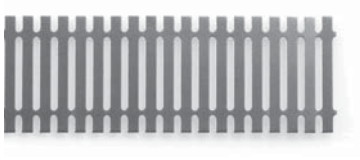
The choice of either a steel or wire carrier largely depends on the application situation, and the desired appearance.











This steel carriers can also be offered in stainless steel

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Application for the edge protectors

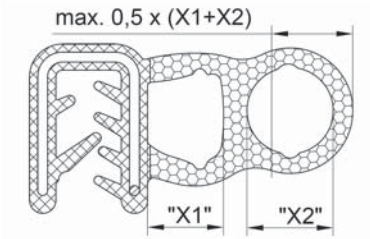
Edge protection profiles simplify the finishing of edges. They eliminate preparatory and follow-up work, neutralize respectively cover sheet metal edges. Furthermore, their decorative effect is often desired.
The edge protectors consist of a U-shaped metal base, either a steel strip or wire carrier, jacketed with PVC or rubber. Those guarantee a tight grip on the edge, even if radii or bends have to be covered. In some profiles, the clamping effect is heightened by PVC lips incorporated into the PVC jacket.

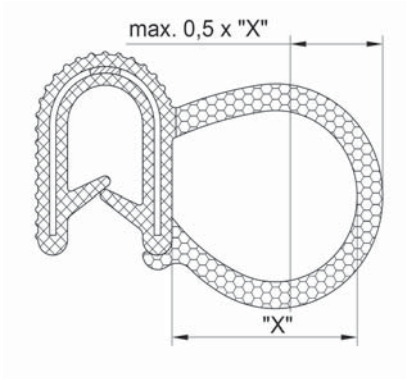
The edge protectors are pressed onto the edge by hand or with a rubber or thermoplastic hammer. Glues or special attachment aids are not required, installation is simple and quick.

Manufacturing tolerances
PVC according to DIN 16941
Tolerances of custom length based upon DIN 16941 4B

Compression recommended for sealing edge protection profiles

The compression of our sealing edge protection profile should have a maximum of 50% as otherwise the compactness, and the restoring force are affected. In practice, the profile should be compressed 30-40%.





Formability of cell rubber profiles

Essential for the application of sealings and underlay plates is the enduring deformation. The most common characteristic is the compression set (DVR).
To determine this dimension, a cylindrical test body is compressed 25% and then stored for a selected time at a selected temperature. Thirty minutes after release, the height is measured at room temperature again, and from the result, the enduring deformation is identified.
A DVR of 0 means that the test body has reached its original height again (not possible in reality), a DVR of 100% shows that the test body has no reset device; after the test the test body would stay completely deformed. Why is the DVR an important parameter?
A flange gasket is compressed to a specified thickness and exerts a pressure on the surface of the flange. After a while this pressure reduces because the rubber deforms plastically. If this plastically characteristic – the DVR – is too high, the press capacity and the sealing effect decrease and the seal is leaks

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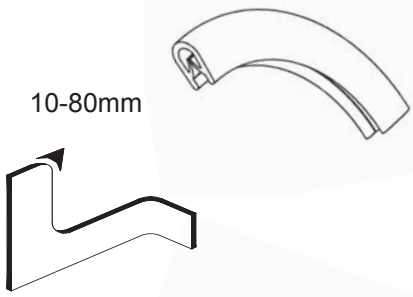
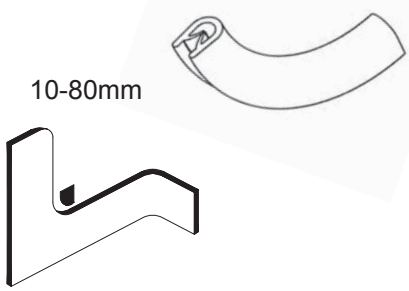
Minimum bending radii

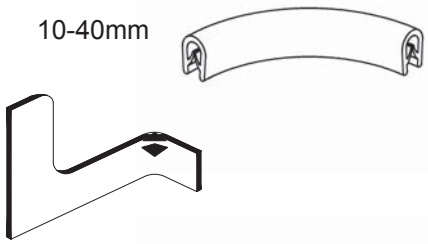
Please note that the minimum bending radii indicated are to be considered as guidelines which, depending on the material, clamping range and application of the profile used, may vary.

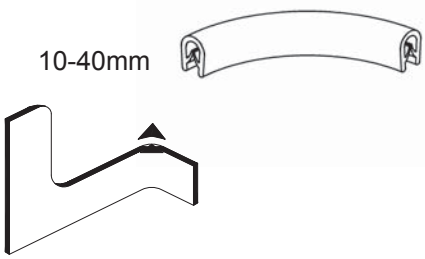
Edge protection



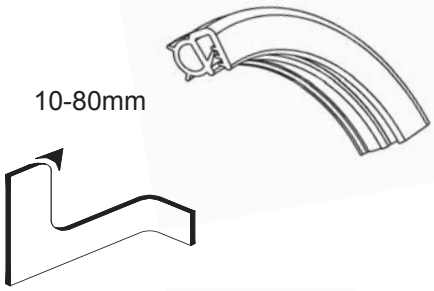


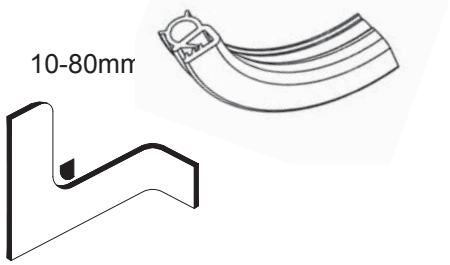
here shown with profile A1 015



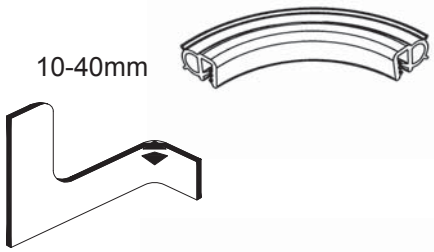


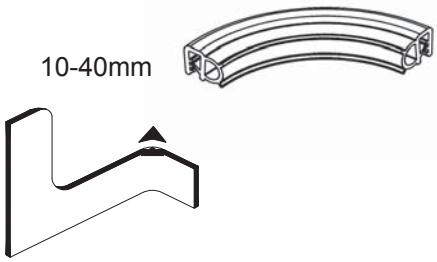
Edge protection with sealing





here shown with profile A1 549





Glazing profiles

For these profiles, the bending radius will comply with the radius of the pane.

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Special products

From a technical and personnel point of view, we are able to offer our customers solutions to suit their applications. Our team of sales representatives is in close contact with our designers, and their consulting function is highly regarded. Our toolmaking facility manufactures up to three new dies a week.

From all products listed on the following pages, we customize in-house:

- vulcanized frames and rings (according to injection moulding and foil-vulcanisation)
- welded or bonded frames and rings
- custom lengths, angle and mitre cuts
- self-adhesive profiles, for easier positioning or equipped with Acrylic Foam* for lasting adhesion

Furthermore, the following special products can be made to order:

- profiles with injected butyl* to improve the sealing ability (for motorhomes and caravans, for example)
- profiles coated with non-woven fabric* or flock* to improve the sliding ability and the appearance (e.g. for window panes and sliding windows)
- profiles with spray coating* to improve the sliding ability (e.g. for sliding windows)
- all sponge rubber profiles can be manufactured in different types of material. The various material properties are listed in a table on page 80.
- EMI-Profiles, i.e. electro-magnetic interference profiles which are coated with a special EMI film*. These profiles are mainly used in the construction of switch boards and bulk electrical equipment.

* You are welcome to ask for the respective data sheets for the materials used.

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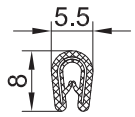
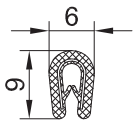
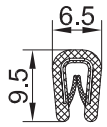
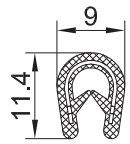
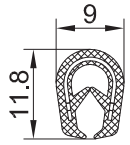
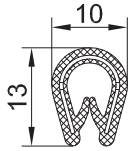
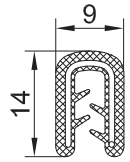
PVC with steel carrier broken / wire carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 009	black	0,8-1,5	100	100
	A1 010 A1 011* A1 012	black white grey	1,0-2,0 1,0-2,0 1,0-2,0	100 100 100	100 1500 100
	A1 013 A1 014 A1 034	black white silver	1,0-2,0 1,0-2,0 1,0-2,0	100 100 100	100 100 100
 Drawing matches to A1 023/4	A1 023/2 A1 023/4	black black	1,0-2,5 2,0-4,0	100 100	100 100
	A2 051	black	1,0–3,0	100	100
	A3007	black	1,0-4,0	100	100
	A1 032*	black	1,0-2,5	4x50	4000

*Upon request - delivery time minimum 5-6 weeks, other profiles on stock, subject to being unsold.
Other colours and materials upon request - Design modifications reserved

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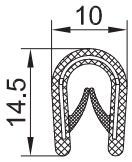
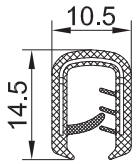
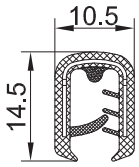
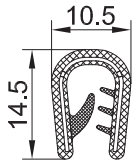
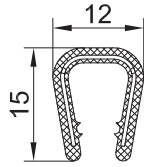
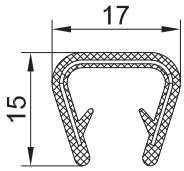
PVC with steel carrier broken

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 015 A1 016 A1 017 A1 022	black anthrazit light grey white grey	1,0-4,0 1,0-4,0 1,0-4,0 1,0-4,0	100 100 100 100	100 100 100 100
	A1 044	black	2,0-5,0	100	100
	A3634	grey	2,0-5,0	10x120	100
	A1 021	black	2,0-5,0	50,1	100
 Drawing matches to A1 019/8	A1 019/8 A1 020/8 A1 019/10 A1 020/10*	black light grey black light grey	6,0-8,0 6,0-8,0 8,0-10,0 8,0-10,0	100 100 100 100	100 100 100 1500
	A2 078	black	10,0-12,0	100	100

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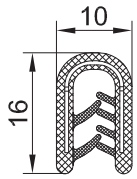
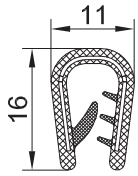
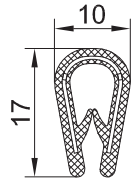
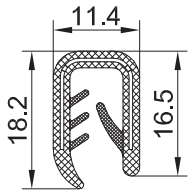
PVC with steel carrier broken / wire carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 037*	black	1,0-4,0	100	6000
 Drawing matches to A1 024/6	A1 024/2* A1 024/4 A1 024/6	black black black	1,0-2,5 2,0-4,0 4,0-6,0	100 100 100	6000 100 100
	A1 018	black	1,0-4,0	100	100
	A1 030*	black	4,0-6,0	100	6000

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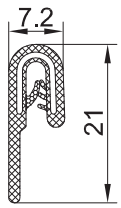
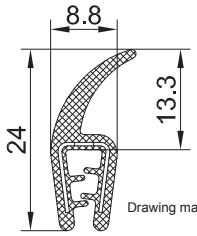
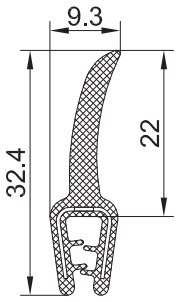
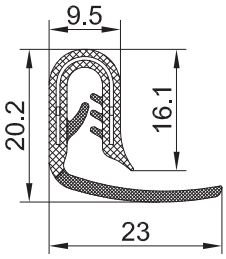
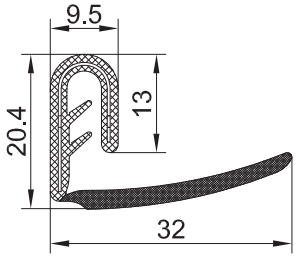
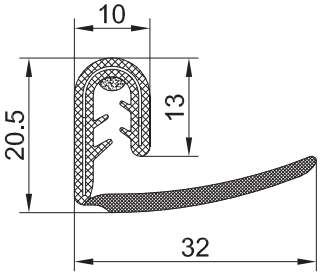
PVC with steel carrier unbroken

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A3046*	black	0,8-1,0	200	8000
	A1 077 A2 813	black black	0,5-3,0 0,5-3,0	100 50	100 50
	A1 075*	black	1,0–2,5	100	2000
	A3087*	white	2,0	10x120	2400
	A3490*	creamy-white	2,0	50,1	1503
	A3362-BU* with Butyl	light-ivory	2,0	50,1	2404,8

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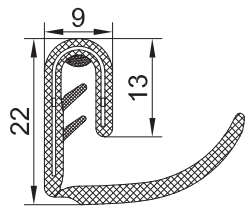
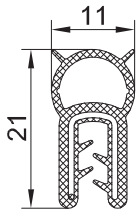
PVC with wire carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A4253-BU steel carrier unbroken with Butyl	white	2,0	1x50,1	50,1
	A2 257* (TPE) stainless steal wire carrier	pearl- white	1,0-2,5	2x50	6000

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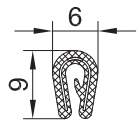
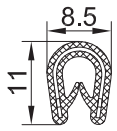
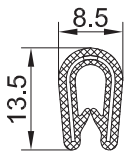
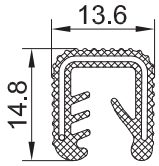
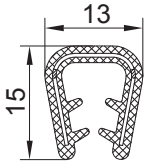
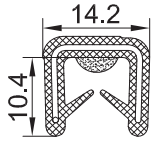
EPDM with steel carrier / wire carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A3521* steel carrier center bar	black	1,0-2,0	100	4000
	A4782 steel carrier center bar (fire safety standard NFF16-101)	schwarz	1,0-2,0	100	100
	A2 613* steel carrier unbroken	black	1,0–3,0	2x100	4000
	A3444* wire carrier	black	5,0-6,0	100	4000
	A3550* steel carrier broken	black	5,0–8,0	100	4000
	A4808-BU with Butyl	black	4,0-6,0	100	3000

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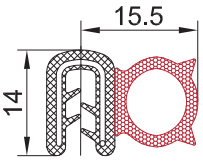
Sponge rubber sealings

All sponge rubber sealings shown on pages 25 and 26 can be combined with any of the PVC edge protectors on **pages 18 - 23** to make an edge protection sealing.
The articles you require are customized by us and can be delivered very shortly, if the standard profiles are in stock.

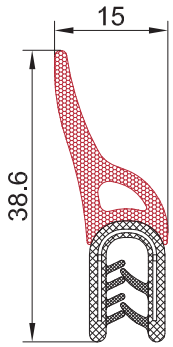
All sponge rubber profiles are black, but can also be manufactured in light and dark grey, upon request.

Representation in following examples:

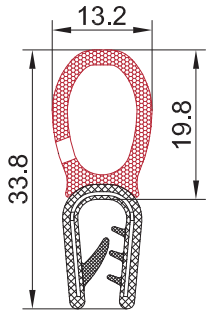
Article A1 032 from page 19 is combined to the sealing profile E2 575 from page 25 =article number A2 196 on page 31.



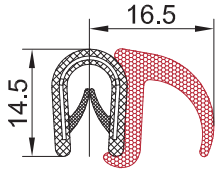
Article A1 037 from page 20 is combined to the sealing profile E2 580 from side 25 =article number A2 127 on page 30.



Article A1 024/2 from page 18 is combined to the sealing profile E2 583 from page 26 =article number A1 104/2 on page 30.



Article A1 015 from page 19 is combined to the sealing profile E2 553 from side 26 =article number A1 132 on page 33



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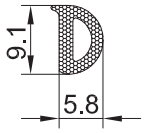
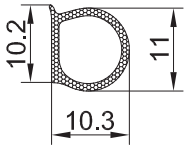
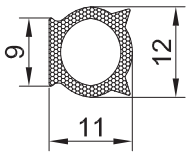
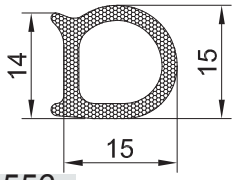
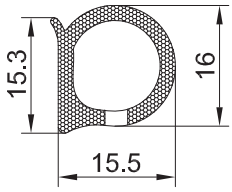
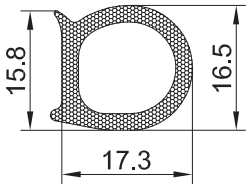
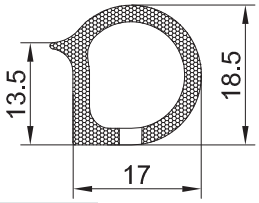
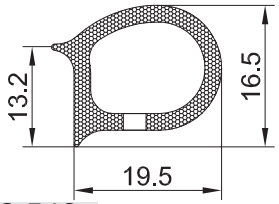
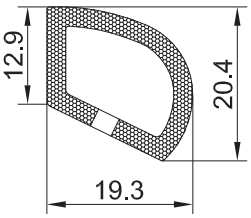
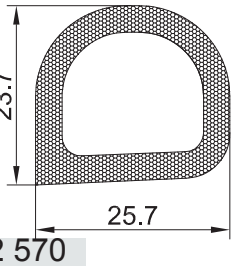
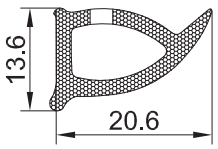
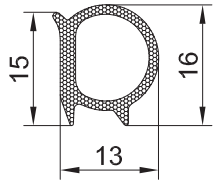
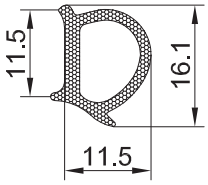
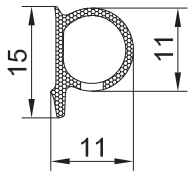
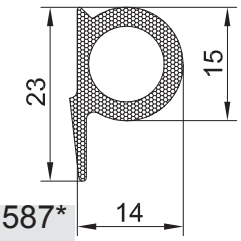
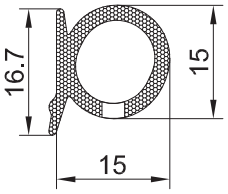
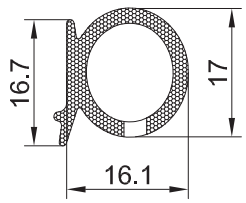
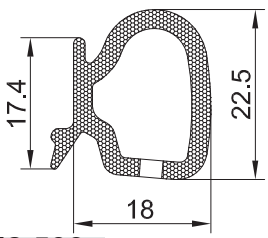
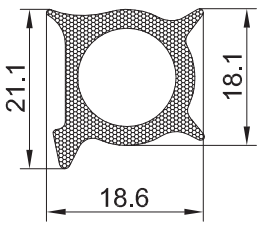
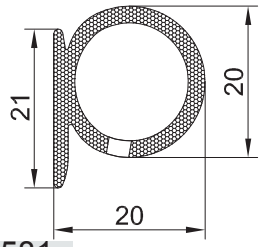
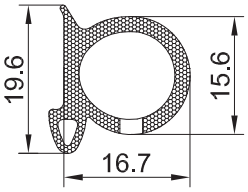
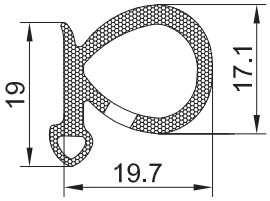
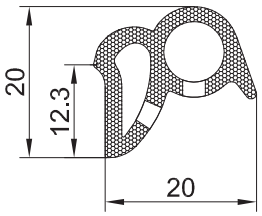
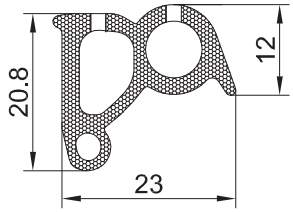
Sponge Rubber EPDM - black

(for combination with the edge protectors from pages 18 - 23 **please confirm the joining surfaces are compatible**)

Design			
 E2 558	 E2 566	 E2 575	 E2 556
 E2 605	 E2 541	 E2 594*	 E2 548
 E2 726*	 E2 570	 E2 546	 E2 701
 E2 632*	 E2 563	 E2 587*	 E2 562
 E2 611*	 E2 593	 E2 577	 E2 581
 E2 573	 E2 576	 E2 547*	 E2 683

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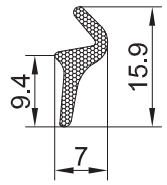
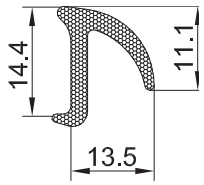
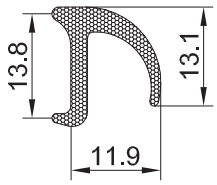
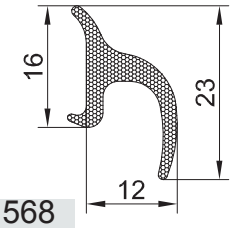
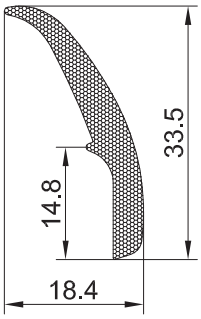
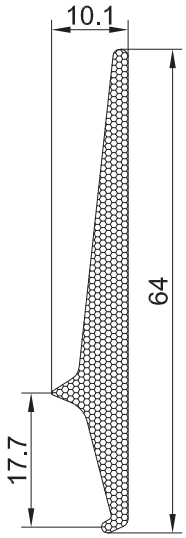
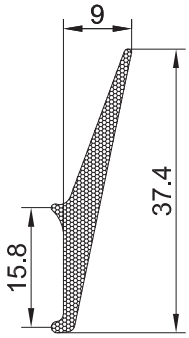
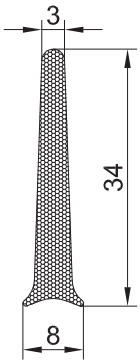
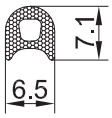
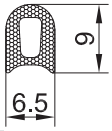
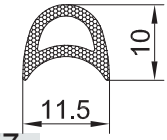
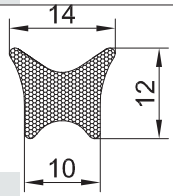
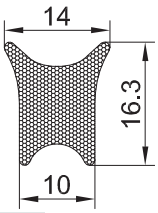
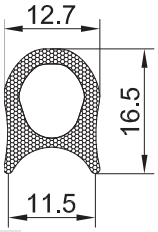
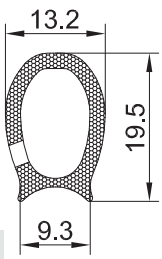
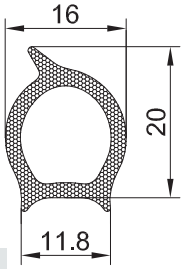
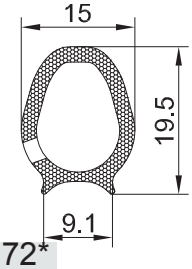
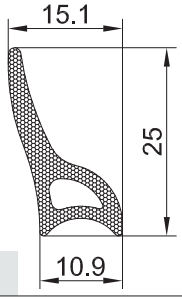
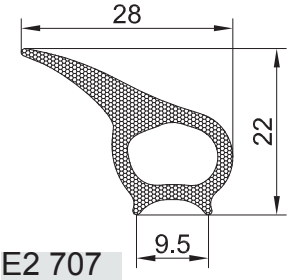
Sponge Rubber EPDM - black

(for combination with the edge protectors from pages 18 - 23 **please confirm the joining surfaces are compatible**)

Design			
 E2 595*	 E2 555	 E2 553	 E2 568
 E2 559*	 E2 647	 E2 657*	 E2 584*
 E2 582	 E2 598*	 E2 557	 E2 572
 E2 640	 E2 554	 E2 583	 E2 659*
 E2 672*	 E2 580	 E2 707	

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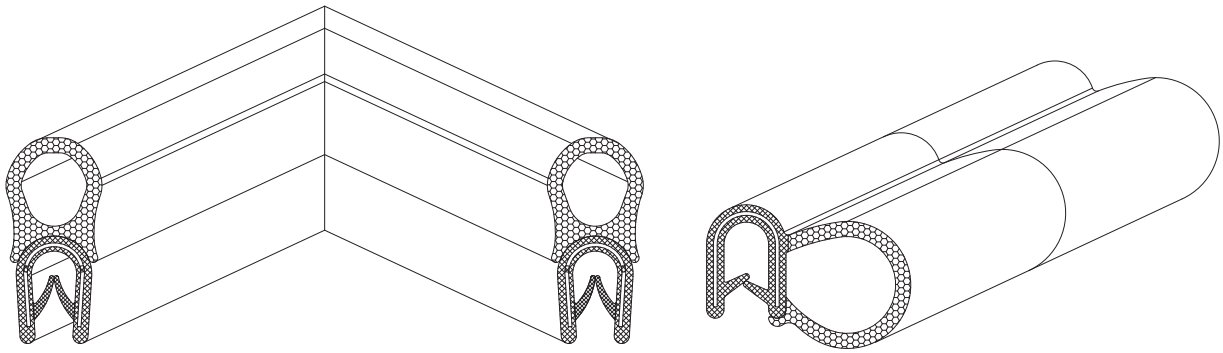
Sealing profiles

Sealing profiles are a combination of PVC edge protectors with bonded sponge rubber profiles or a co-extrusion of solid and sponge rubber. These profiles have a dual function; they cover sharp or unfinished edges and also offer a sealing function.

The sponge rubber tubes are extremely flexible and are suitable for sealing doors, hatches, and numerous other applications. The assembly is similar to edge protectors.

Manufacturing tolerances

Soft rubber	DIN ISO 3302-1 E2
Sponge rubber	DIN ISO 3302-1 E3
Soft PVC	DIN 16941 3B
Custom lengths	DIN ISO 3302-1 L3 / 16941 4B



Sealing profiles as a combination between PVC edge trim and cell rubber can have upto two glued joints.

All profiles shown on the following pages are available in custom lengths, frames or rings.

Other colours and qualities such as food compatible, flame resistant or self-extinguishing qualities are available upon request.

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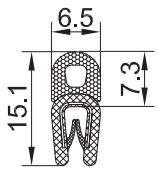
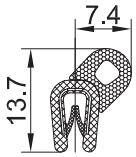
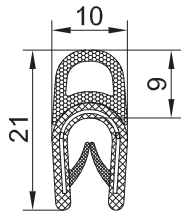
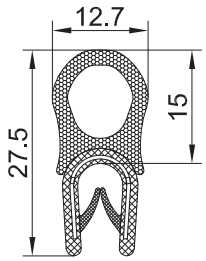
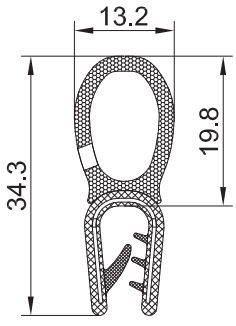
PVC with steel carrier broken bonded to EPDM sponge rubber

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 107	black	1,0-2,0	100	100
	A2 158*	black	1,0-2,0	200	2000
	A1 102	black	1,0-4,0	50	50
	A1 117	black	1,0-4,0	50	50
 Drawing matches to A1 104/4	A1 104/2 A1 104/4 A1 104/6	black black black	1,0-2,5 2,0-4,0 4,0-6,0	50 50 50	50 50 50

*Upon request - delivery time minimum 5-6 weeks, other profiles on stock, subject to being unsold.
Other colours and materials upon request - Design modifications reserved

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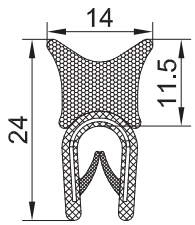
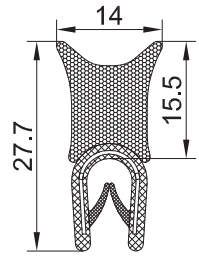
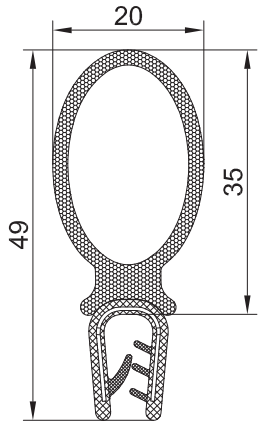
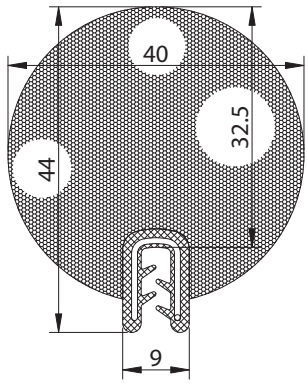
PVC with steel carrier / wire carrier bonded to EPDM sponge rubber

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 110	black	1,0-4,0	50	50
	A1 119	black	1,0-4,0	50	50
	A2 125 with EPDM soft rubber tube 50 ± 5 Shore A steel carrier broken	black	2,0–4,0	25	25
	A2 213 with PU-foam and wire carrier	black	1,0–2,5	available in max. lenght of 2m	250 125 pcs. equal 250 mtr.

*Upon request - delivery time minimum 5-6 weeks, other profiles on stock, subject to being unsold.
Other colours and materials upon request - Design modifications reserved

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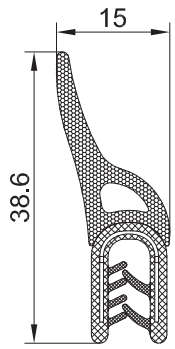
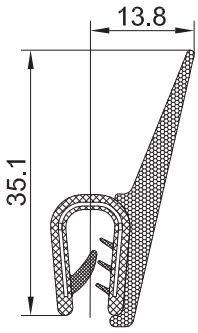
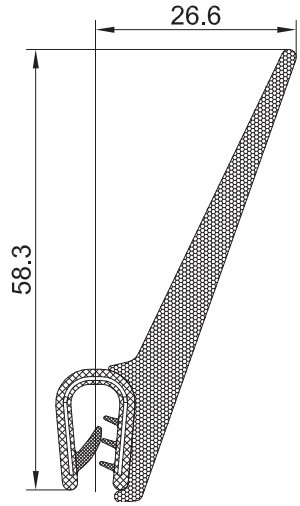
PVC with steel carrier broken bonded to EPDM sponge rubber

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A2 127	black	1,5-3,5	50	50
	A3073*	black	2,5–4,0	25	4000
	A1 105/2 A1 105/4 A1 105/6	black black black	1,0–2,5 2,0-4,0 4,0-6,0	25 25 25	25 25 25

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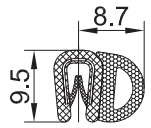
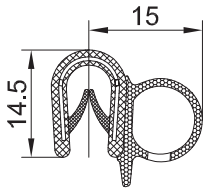
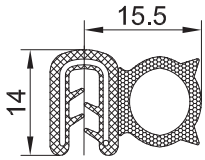
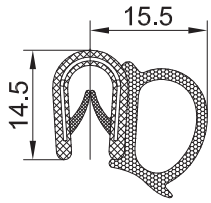
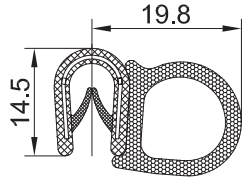
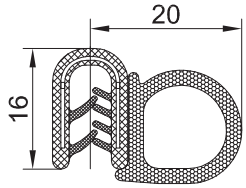
PVC with embedded steel carrier / wire carrier bonded to EPDM sponge rubber

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 101	black	1,0–2,0	100	100
	A1 114	black	1,0-4,0	50	50
	A2 196* wire carrier	black	1,0-2,5	100	5000
	A1 109	black	1,0–4,0	50	50
	A1 100	black	1,0–4,0	50	50
	A2 255	black	1,0-4,0	50	50

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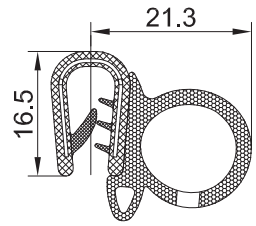
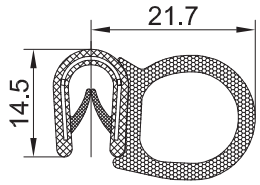
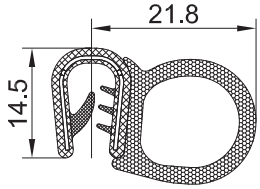
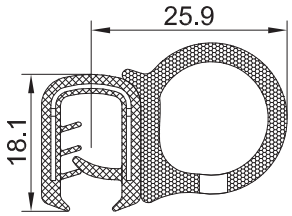
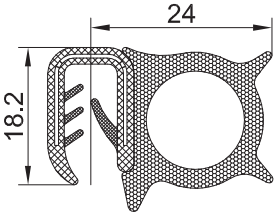
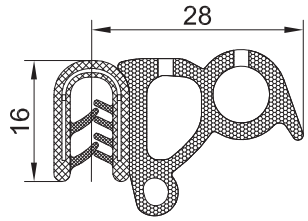
PVC with steel carrier broken bonded to EPDM sponge rubber

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
 Drawing matches to A1 121/4	A1 121/2* A1 121/4 A1 121/6*	black black black	1,0-2,5 2,5-4,0 4,0-6,0	50 50 50	1000 50 1000
	A1 108	black	1,0-4,0	50	50
	A2 254	black	2,0-5,0	50	50
	A2 139	black	3,0	50	2000
 Drawing matches to A1 134/4	A1 134/2* A1 134/4 A1 134/6	black black black	1,0-2,5 2,5-4,0 4,0-6,0	50 50 50	1000 50 50
 Drawing matches to A2 106/4	A2 106/2 A2 106/4 A2 106/6	black black black	1,0-2,5 2,5-4,0 4,0-6,0	50 50 50	50 50 1000

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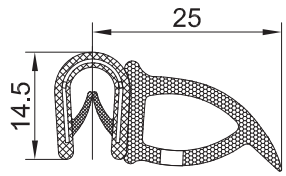
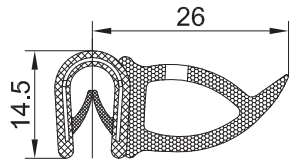
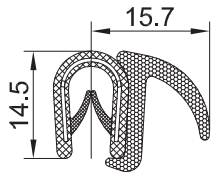
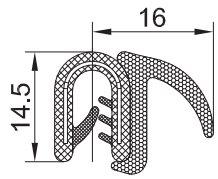
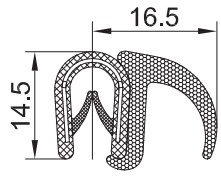
PVC with steel carrier broken bonded to EPDM sponge rubber

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 162*	black	1,0–4,0	50	2000
	A2 124*	black	1,0–4,0	50	2000
	A1 103	black	1,0–4,0	50	50
	A2 256	black	1,0-3,5	50	50
	A1 132	black	1,0–4,0	50	50

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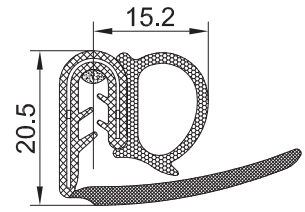
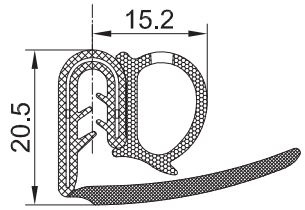
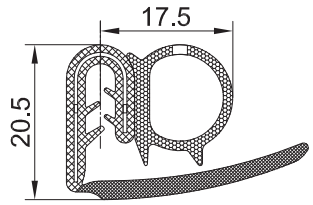
PVC with embedded steel carrier broken bonded to EPDM sponge rubber

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A3339* with Butyl steel carrier unbroken	carrier: grey white (available in other colours) tube: black	1,5-2,0	50	1000
	A3363* steel carrier unbroken A3363-BU* with Butyl	carrier: grey white (available in other colours) tube: black	2,0	50	3000
	A3530* steel carrier unbroken	carrier: creamy white (available in other colours) tube: black	1,5	50	6000

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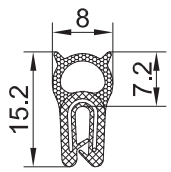
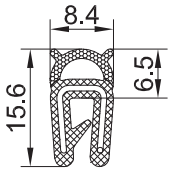
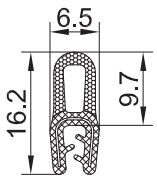
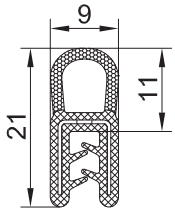
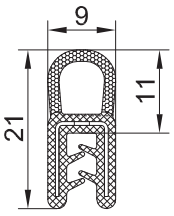
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A2 544 wire carrier	black	0,5-1,5	2x50	100
	A2 518 wire carrier	black	1,0-2,0	2x50	100
	A3432* steel carrier centre bar	black	1,0-2,0	3x100	6000
	A1 512 steel carrier centre bar	black	1,0-2,5	100	100
	A3196* with sliding varnish coating steel carrier centre bar	black	1,0-2,5	100	4000

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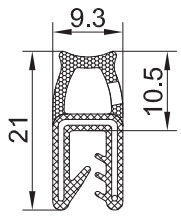
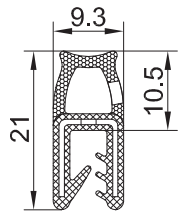
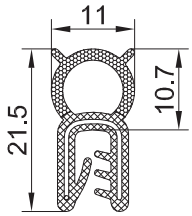
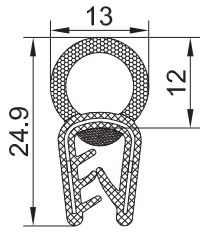
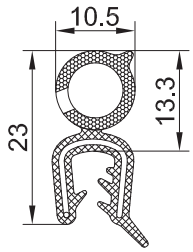
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 513 wire carrier	black	1,0–3,0	2x50	100
	A1 517 steel carrier centre bar	black	1,0–3,0	2x50	100
	A2 513 EPDM wire carrier A2 513 NBR oil resistant wire carrier	black black	1,0–3,0 1,0–3,0	2x50 2x50	100 100
	A4466-BU* steel carrier broken with Butyl	black	2,0-4,0	75	3000
	A3280* wire carrier	black	2,5-3,5	50	4000

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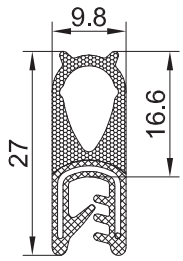
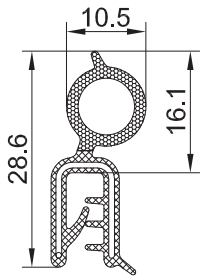
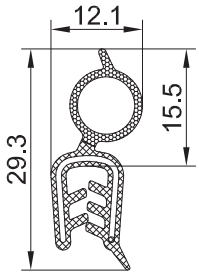
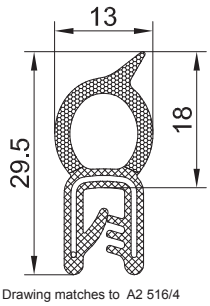
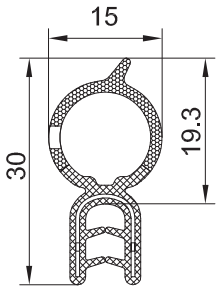
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 538 wire carrier	black	1,0-3,5	2x50	100
	A2 514* wire carrier	black	1,0-2,5	50	4000
	A2 546 wire carrier	black	1,5-3,5	2x50	100
 Drawing matches to A2 516/4	A2 516/2 A2 516/4 wire carrier	black black	1,0-2,5 2,0-4,0	2x50 2x50	100 100
	A3806* steel carrier broken	black	2,0-3,0	2x25	4000

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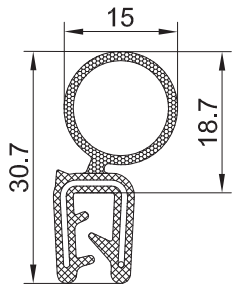
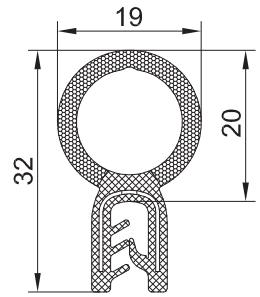
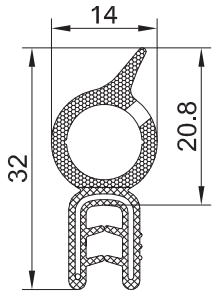
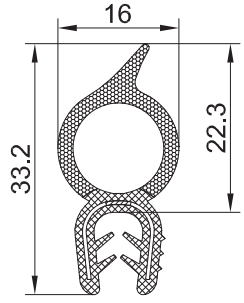
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Co-extrusion profiles

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 525 wire carrier	black	1,0-3,0	50	50
	A3289* steel carrier unbroken	black	1,0-2,0	50	3000
	A3321 wire carrier	black	1,0-3,0	51	51
 Drawing matches to A4421	A4421 steel carrier unbroken A4422* steel carrier broken	black black	1,5-3,0 3,0-5,0	3x25 3x25	4500 4500

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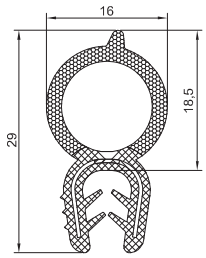
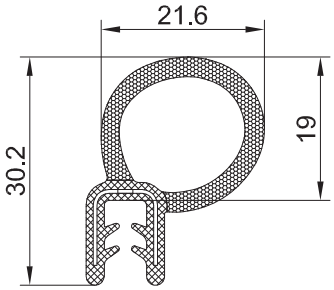
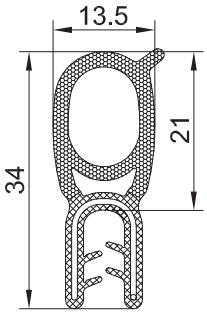
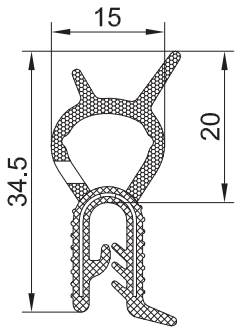
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A4423* steel carrier unbroken	black	1,0-2,5	3x25	4500
	A4807* steel carrier unbroken	black	3,0-4,0	50	3000
	A3500* wire carrier	black	1,5-3,5	75	3000
	A3807* steel carrier unbroken	black	2,0-3,0	2x25	3600

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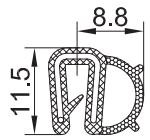
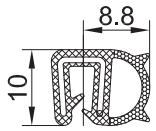
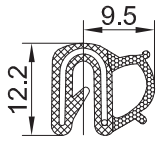
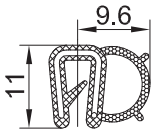
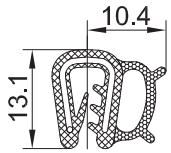
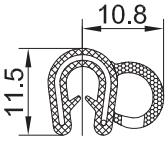
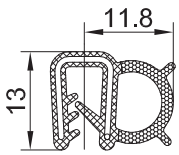
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Co-extrusion profile

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A3860* with sliding varnish coating	black	2,0-3,0	2x25	3000
	A2 533 wire carrier	black	1,0-2,5	100	100
	A2 507 wire carrier	black	0,8-2,5	2x50	100
	A2 545 wire carrier	black	1,0-2,0	2x50	100
	A2 506S wire carrier	black	2,0	2x50	100
	A3471* wire carrier	black	1,0-2,0	4x50	4000
 Drawing matches to A1 549	A1 549 EPDM wire carrier A1 550 NBR wire carrier	black black	2,0 2,0	2x50 2x50	100 100

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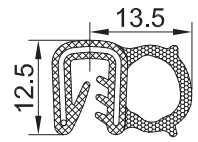
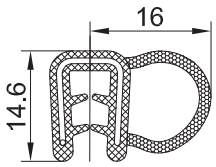
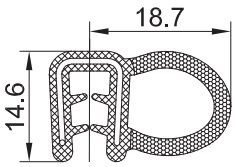
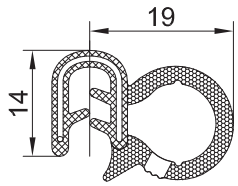
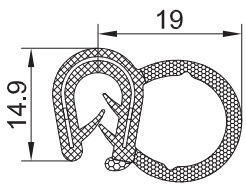
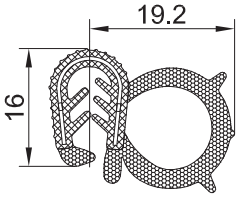
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A3379 wire carrier	black	2,0-3,0	2x50	4000
	A1 536 wire carrier	black	1,5-3,0	2x50	100
	A2 539 wire carrier	black	1,5-3,0	4x25	100
	A3767* wire carrier	black	2,0-4,0	50	4000
	A3911 steel carrier unbroken	black	1,5	50	4000
 Drawing matches to A2 540	A2 540 steel carrier unbroken A2 541 steel carrier unbroken	black black	2,0–4,0 4,0-6,0	3x25 3x25	75 75

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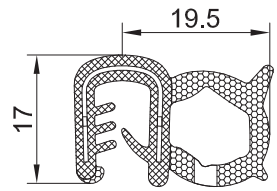
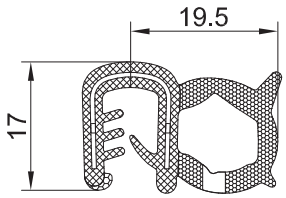
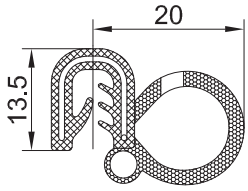
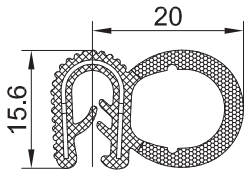
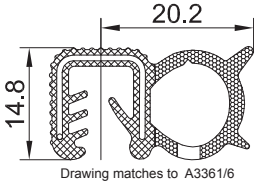
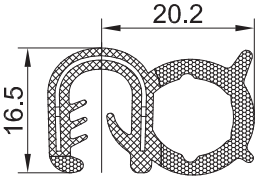
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Co-extrusion profiles

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A4713* steel carrier unbroken	black	5,0-6,0	50	3000
	A4803* steel carrier unbroken	black	5,0-6,0	50	3000
	A3297 steel carrier unbroken	black	2,0	50	50
	A3229 steel carrier unbroken	black	1,0-4,0	50	50
 Drawing matches to A3361/6	A3361/4* A3361/6* wire carrier	black black	2,0-4,0 5,0-6,0	75 75	4500 4500
	A3752* steel carrier unbroken	black	5,0-6,0	50	5000

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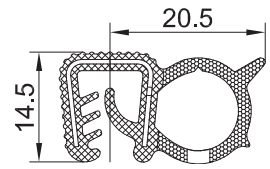
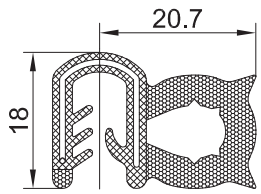
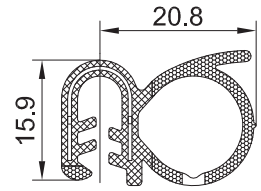
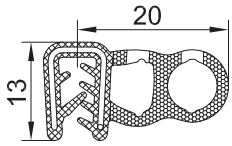
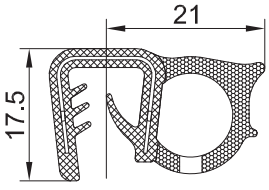
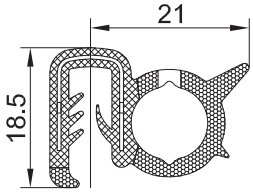
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
 Drawing matches to A3224/4	A3224/2* A3224/4 A3224/6 steel carrier unbroken	black black black	1,0–2,5 2,0-4,0 5,0-6,0	75 75 75	4500 75 75
	A3169* wire carrier	black	3,5-5,0	50	3000
	A3812* steel carrier unbroken	black	3,0-4,0	50	3600
	A3757*	black	2,0-4,0	50	4000
	A3114 steel carrier unbroken	black	5,0-9,0	50	50
	A3547* steel carrier unbroken	black	2,0–4,0	50	3000

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Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Co-extrusion profiles

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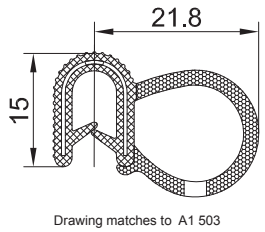
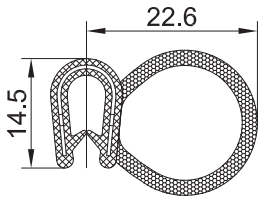
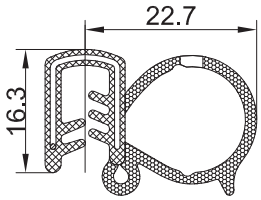
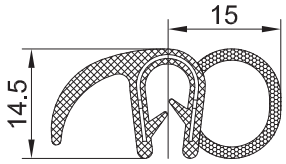
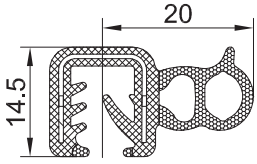
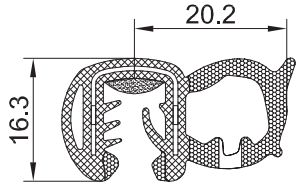
 Drawing matches to A1 503	A1 503 steel carrier unbroken	black	1,0-3,5	1x50	50
	A2 558* (CR) oil resistant steel carrier unbroken	black	1,0-3,5	3x25	75
	A2 554 steel carrier unbroken	black	1,5-3,5	2x25	50
	A3813* wire carrier	black	2,0-4,0	50	3600
	A3145* steel carrier unbroken	black	3,0	50	4000
	A3549* steel carrier unbroken	black	4,0-6,0	50	3000
	A4844-BU* steel carrier broken with Butyl	black	5,0	75	3000

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Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

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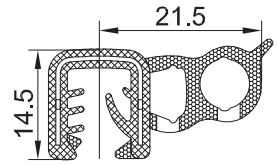
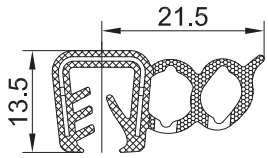
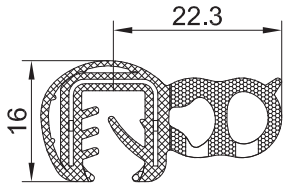
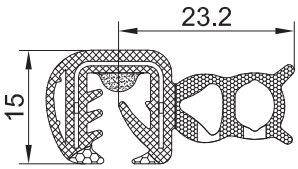
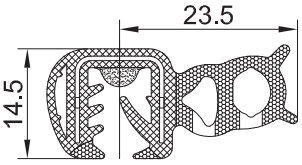
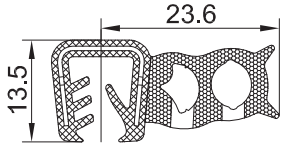
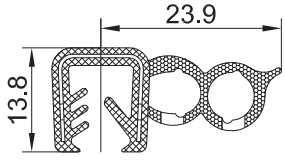
 Drawing matches to A3725	A3725* A3725-BU* with Butyl	black black	5,0-6,0 5,0-6,0	50 50	3000 3000
	A3104* steel carrier unbroken	black	5,0-6,0	50	4000
	A4576 steel carrier broken	black	5,0-6,0	50	50
	A3729 steel carrier broken with Butyl	black	5,0-6,0	50	4000
	A3578* steel carrier unbroken	black	5,0-6,0	50	4000
 Drawing matches to A3467	A3467* A3467-BU* steel carrier unbroken with Butyl	black black	5,0-6,0 5,0-6,0	50 50	4000 4000
	A3348* steel carrier unbroken	black	5,0-6,0	75	3600

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Co-extrusion profiles

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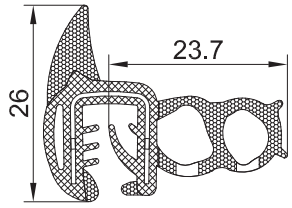
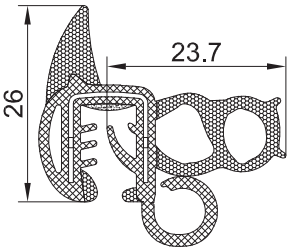
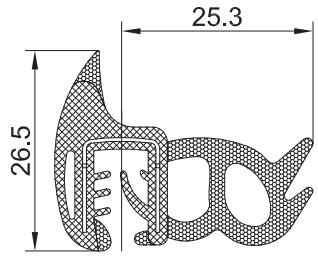
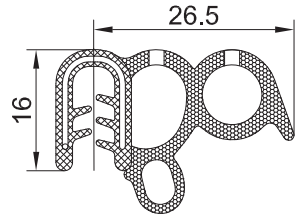
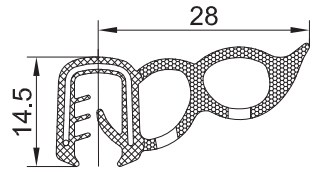
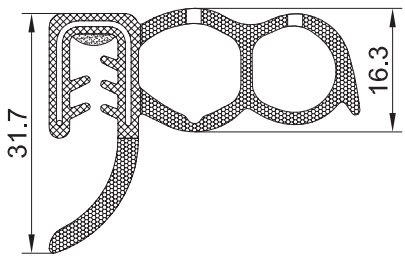
	A4714* steel carrier unbroken	black	4,0-5,0	50	3000
	A4718-BU* steel carrier unbroken with Butyl	black	4,0-5,0	35	3000
 Drawing matches to A3560	A3560* steel carrier broken A4949* steel carrier unbroken	black black	5,0 5,0	50 50	3000 3000
	A2 548 wire carrier	black	1,5-3,5	2x25	50
	A3156* wire carrier	black	3,0	52	3120
	A4667-BU* wire carrier with Butyl	black	3,0-4,0	35	2800

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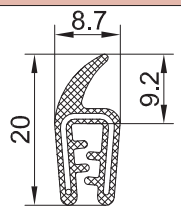
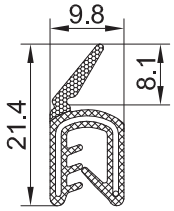
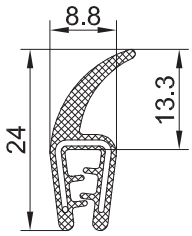
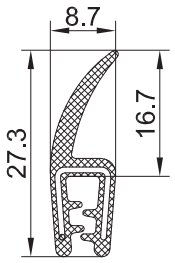
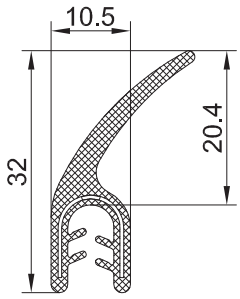
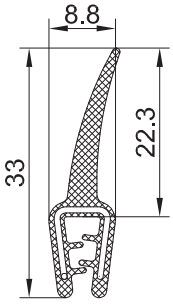
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A1 502 wire carrier	black	1,0-2,0	2x50	100
	A4322* wire carrier	black	2,0-3,0	50	3000
	A1 501 wire carrier	black	1,0–2,5	3x50	150
	A1 521 wire carrier	black	1,0–3,0	2x50	100
 Drawing matches to A3605	A3592* steel carrier unbroken A3605* with sliding varnish coating	black black	2,0-4,0 2,0-4,0	2x25 2x25	4000 4000
	A1 500 wire carrier	black	1,0-2,5	50	50

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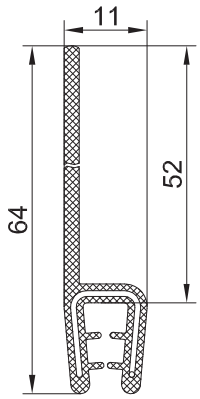
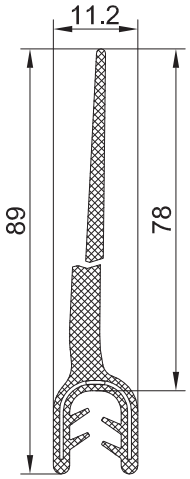
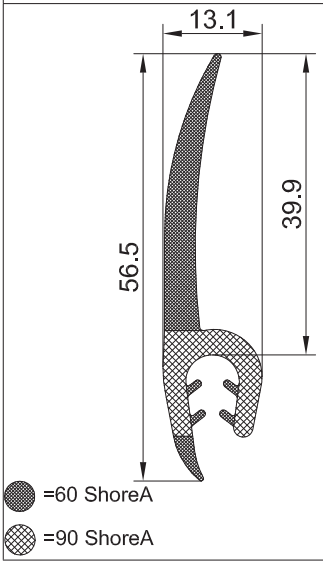
Soft rubber/Sponge rubber EPDM with embedded steel carrier

Co-extrusion profiles

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A2 612*	black	3,0-4,0	2x20	4000
	A3655*	black	2,0-4,0	2x20	2400
	A3300* without metal carrier	black	4,0-6,0	sold only in cut length	7500

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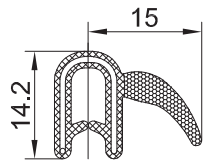
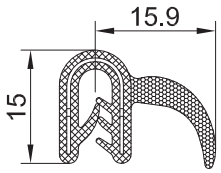
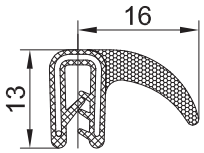
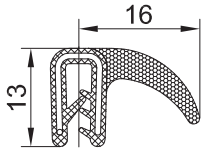
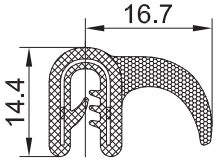
Soft rubber/Sponge rubber EPDM with embedded wire / steel carrier

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A2 511 wire carrier	black	1,0-3,0	3x50	150
	A3343* steel carrier broken or unbroken	black	2,0	100	4000
	A3074* wire carrier	black	1,0-2,0	2x50	4000
	A3228* with sliding varnish coating wire carrier	black	0,5-2,0	2x50	100
	A2 523 steel carrier unbroken	black	1,0-2,5	2x50	100

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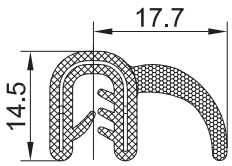
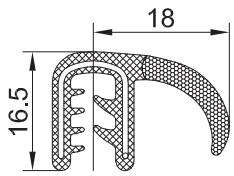
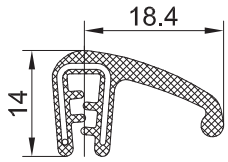
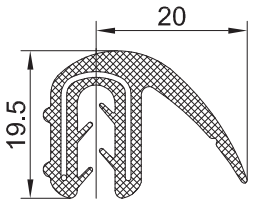
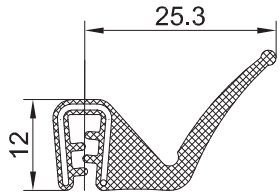
Soft rubber/Sponge rubber EPDM with embedded wire carrier

Co-extrusion profiles

Design	Article reference	Colour	Clamping range [mm]	Sales unit [m]	Minimum order
	A3518 steel carrier one-sided broken	black	1,25-2.,0	2x50	100
	A3276*	black	2,0-3,0	50	2400
	A1 520	black	1,0-2,5	2x50	100
	A1 526*	black	1,0-3,5	100	2500
	A1 528*	black	1,0-2,5	50	3000

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Glazing profiles

Our Delivery & Manufacturing Program includes glazing profiles for a window pane thickness from 2,5 to 14 mm. For a professional assembly you will need the corresponding filler section, as well as the assembly tool (tool set article reference # H1 000)

In case you can`t find any suitable profile for your application, we are able to design a custom profile from a drawing or a sample to suit your application.

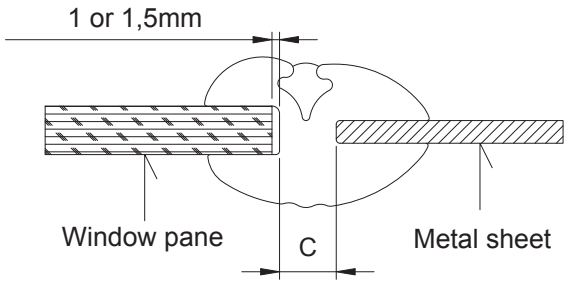
Vulcanized frames and rings

Upon request we are able to provide closed frames and rings. Our manufacturing is equipped with a variety of vulcanizing tools in order to produce finished products. Small quantities can also be produced on short notice.

Calculation of window pane dimensions

1. Core thickness „C“ up to 7mm
   Sheet metal opening -2 x „C“ - 2 x 1 mm

2. Core thickness „C“ > 7mm
   Sheet metal opening - 2 x „C“ - 2 x 1,5 mm



Calculation of window pane dimensions

3. Core thickness „C“ up to 7mm
   Sheet metal opening + 2 x „C“ + 2 x 1 mm

4. Core thickness „C“ over 7mm
   Sheet metal opening + 2 x „C“ + 2 x 1,5mm

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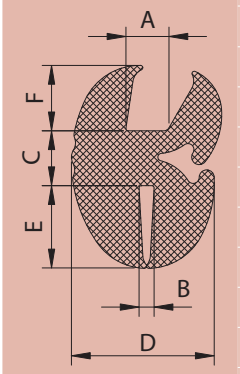
Glazing profiles (EPDM)

Design	Article reference	Dimension [mm]						Bending radius [mm]	Weight [g/m]	Sales unit [m]	Filler	Minimum order
		A	B	C	D	E	F					
	B1 134*	2.5	1.5	7	16	7	7	80	300	15	3	2100
	B2 164*	2.5	3	7	17.9	10.5	11.5	100	360	17	3	1275
	B2 133*	2.5	4.5	7	17.8	10.5	11.5	100	340	32	3	2016
	B1 112	3	1	4	11.6	4.5	6	35	145	20	2	20
	B1 142	3	2	4	10.2	3	3	20	95	50	1	50
	B1 115	4	1.5	4	13.6	5	6	35	165	6x25	2	25
	B1 118	4	1.5	7	16	7	7	80	270	20	3	20
	B1 107	4	2	7.3	18	11	8.7	100	405	15	3	15
	B1 121	4	3	4	12.6	5	6	35	150	25	2	25
	B1 122	4	3	7	16	7	7	80	230	20	3	20
	B2 122 (NBR)*	4	3	7	16	7	7	80	230	20	3	1000
	B1 181*	4	3	7.5	19.5	12.5	9.5	100	430	20	3	1020
	B1 102	4.5	5	7	16	7	7	80	300	20	3	20
	B1 110	5	2	5	15	6	6	100	350	50	3	50
	B1 113	5	2	7.5	19	12.5	9.5	100	410	15	3	15
	B1 127	5	3	7	19	8	8	90	345	20	3	20
	B1 114	5	3	7.5	19	12.5	9.5	100	460	15	3	15
	B1 123	5	5	7	18.4	9	8	90	360	20	3	20
	B1 119	5.5	2	7.3	19	11	8.7	100	400	15	3	15
	B2 173*	5.5	3.5	6	19	10	10	100	400	50	3	2500
	B1 106	6	1.5	7.5	19	12.5	9.5	100	400	15	3	15
	B1 120	6	2.5	7	19	8	8	90	350	20	3	20
	B1 124*	6	3	7.5	19	12.5	9.5	100	410	15	3	1125
	B1 125	6	4	7.5	19	12.5	9.5	100	390	15	3	15
	B1 103	6	6	8.5	19	9.5	9	100	435	15	3	15
	B1 159	7	3	7	20.5	12	8.5	100	415	50	3	50
	B1 139	8	3	7.5	22	12.5	9.5	120	600	15	3	15
	B1 108	8	4	8.5	25	12.5	10	100	620	15	3	15
	B1 148*	10	3	7.5	23	12.5	9.5	120	600	15	3	1020
	B1 104	10	6	7.5	24	12.5	9.5	100	570	15	3	15
	B2 130	14	4	11	29	11	12	100	950	14.5	3	14,5

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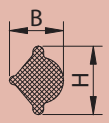
Filler profiles

Design	Filler	Article reference	Dimension [mm]		Material	Colour	Weight [g/m]	Sales Unit [m]	Minimum order
			H	B					
	1	C1 200	5.5	4.5	EPDM	black	18	50	50
	2	C1 201	7.0	6.0	EPDM	black	28	50	50
	3	C1 202	9.5	7.5	EPDM	black	50	50	50
	3	C1 250	9.5	7.5	PVC	black	40	100	100
	3	C1 251	9.5	7.5	PVC	ivory	40	100	100
	3	C1 252	9.5	7.5	PVC	silver	40	100	100
	3	C1 253*	9.5	7.5	PVC	red	40	100	100

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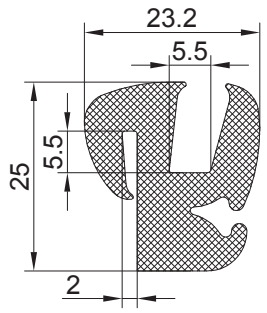
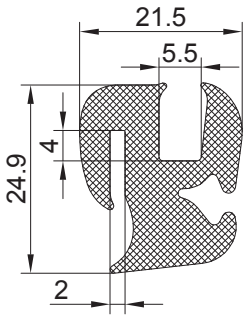
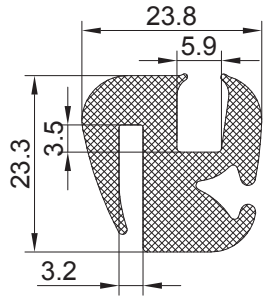
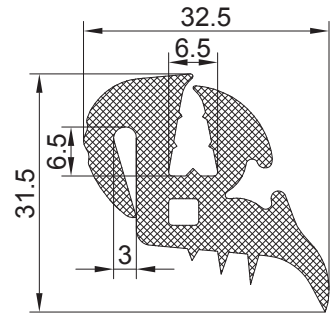
Glazing profiles

Design	Article reference	Bending radius [mm]	Weight [g/m]	Sales unit [m]	Filler	Minimum order
	B1 117	100	430	15	3	15
	B2 149*	100	380	15	3	2100
	B2 144	100	440	25	3	25
	B1 155	100	520	18	3	18

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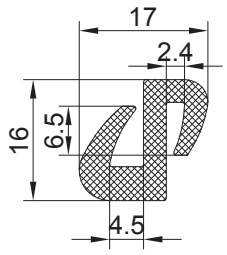
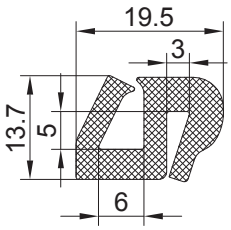
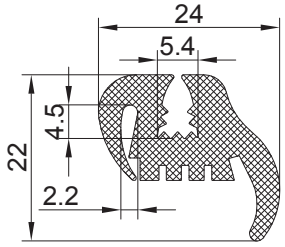
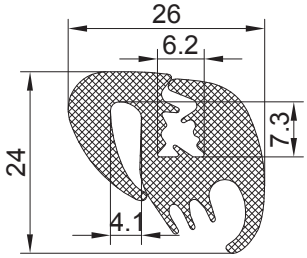
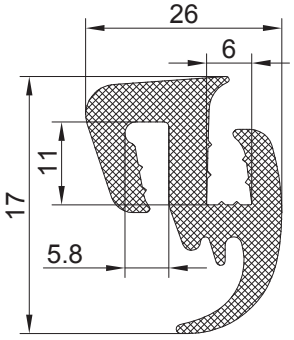
Edging profiles EPDM

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D2 553*	EPDM	black	100	4000
	D1 013	EPDM	black	50	50
	D1 123	EPDM	black	25	25
	D2 499*	EPDM	black	25	2700
	D2 199*	EPDM	black	8x48	1920

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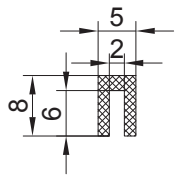
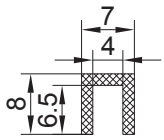
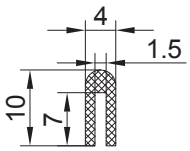
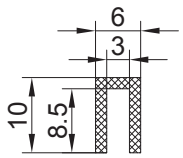
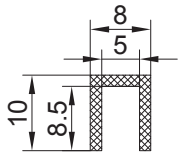
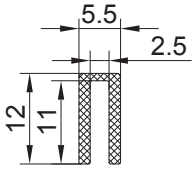
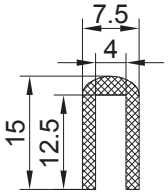
Edging profiles EPDM

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D1 020	EPDM	black	100	100
	D1 021	EPDM	black	4x100	400
	D1 010	EPDM	black	2x100	200
	D1 011	EPDM	schwarz	100	100
	D1 012	EPDM	black	100	100
	D2 539*	EPDM	black	200	4000
	D1 028	EPDM	black	100	100

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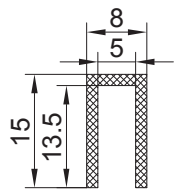
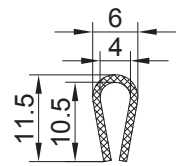
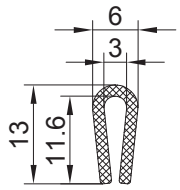
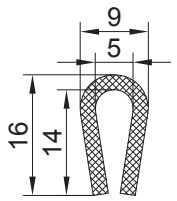
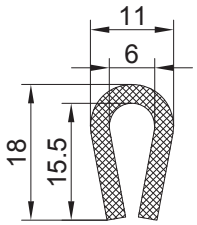
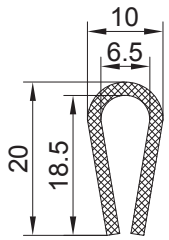
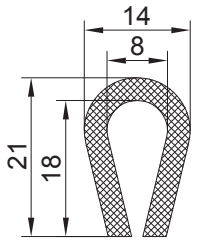
Edging profiles EPDM

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D1 022	EPDM	black	3x100	300
	D1 024	EPDM	black	100	100
	D1 014	EPDM	black	100	100
	D1 034	EPDM	black	100	100
	D1 025	EPDM	black	100	100
	D1 015	EPDM	black	50	50
	D1 026	EPDM	black	3x40	120

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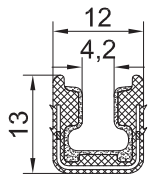
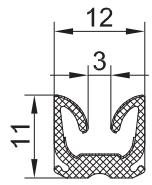
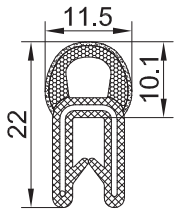
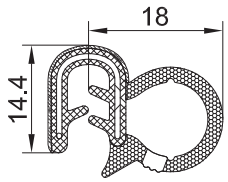
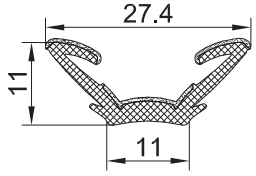
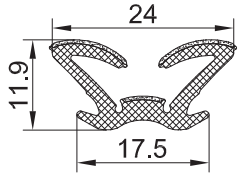
Glass run channels
EPDM - with flock

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D2 358*	EPDM	black	50	6400
	D2 335* without metal carrier	EPDM	black	4x50	6600
	A4635	EPDM	black	100	100
	A4800*	EPDM	black	2x50	2400
	D3 453	EPDM	black	3x50	150
	D3 321	EPDM	black	100	100

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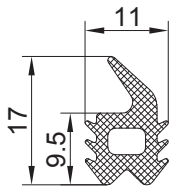
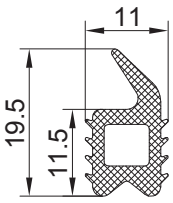
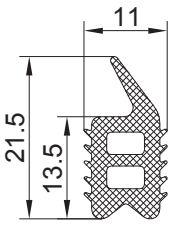
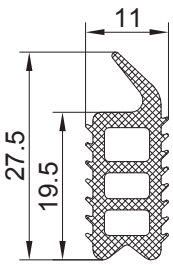
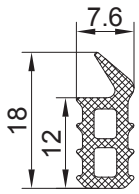
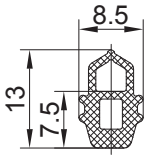
Door Sealing Profiles
Soft PVC and EPDM

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	G1 104	PVC	black	7x20	140
	G1 101	PVC	black	7x20	140
	G1 106	PVC	black	7x20	140
	G1 108	PVC	black	5x20	100
	D1 127	EPDM	black	100	100
	D2 274*	EPDM	black	200	1500

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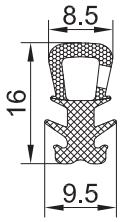
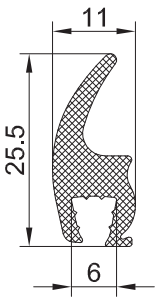
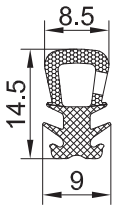
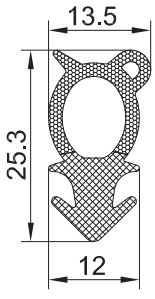
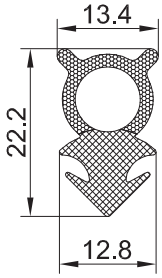
Sealing Profiles
Soft rubber/Sponge rubber

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D2 363*	EPDM	black	200	6000
	D2 169E*	EPDM	black	8x150	2400
	D2 419*	EPDM	black	200	7200
	D2 545*	EPDM	black	100	4000
	D2 544*	EPDM	black	100	6000

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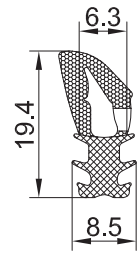
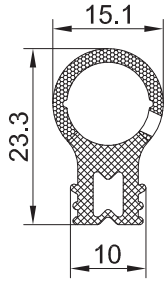
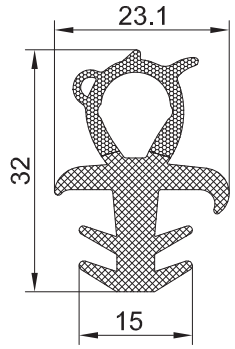
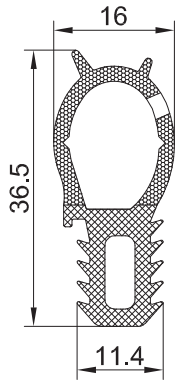
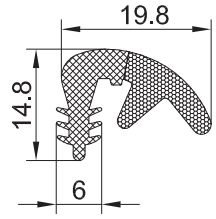
Sealing Profiles
Soft rubber/Sponge rubber

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D2 311*	EPDM	black	200	6000
	D2 184*	EPDM	black	75	4500
	D2 537*	EPDM	black	50	5000
	D2 382*	EPDM	black	50	3000
	D2 538*	EPDM	black	100	8000

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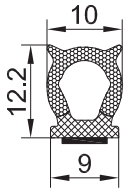
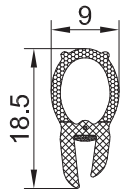
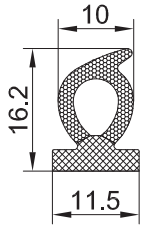
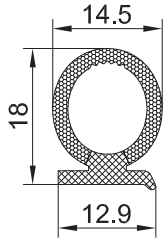
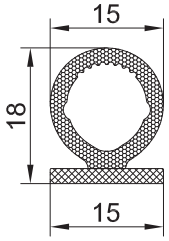
Sealing Profiles
Soft rubber/Sponge rubber

All Profiles from Page 62 - 64 are available without or optionally with AFH-Tape or AF-Tape.

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D3 041-AFH*	EPDM	black	100	3000
	D3 061-BU* with Butyl	EPDM	black	100	5000
	D2 541*	EPDM	black	150	3600
	D2 421*	EPDM	black	100	3600
	D2 390*	EPDM	black	200	4000

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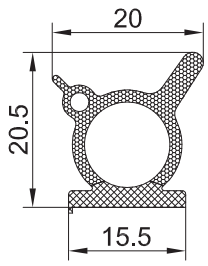
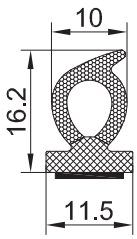
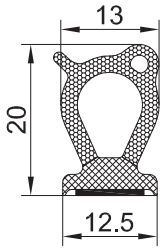
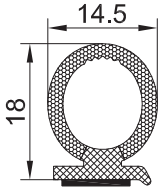
Sealing Profiles
Soft rubber/Sponge rubber

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D2 528	EPDM	black	50	50
	D3 024-AFH*	EPDM	black	5x25	125
	D2 999-AFH*	EPDM	black	50	50
	D2 421-AFH*	EPDM	black	4x25	450

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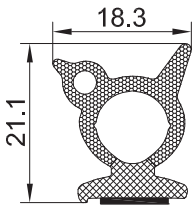
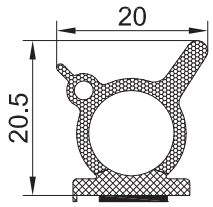
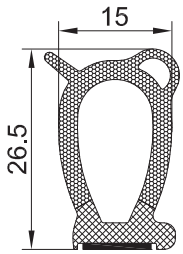
Sealing Profiles
Soft rubber/Sponge rubber

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D3 013-AFH*	EPDM	black	4x25	100
	D2 528-AFH*	EPDM	black	3x25	125
	D2 998-AFH*	EPDM	black	50	50

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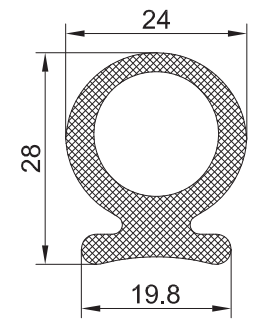
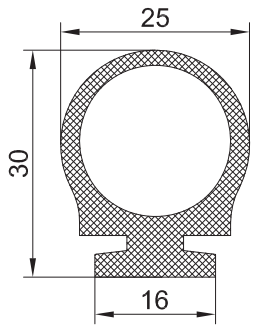
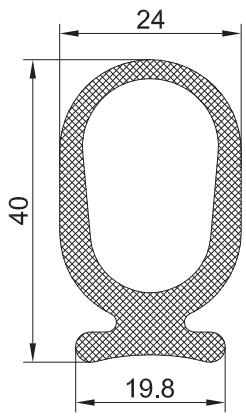
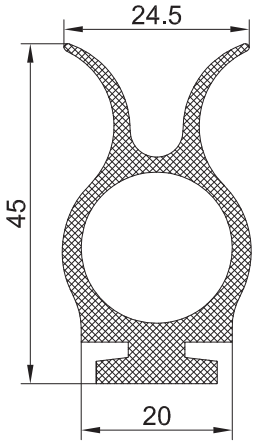
Monoprofiles

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D1 133	EPDM	black	30	30
	D2 193*	EPDM	black	40	3000
	D1 128	EPDM	black	30	30
	E-D2 407*	EPDM	black	50	5000

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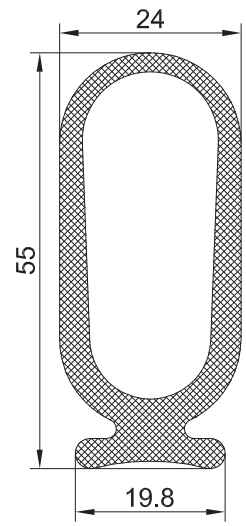
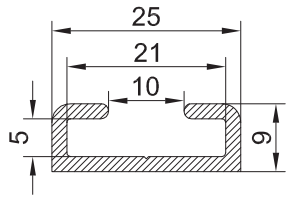
Finger guard profiles

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D1 135	EPDM	black	30	30
	M1 001	Aluminium	-	5	5

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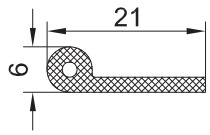
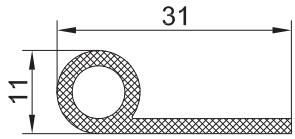
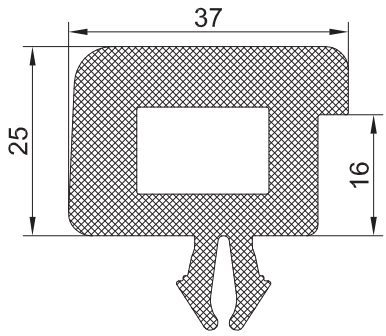
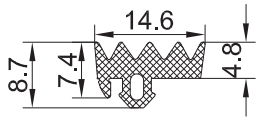
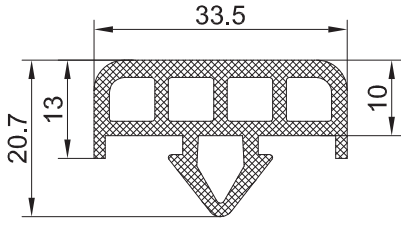
Special profiles - soft rubber

Design	Article reference	Material	Colour	Sales unit [m]	Minimum order
	D1 119	EPDM	black	100	100
	D1 137	EPDM	black	100	100
	D2 230*	EPDM	black	501	1002
	D2 796	EPDM	black	200	6000
	D2 167	EPDM	black	40	40

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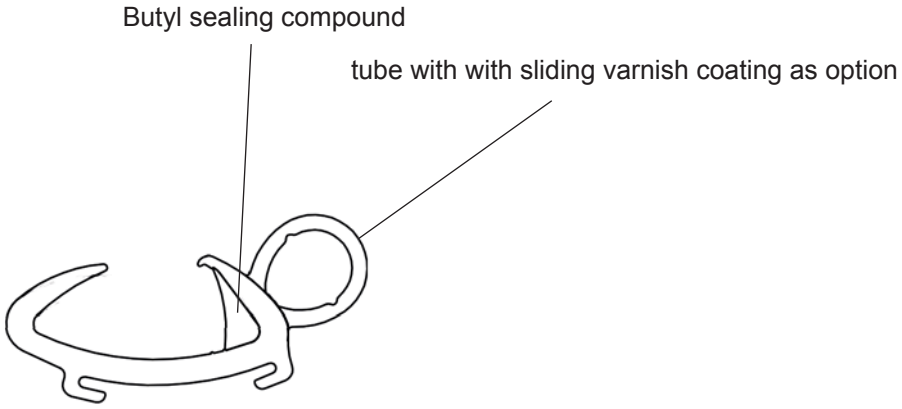
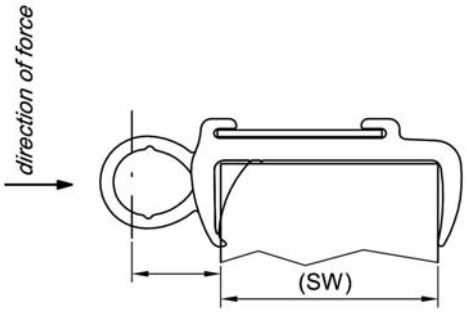
Sandwichprofiles

Profiles for sealing of curved and flat panes



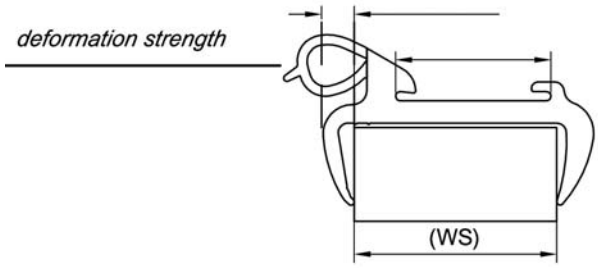
For curved panes with Sandwich thikness 24 - 35 mm

Example of installation:



For flat panes with Sandwich thikness 29 - 34 mm

Example of installation:



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Product description

Cell rubber profiles of EPDM, CR, NBR, NR in black or light gray with normal outer skin

Cell rubber is a cellular, soft-elastic material of rubber base. During the vulcanization process the material forms a partly open and partly closed cell structure, under the surface of a closed shell.

The specific weight of the cell rubber profiles, ranges from 0.4 to 0.8 grams per cm³. For the production of cell rubber, inter alia, natural rubber (NR), chloroprene rubber (CR), nitrile rubber (NBR) or ethylene-propylene rubber (EPDM). The selection of elastomers depends on the application of the finished part.

The production of cell rubber takes different: forms vulcanization or by extrusion.

Molded parts or sections of cell rubber are light and durable. They create superior sealing because of their bow deformability pressure, and adapt to varying material tolerances like no other material.

Foam rubber profiles are found in many highly demanding sealing applications.

Some sections, half-round profiles, square profiles and special sections

All cell rubber profiles are normal, closed outer skin. In order to comply with precise length dimensions are available the cell rubber profiles with thread reinforcement.

Manufacturing tolerance ISO 3302-1, E3, L3.

Self / Acrylic Foam

All square profiles, and the majority of special profiles, can be one sided adhesive (SK), or can be durable adhesive (AF) equipped upon request.

The gluing of the AF-Tape can be applied by either of the following methods:
a) with hotmelt-heatbonding
b) with Primer on cold bonding

Best when used to hold rubber seal in place during installation or when compressed between two panels. No recommender for high shear applications.

AF film is unsed in indoor / outdoor applications with-in the automotive sector; especially where a high level of cohesion force, combined with excellent shock and weather resistance is required (permanent self-adhesive).

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Round Cords

Dimensions mm	Bulk lenght m	EPDM black	EPDM light-grey	CR black
2,0	200	●	●	●
2,5	200	●	●	-
3,0	200	●	●	●
3,5	200	●	●	-
4,0	200	●	●	●
4,5	200	●	●	-
5,0	200	●	●	●
6,0	200	●	●	●
7,0	200	●	●	●
8,0	200	●	●	●
9,0	200	●	●	-
10,0	100	●	●	●
11,0	100	●	●	-
12,0	100	●	●	●
13,0	50	●	●	-
14,0	50	●	●	-
15,0	50	●	●	●
16,0	50	●	●	●
18,0	25	●	●	●
20,0	25	●	●	●
22,0	25	●	●	●
25,0	25	●	●	●
30,0	20	●	●	●
35,0	20	●	●	●
40,0	20	●	●	-
45,0	10	●	●	-
50,0	10	●	●	-

● Delivery time: immediately on stock/subject to being unsold
- upon request

Other colours, qualities and sections upon request. Design modifications reserved..

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Square profile cords

All square profiles, can be one sided adhesive (SK), or can be durable adhesive (AF) equipped. Minimum order quantity is equal to the bulk length

Dimensions mm	Bulk length m	EPDM black	EPDM light grey	CR black	Self-adhesive on broader side
2x8	100	●	●	●	●
2x10	100	●	●	●	●
2x15	100	●	●	●	●
2x20	100	●	●	-	●
2x25	50	●	●	-	●
2x50	50	●	●	-	●
3x5	100	●	●	-	●
3x10	100	●	●	●	●
3x15	100	●	●	●	●
3x18	100	●	●	●	●
3x20	100	●	●	●	●
3x30	50	●	●	●	●
3x40	100	●	●	●	●
3x50	50	●	●	-	●
4x6	100	●	●	-	●
4x8	100	●	●	●	●
4x10	50	●	●	●	●
4x12	50	●	●	●	●
4x15	100	●	●	●	●
4x20	100	●	●	●	●
4x25	50	●	●	-	●
4x30	50	●	●	●	●
4x40	50	●	●	-	●
4x50	50	●	●	-	●
5x5	100	●	●	●	●
5x10	100	●	●	●	●
5x12	100	●	●	●	●
5x15	50	●	●	●	●
5x20	50	●	●	●	●
5x25	50	●	●	●	●
5x30	50	●	●	●	●
5x40	50	●	●	●	●
5x50	25	●	●	●	●
5x60	25	●	●	-	●
6x6	100	●	●	●	●
6x10	50	●	●	●	●
6x12	50	●	●	●	●
6x15	100	●	●	●	●
6x20	50	●	●	●	●

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Square Profile Cords

All square profiles, can be one sided adhesive (SK), or can be durable adhesive (AF) equipped. Minimum order quantity is equal to the bulk length

Dimensions mm	Bulk length m	EPDM black	EPDM light grey	CR black	Self-adhesive on broader side
6x25	50	●	●	●	●
6x30	50	●	●	-	●
6x35	25	●	●	●	●
6x40	25	●	●	-	●
6x50	25	●	●	-	●
7x10	50	●	●	-	●
7x15	50	●	●	-	●
7x20	50	●	●	-	●
8x8	50	●	●	●	●
8x10	50	●	●	●	●
8x12	50	●	●	●	●
8x15	50	●	●	●	●
8x16	50	●	●	●	●
8x18	50	●	●	●	●
8x20	50	●	●	●	●
8x25	50	●	●	●	●
8x30	50	●	●	●	●
8x40	50	●	●	-	●
8x50	50	●	●	-	●
9x16	50	●	●	-	●
9x23	50	●	●	-	●
10x10	25	●	●	●	●
10x12	25	●	●	●	●
10x15	50	●	●	●	●
10x16	50	●	●	●	●
10x18	50	●	●	●	●
10x20	50	●	●	●	●
10x25	50	●	●	●	●
10x30	25	●	●	●	●
10x35	25	●	●	●	●
10x40	25	●	●	●	●
10x50	25	●	●	●	●
10x60	25	●	●	-	●
10x70	50	●	●	-	●
11x11	50	●	-	-	●
11x17	50	●	-	-	●
12x12	50	●	●	●	●
12x15	50	●	●	●	●
12x20	50	●	●	●	●

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Square profile cords

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Dimensions mm	Bulk lenght m	EPDM black	EPDM light grey	CR black	Self-adhesive on broader side
12x25	50	●	●	●	●
12x40	50	●	●	-	●
15x15	50	●	●	●	●
15x20	25	●	●	●	●
15x25	25	●	●	●	●
15x30	25	●	●	●	●
15x35	25	●	●	-	●
15x40	50	●	●	●	●
15x45	25	●	●	-	●
15x50	25	●	●	-	●
16x30	25	●	●	●	●
18x18	25	●	●	●	●
18x25	25	●	●	●	●
20x20	25	●	●	●	●
20x25	25	●	●	●	●
20x30	25	●	●	●	●
20x40	25	●	●	●	●
20x45	25	●	●	-	●
20x50	25	●	●	●	●
20x60	10	●	●	●	●
25x25	25	●	●	●	●
25x30	25	●	●	●	●
25x35	25	●	●	-	●
25x40	25	●	●	●	●
30x30	20	●	●	●	●
30x40	15	●	●	●	●
30x50	15	●	●	●	●
40x40	10	●	●	●	●
40x50	10	●	●	-	●
45x50	10	●	●	-	●
50x50	10	●	●	-	●

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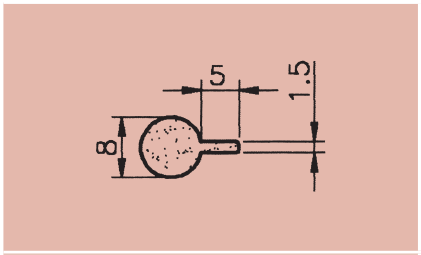
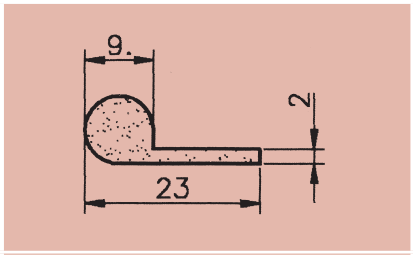
Special profiles EPDM - black

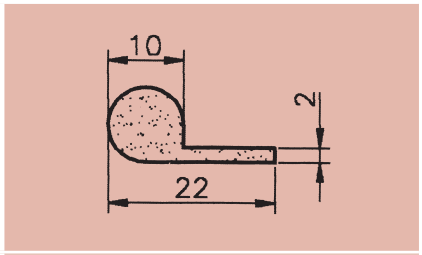
The majority of special profiles, can be one sided adhesive (SK), or can be durable adhesive (AF) equipped upon request.



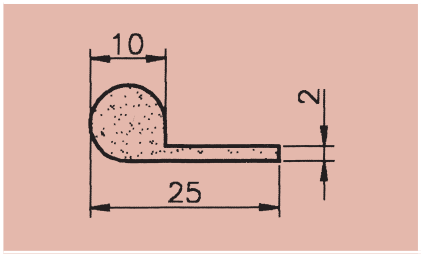
Art.-ref. # E1 516 D



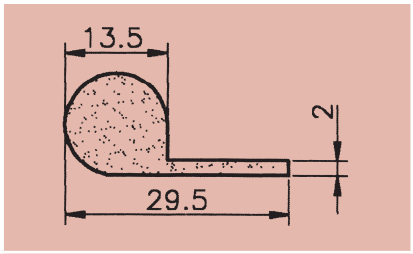
Art.-ref. # E1 512 D



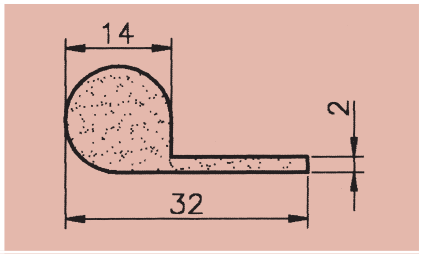
Art.-ref. # E1 504 D



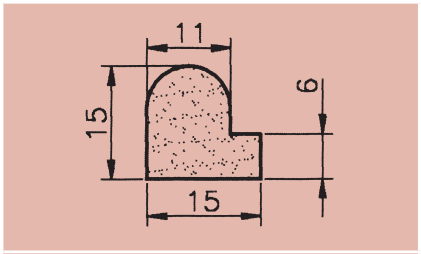
Art.-ref. # E1 511 D



Art.-ref. # E1 514 D



Art.-ref. # E1 515 D



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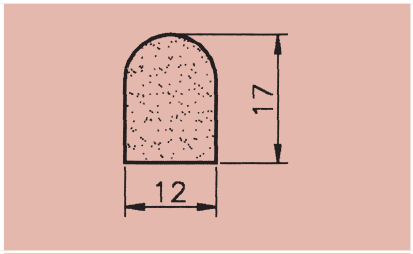

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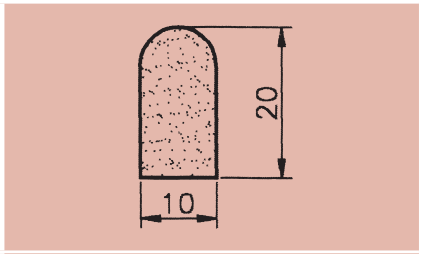

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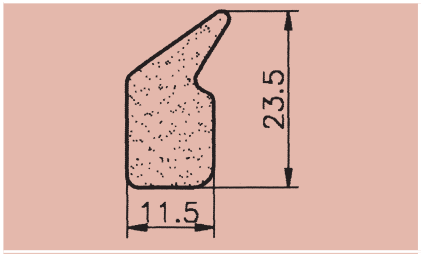

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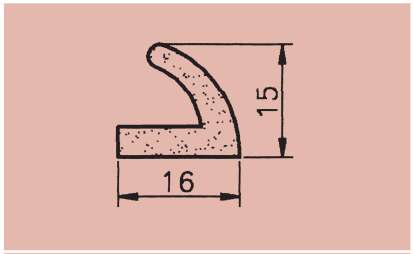

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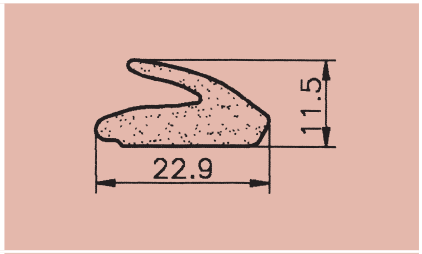

Art.-ref. # E1 501 D

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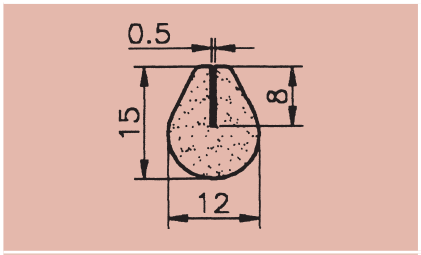
Special profiles EPDM - black

The majority of special profiles, can be one sided adhesive (SK), or can be durable adhesive (AF) equipped upon request.



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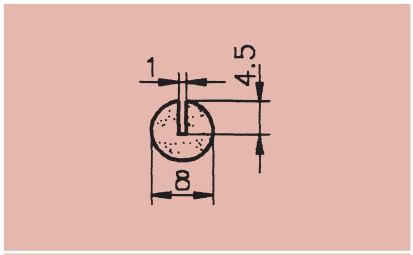

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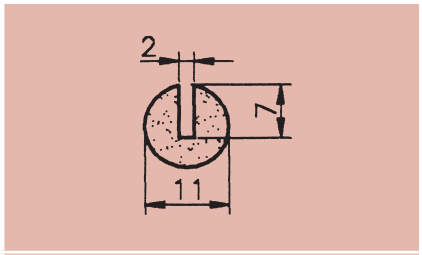

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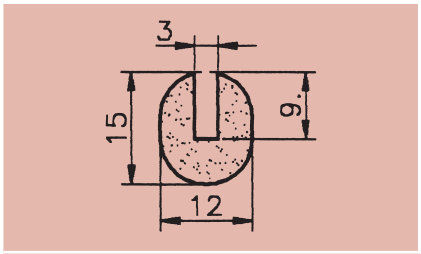

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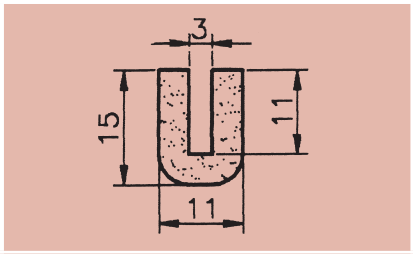

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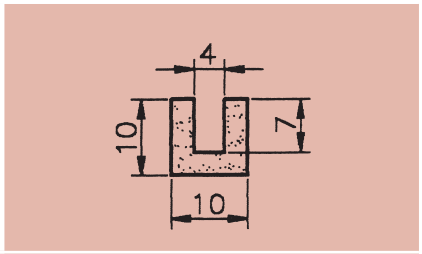

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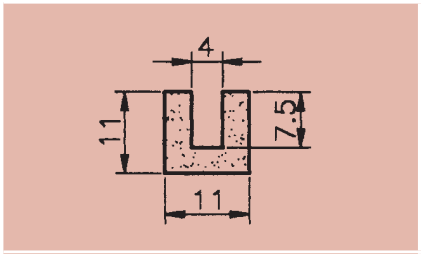

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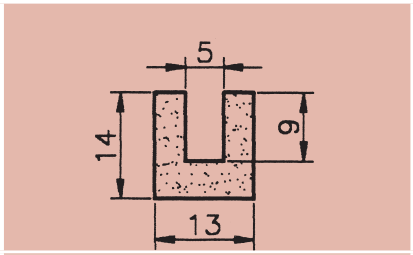

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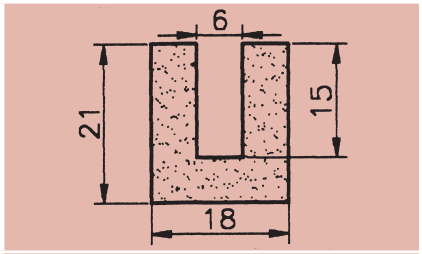

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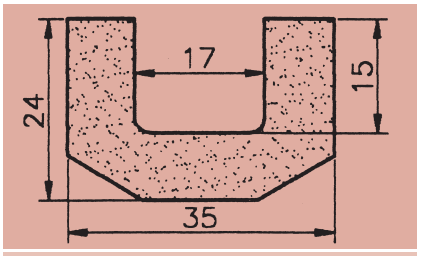

Art.-ref. # E1 523 D

●	Delivery time: immediately on stock/subject to being unsold
-	upon request

Delivery time: immediately if on stock; subject to being sold.
Other colours, quantities and sections upon request. Design modifications reserved.

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Special Profiles

Article reference	Bulk length m	EPDM black	EPDM light grey	Minimum order
E1 500 D	**50**	●	-	50
E1 501 D	**50**	●	-	50
E1 503 D	**50**	●	-	50
E1 504 D	**50**	●	-	50
E1 506 D	**50**	●	-	50
E1 509 D	**50**	●	-	50
E1 510 D	**50**	●	-	50
E1 511 D	**50**	●	-	50
E1 512 D	**25**	●	-	25
E1 514 D	**25**	●	-	25
E1 515 D	**50**	●	-	50
E1 516 D	**100**	●	-	100
E1 517 D	**50**	●	-	50
E1 519 D	**50**	●	-	50
E1 520 D	**50**	●	-	50
E1 521 D	**50**	●	-	50
E1 522 D	**50**	●	-	50
E1 523 D	**15**	●	-	15
E1 524 D	**50**	●	-	50
E1 525 D*	**50**	-	-	2000
E1 526 D	**50**	●	-	50
E1 530 D	**50**	●	-	50

● Delivery time: immediately on stock/subject being unsold

- upon request

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Injection molding technique

With injection moulding technique it is possible to quickly and economically manufacture complex shaped plastic parts in nearly every size.
It is also possible to choose the character of the surface of the plastic product. Smooth surfaces for optical applications, grained surfaces for touchable applications, grooves and engraved surfaces are all available as samples.

Simplified, the process is the following: with an injection moulding machine, plastic granulate is heated within a cylindrical spiral. This produces a homogenius compound which is easily shapeable. This compound is pressed into the appropriately shaped injection moulding tool under high pressure. Both halves of the tool are held together with high pressure and after a short cooling time they open again. The finished injection moulding part is ejected by an ejection system.

Ind addition to pure injection moulded parts, we are also able to manufacture sub-assembly specifications with an additional assembled sealing.

We continuously modernise and improve the technical processes to ensure exceptional quality of our injection moulded parts. The processes are also online quality monitored.

With our internal die shop we are able to manufacture tools according to individual customer requirements.
Our development division is equippet with CAD workstations so it is possible to exchange drawings in formats like Solid Edge, Auto Cut, Step and Iges online.

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Injection molding technique

The following injection

- Engel

Clamping force:	250 t
max. injection capacity:	2000 cm³
max. aclamping area:	700x1000mm
Materials:	ABS, PVC, PP, PA, PS, TPE

- Engel

Clamping force:	90 t
max. injection capacity:	ca. 200 cm³
max. aclamping area:	220x500mm
Materials:	ABS, PVC, PP, PA, PS, TPE

- Boy 22 horizontal machine-no. 39191,
  vertical machine-no. 39217 and 33184

Clamping force:	22 t
max. injection capacity:	44 cm³
max. aclamping area:	250 x 200 mm
Materials:	ABS, PVC, PP, PA, PS, TPE, EPDM

- LWB machine-no. 332367
  Typ HCE-TPE/EPDM

Clamping force:	100 t
max. injection capacity:	250 cm³
max. aclamping area:	400 x 400 mm
Materials:	TPE, EPDM

- LWB machine-no. 312184

Clamping force:	30 t
max. injection capacity:	250 cm³
max. aclamping area:	290 x 260 mm
Materials:	EPDM

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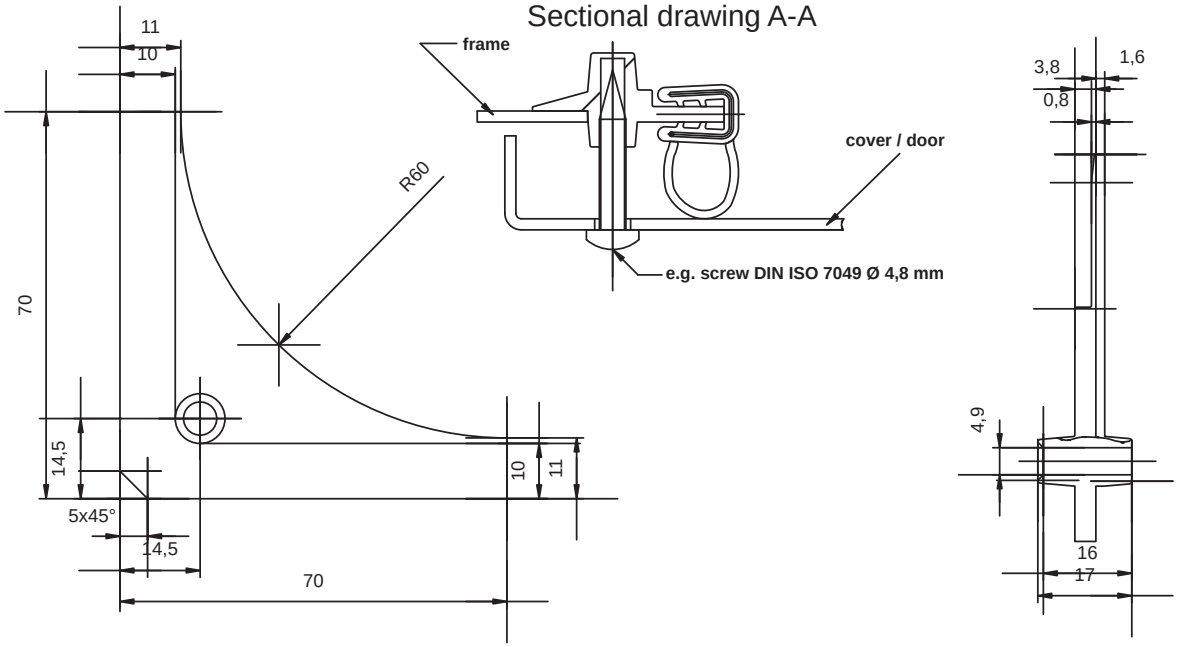
Corner radius for self locking sealing profiles

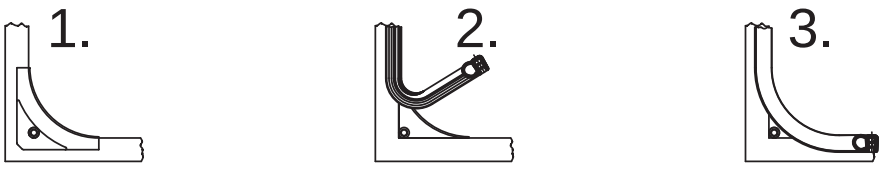
The corner radius is used to assemble self locking sealing profiles to 90° inside corners. It creates a radius and enables an easier installation.

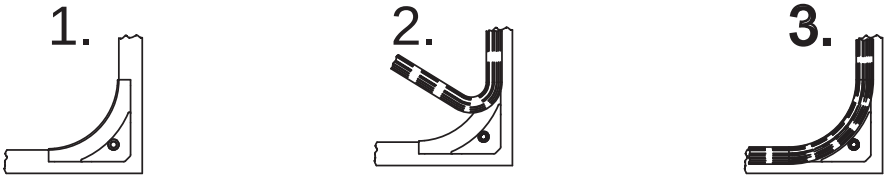
- The corner radius is fixed to the flange of the body profile by the self locking sealing profile and kept in position.
- No welding and grinding of junction plates due to the corner radius.
- The corner radius gets inserted and installed with the sealing profile after painting the frame.
- Due to the integrated screw connector at the inserted corner radius, no additional hardware is required.

Sectional drawing A-A



Operation work flow when assembling





Article-reference	Material
K2 103	PA6 30GF black

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Technical apendix
Material overview

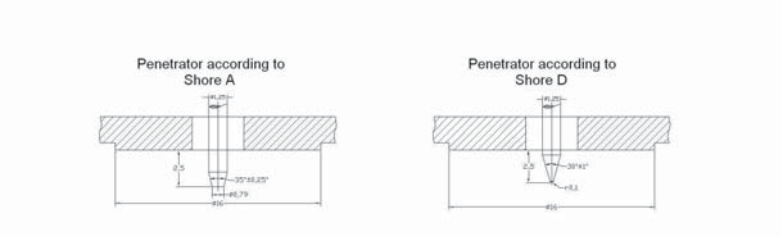
Hardness test of rubber elastic substances (Elastomer)

The hardness is an iportant parameter of rubber elastic substances (elastomer). There are several standardized techniques to measure the hardness. The check is made according to Shore A or Shore D and IRHD (International degree of hardness of rubber) / DIN53519

Hardness test according to DIN 53505, Shore A and D

This generally applied procedure enables a fast identification of the hardness. The tests conducted in a test laboratory are made according to the terms of DIN53505. At the test for Shore A, the resistance against infiltration of a truncated cone needed under a selected compressive force is measured. The hardness can be measured with a stand- or pocket tool. With pocket tools uncertainty of measurement can`t be exluded because of warying contact pressure. A sample which is not thick enough will lead to higher measured data (if the sample is less thick than 6 mm it is recommended to measure according to IHRD). A test too close to the border of the sample may lead to an artificially low result.

Shore A	Technical usage
100 98 95 92	high hardness
90 88 85 82 80	hard
78 75 72 70 68	medium hard
65 62 60 58 55 52	medium soft
50 48 45 42 40	soft
38 35 32	high softness



Hardness test according to IRHD/DIN 53519

With this method the hardness of rubber samples is determined. It is measured how a selected bowl is deformed under a selected pressure into the sample This test is made with special test control units, and is generally not matchable to the hardness test according to Shore A.

SI and legal units

Measurement	Formula symbol	SI-unit (Système Internationale d`Unitès)	More accredited units
Absorbed dose	D	Gy (gray)	
Amount of substance	n	mol (Mol)	
Amperage	I	A (ampere)	
Area	A	m²	a (Are), ha (hectare)
Electr. conductance	G	S (siemens)	
Electr. inductance	L	H (Henry)	
Electr. resistance	R	Ω (ohm)	
Electr. potential	U	V (volt)	
Energy	W, E	J (joule)	kWh (kilowatt hour)
Force	F	N (newton)	
Frequency	f	Hz (hertz)	1/s
Gravity acceleration	g	m/s²	
Illuminance	E	Lx (lux)	
Length	l	m (metre)	µm (micrometre), mm, cm, dm, km
Light level	I	cd (candela)	
Power	P	W (watt)	
Pressure	p	Pa (pascal)	bar
Radioactivity	A	Bq (berquerel)	
Rational speed	n	1/s	1/min, min⁻¹, rpm
Sound power level	L_p	W/W	dB (decibel)
Sound pressure level	L_p	Pa/Pa	dB (decibel)
Speed	v	m/s²	km/h
Temperature	T, t	K (Kelvin)	°C
Time	t	s (second)	min, h (hour), d (day), a (year)
Torsional moment	M	Nm (Newtonmetre)	
Volume	V	m³	l, L (litre)
Weight	m	kg (kilogramme)	g, t, u (atomic mass unit), Kt (metric carat)
Weight force	G	N (newton)	

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Material overview

Abbreviation	Chemical Name	Trade names® (examples)
Elastomers		
ACM	Acrylic rubber	Cyanacrylm Europrene AR
AEMI	Ethylene-acrylic-rubber	Vamac
PUR (AU) (EU)	Polyurethane-rubber (Polyester-urethane-rubber) (Polyether-urethane-rubber)	Vulkollan, Desmopan, Moltopren, Elastollan, Urepan, Elsthane, Simputhan
BIIR	Bromobutyl rubber	
CIIR	Chlorobutyl rubber	Esso Butyl HT 10
CO	Epichlorohydrin polymer	Herclor H, Hydrin 100
CR	Chlorobutadiene rubber	Neoprene, Baypren
CSM	Chlorosulfonated polyethylene	Hypalon
ECO	Ethylene oxide epichlorohydrin rubber	Hydrin,Herclor, Epichlomer
EPDM EPM	Ethylene propylene diene monomer rubber Ethylene probylene copolymer	Nordel, DSM (Keltan), Dutral, Buna EP
FFPM (FFKM)	Perfluoroelastomer	Kalrez, Simriz
FPM (FKM)	Fluoroelastomer	Viton, Fluorel, Tecnoflon
FVMQ Q, MQ, MVQ, VMQ	Fluorosilicone Methyl silicone Vinyl methyl silicone	Silopren, Silastik, Silicone, Rhodorsil
IIR	Butyl rubber	Polysarbutyl, Esso Butyl, Polysar Butyl
NBR X-NBR NEM (H-NBR)	Acrylonitrile butadiene rubber Carboxylated nitrile rubber Hydrogenated acrylonitrile butadiene rubber	Perbunan N, Chemiegum, Buna N, Nitril
NR	Natural rubber	Para
SBR	Styrene butadiene rubber	Buna SL, Soloprene, Dunatex, Krynol

Thermoplastics		
ABS	Acrylonitrile butadiene styrene	Lustran, Novodur, Terluran
PA	Polyamide	Nylon, Sustamid, Durethan, Rilsan
PC	Polycarbonate	Makrolon, Lexan, Sustonat
PE (PE-HMW, PE-UHMW)	Polyethylene	Hostalen, Baylon, Sustylen (RCH 500, RCH 1000)
PEEK	Polyaryletherketone	Victrex, Ultrax
PEI	Polyetherimide	Ultem
PES	Polyethersulfone	Ultrason
PMMA (Acrylglass)	Polymethyl methacrylate	Plexiglass, Resarit, Degalan, Altuglas
POM	Polyoxymethylene	Delrin, Hostaform, Ultraform, Sustarin
PP	Polypropylene	Novolen, Hostalen PP, Vestolen P, Eltex P
PSU	Polysulfone	Udel, Ultrason S
PTFE	Polytetrafluoroethylene	Teflon, Hostalflon TF, Fluon
PVC	Polyvinyl chloride	Hostalit, Mipulam, Trovidur, Vestolit, Vnidur
PVDF	Polyvinylidene fluoride	Solef, Dyfor

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Material overview

Abbreviation	Operating temperatures	Stability (List of resistance on the folloiwing pages)					Characteristics
		Petro-leum Oil	Gaso-line	Sulphuric acid (conc.)	Wa-ter	Ozo-ne	
Elastomers							
ACM	approx -25 to +130 °C	1	2	-	3	2	Seals and molded parts with petroleum oil contact, good aging and ozone resistance
AEM	approx -40 to +150 °C	1	2	-	3	2	Seals and molded parts, good resistance to petroleum oil, water and coolants. Good weather and ozone resistance
PUR (AU) (EU)	approx. -30 to + 80 °C	2 (AU)	1	3	3	1	Versatile material. Very high notch impact strength and resistance to wear and tear. Good stability in water, petroleum oil and fats. Very good aging and ozone resistance
BIIR	approx. -40 to +150 °C	3	3	2	1	3	Good resistance to acids, glycol brake fluids, hot water.
CIIR	approx. -40 to +140 °C	3	3	2	1	3	Good resistance to acids, glycol brake fluids, hot water.
CO	approx. -40 to +140 °C	1	2	-	1	1	Low gas permeability, good weather and ozone resistance.
CR	approx. -45 to +100 °C	3	2	3	2	3	Good mechanical properties, weather and ozone resistant. Does not spontaneously combust.
CSM	approx. -20 to +120 °C	3	3	2	1	1	Good chemical, aging and ozone resistance, flammable
ECO	approx. -40 to +140 °C	1	2	-	1	1	Good resistance to petroleum oil and fats, to gases such as for example propane and butane.
EPDM EPM	approx. -50 to +150 °C	3	3	1	1	1	Versatile material (sealing). Good stability in hot water, very good aging, weather and ozone resistance.
FFPM (FFKM)	approx. -15 to +230 °C	1	1	1	1	1	Excellent chemical resistance, for safety related applications
FPM (FKM)	approx. -20 to +200 °C	1	1	1	1	1	Versatile material, very good oil and chemical resistance, heat resistant
FVMQ Q, MQ MVQ, VMQ	approx. -80 to +175 °C approx. -60 to +180 °C approx. -60 to +200 °C	1 2 2	1 3 3	- 3 3	- 1 2	1 1 1	High thermal resistance, aging, ozone, and weather resistant. Good insulating properties. The material FBMQ also has improved resistance to fuels and oils.
IIR	approx. -40 to +150 °C	3	3	1	1	3	Good resistance to acids, glycol brake fluids, hot water.
NBR X-NBR (H.NBR)	approx. -30 to +100 °C approx. -25 to +100 °C approx. -30 to +150 °C	1	2	3	1	3	Versatile material. Seals and molded parts with petroleum oil or fuel contact. NBR has poor ozone and weather resistance. X-NBR is more wear resistant. H-NBR has improved mechanical properties and is abrasion resistant.
NR	approx. -60 to + 80 °C	3	3	3	2	3	High mechanical stability and elasticity, high resistance to alternating bending, flammable.
SBR	approx. -50 to +100 °C	3	3	2	2	3	Improved abrasion- and aging resistance.Good resistance to brake fluid.
Thermoplastics							
ABS	approx. -50 to + 70 °C	1	3	1	1	1	High scratch and impact resistance, chemical resistant. Limited colorfastness.
PA	approx. -40 to +100 °C	1	1	3	1	3	Abrasion resistant and durable. High resistance ratings, good emergency running properties.
PC	approx. -40 to +110 °C	1	3	3	1	1	Durable, impact resistant and weather resistant, almost unbreakable. Good adhesion properties.
PE	approx. -50 to + 90 °C (-150/-200 to + 80 °C)	2	2	2	1	3	Good chemical stability, very high mechanical stability. High break resistance.
PEEK	approx. -40 to +250 °C	1	1	3	1	1	Very good chemical resistance, universal application. High thermal resistance.
PEI	approx. -40 to +170 °C	3	3	3	1	-	Thermostable, durable, good chemical resistance.
PES	approx. -40 to +180 °C	1	1	3	1	-	High thermostability, stable, durable.
PMMA	approx. -40 to + 75 °C	1	1	2	1	1	Weather resistant, transparent, glass-clear, good adhesion properties.
POM	approx. -40 to +100 °C	1	1	3	1	3	Good mechanical properties, abrasion resistant, dimensionally stable, good chemical resistance.
PP	approx. - 5 to +100 °C	2	2	1	1	3	High thermostability, hard and rigid, susceptible to cold, good welding properties, flammable.
PSU	approx. -40 to +160 °C	1	2	3	1	-	Durable, high stability, good dielectric properties.
PTFE	approx. -200 to +260°C	1	1	1	1	1	Extremely temperature and chemical resistant, physiologically harmless, does not spontaneously combust, very low friction coefficient.
PVC	approx. -10 to + 60 °C	2	3	3	1	1	Good chemical resistance and mechanical ratings, soft PVC hardens in gasoline and oil, good welding and adhesion properties.
PVDF	approx. -40 to + 100 °C	1	1	1	1	1	Abrasion resistant, high chemical resistance.

1 = very good resistance, little or no effect (for thermoplastics moisture expansion < 3 % or loss in weight < 0.5 %)
2 = good resistance, low to moderate effect (for thermoplastics: moisture expansion 3 - 8 % or loss in weight 0.5 - 5 %)
3 = not resistant, strong effect to complete destruction (for thermoplastics: moisture expansion 3 - 8 % or loss in weight > 5 %)
= no data available
All values and descriptions are only approximate and are not binding in every application.
No guarantees can be made

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Characteristics of Plastic Materials

Raw materials group	Abbreviation according to DIN EN ISO 1043-1	Trade Name®	Mechanical properties				Temperature resistance	Thermostable DIN 53461 °C
			Density DIN 53479 g/cm³	Tensile strength DIN 53455 %	Fracture strain DIN 53455 %	Elastic modulus DIN 53457 N/mm²		
Acrylonitrile-butadiene styrene-copolymer	ABS	Cycolac	1,04	35	45	2100	-50 to +70	+97
Fabric reinforced laminate	HGW	HGW-2082	1,4	80		7000	to +110	
Polyamide	PA 6	Sustamid 6	1,14	80 tr/60 lf	>30 tr/200 lf	3000 tr/1500 lf	-40 to +100	+95
Polyamide	PA 6 GF 30	Sustamid 6 GF 30	1,35	180 tr/120 lf	>4 tr / >7 lf	9000 tr/7000 lf	-40 to +120	+220
Polyamide	PA 6 + MoS_2	Sustamid 6 + Mo	1,14	80 tr/60 lf	>30 tr/200 lf	3000 tr/1500 lf	-40 to +120	+100
Polyamide	PA 6 G + Oel	Sustamid 6 GOL	1,14	80 tr/60 lf	>30 tr/100 lf	3000 tr/1800 lf	-40 to +105	+95
Polyamide	PA 6 G	Sustamid 6	1,15	85 tr/60 lf	>20 tr/100 lf	3300 tr/2000 lf	-40 to +105	+95
Polycarbonate	PC	Sustonat|Makrolon	1,2	>60	>80	2300	-40 to +110	+138
Polycarbonate	PC GF 20	Sustonat GF 20	1,42	100	3,5	5900	-40 to +120	+147
Polyethylene	PE-HD	Finathene	0,95	30	1000	1000	-50 to +90	+70
Polyethylene	PE-HMW	RCH 500	0,95	28	600	1100	-200 to +80	+60
Polyethylene	PE-UHMW	RCH 1000	0,93	40	>350	680	-150 to +90	+65
Polyletheretherketone	PEEK	Sustatec PEEK	1,32	95	45	3650	to +250	+160
Polyletheretherketone	PEEK-GF30	Victrex	1,49	157	2,2	10300	-40 to +260	+340
Polyetheretherketone	PEEK-mod.	Victrex	1,48	118	3	10000	-40 to +260	
Polyetherimide	PEI	Sustatec PEI	1,27	105	60	3100	to +170	+20
Laminated paper	HP-2061	Pertinax	1,4	120		7000	to +120	
Polyethersulfone	PES	Sustatec PES	1,37	85	40	2500	to +200	+215
Thermoplastic polyester	PET	Sustanat bzw. Sustadur	1,38	90	>20	3000	-20 to +120	+80
Acyrlic glass	PMMA	Degalan	1,18	72	5	3300	-40 to +75	+95
Polyoxymethylene	POM	Sustarin	1,41	70	40	3100	-40 to +100	+124
Polypropylene	PP	Vestolen	0,91	36	>100	1350	+5 to +100	+88
Polypropylene	PP-R	Vestolen	0,9	40	800	700	-5 to +100	+75
Polyphenylene ether	PPE (PPO)	Sustatec PPE mod.	1,1	45	50	2400	-40 to +105	+100
Polystyrene	PS / SB	Vestyron	1,03	25	50	1900	-50 to +70	+89
Polysulfone	PSU	Sustatec PSU	1,24	75	>50	2800	-40 to +160	+175
Polytetrafluoroethylene	PTFE	Teflon	2,14-2,19	14-39	200-500	400-800	-200 to +260	+50
Polyvinyl chloride	PVC		1,42	58	15	3000	-10 to +60	
Polyvinyl chloride, chlorated	PVC-C		1,55	80	15	3000	-15 to +85	+102
Polyvinyl chloride, high impact resistant	PVC-HI		1,38	30	30	2600	-40 to +60	+69
Polyvinyl chloride, unplasticized	PVC-U		1,36	30	33	3000	-15 to +60	+72
Polyvinylidene fluoride	PVDF	Sustatec PVDF	1,78	55	>100	2100	-40 to +110	+115

The values shown in the table are approximate or average values which may vary based on different proccessing conditions, material additives and environmental influences. All values and descriptions reflect our current knowlege and are not binding in every application.
Adhesive capability rating system: + = yes, o = conditional, - = no

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Characteristics of Plastic Materials

Abbreviation according to DIN EN ISO 1043-1	Specific volume resistivity DIN 53482 Ohm x cm	Insulating strength DIN 54481 KV/mm	Moisture absorption at 50 % rel. LK	Adhesive capability	Characteristics	Fields of application
ABS	≥10^{14}	150	0,4	+	Hard, scratch resistant, impact resistant, high chemical resistance, can be used in electroplating	Textile coils, fittings, machine control panels, housing, eyeglass frames
HGW	n. DIN 53480-83	n. DIN 53480-83	n. DIN 53495	+	High mechanical stability, oil and leach resistant, good machinibility	Structural elements in machine construction, for example gear wheels
PA 6	10^{15} tr / 10^{12} lf	12	2,5 - 4,0	+	Durable, abrasion resistant, good vibration damping, good emergency running properties	Gear wheels, rollers, bearing bushings, sliding elements, dowels, buoyancy devices, fittings
PA 6 GF 30	10^{15} tr / 10^{12} lf	60 tr / 30 lf	2,0 - 2,5	+	High stability, rigidity, very abrasion resistant	Gear wheels, barrels, rollers, housing
PA 6 + MoS_2	10^{15} tr / 10^{12} lf	12	2,5 - 3,5	+	Very high wear resistance, high firmness and rigidity ratings, good emergency running properties	Gear wheels, rollers, bearing bushings, sliding elements
PA 6 G + Oel	10^{15} tr / 10^{12} lf	18	2,0 - 3,0	-	High abrasion resistance, low coefficient of sliding frictionl	Bearings, sliding elements
PA 6 G	10^{15} tr / 10^{12} lf	20	2,0 - 3,0	+	Hard, pressure and abrasion resistant, good antifrictional properties	Gear wheels, barrels, rollers
PC	>10^{16}	32	0,2	+	Durable, almost unbreakable, high-impact resistant, transparentt	Security glazing, protective hoods, covers, fan impellers, contact strips
PC GF 20	10^{16}	35	0,1	+	High stability, low thermal expansion	Safety helmets, covers, housing
PE-HD	>10^{15}	>70	0,01	-	Good mechanical stability, low density, good chemical resistance	Gear wheels, sliding elements, piping, fittings, handles, coils, containers
PE-HMW	10^{17}	90	0	-	Harder and more rigid, otherwise similar to PE-UHMW, no moisture absorption	Rails, sliding bearings, molded and rotating parts
PE-UHMW	>10^{14}	>70	0,01	-	High chemical resistance, very high tear resistance and tensile strength, almost unbreakable	Slideways, conveyor screws, pump components, chains, protective plates, molded and rotating parts, food processing
PEEK	4,9 x 10^{16}	22	0,2	+	Very good chemical, thermal and dielectric ratings	Molded and rotating parts, electrical insulation material
PEEK-GF30	≥10^{13}		0,11	+	Good mechanical properties	Molded and rotating parts
PEEK-mod.	≥10^{5}	24,5	0,1	o	Very good chemical, thermal ratings, good mechanical properties	Molded and rotating parts, housing
PEI	10^{17}	33		+	Thermostable, transparent, durable, good chemical resistance	Fan impellers, covers, housing
HP-2061	n. DIN 53480-83	n. DIN 53480-83	n. DIN 53495	+	Very rigid, very good dielectric properties, oil and leach resistant	Insulation material in low voltage devices
PES	>10^{17}	45	~0,7	+	Hard, rigid, tolerable to superheat sterilization, high thermostability	Gear elements, coil forms, medical technology
PET	10^{16}	20	0,2	+	Durable, hard, dimensionally stable, low cooling point, good chemical and electrical properties	Sliding elements, rails
PMMA	>10^{15}	30	0,3	+	Glass-clear, weather and UV resistant, hard surface	Covers, partitions, switch components, piping, displays
POM	10^{15}	>50	0,25	-	Good machinibility, abrasion resistant, dimensionally stable	Gear wheels, valve bodies, fittings, blade wheels, sliding elements, bearings
PP	>10^{16}	70	0,01	o	Good chemical resistance, shatterproof, low density, low moisture absorption	Ventilators, covers, housings, drainpipe fittings, food processor components
PP-R	>10^{16}	70	0,01	o	Higher tensile and ductile strength, otherwise similar to PP	Ventilators, heating ducts, armature
PPE (PPO)	10^{15}	35	0,08	o	High chemical resistance, low density	Containers, housing
PS / SB	>10^{16}	200	<0,1	+	Hard surface, good dielectric properties, coil forms	Packaging, sight glassesr
PSU	5 x 10^{16}	30	0,25	+	High stability, transparent, good dielectric properties	Covers, housing, terminal strips, medical technology
PTFE	10^{18}	40-80	0	o	Highest thermostability and chemical resistance, lowest friction coefficient, physiologically harmless	Sliding elements, chemical seals, armatures, electrical insulation
PVC	10^{15}	39	<0,1	+	Good dielectric properties, good chemical resistance	Containers, covers, housing, pipes, electrical insulation
PVC-C	>10^{15}	20-40	0,2	+	Higher tensile strength and temperature resistance, otherwise similar to PVC	Armatures, pumps, covers
PVC-HI	>10^{15}	20-40	0,2	+	Higher cold resistance and impact resistance, otherwise similar to PVC	Ventilation shafts, fans, covers, containers, pipes
PVC-U	>10^{15}	20-40	0,2	+	Higher fracture strain, otherwise similar to PVC	Covers, containers
PVDF	5 + 10^{14}	20,5	<0,04	o	Abrasion resistant, good dielectric properties, high density, good chemical resistance	Medical components, seals, pump components, covers, containers

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Conversion factors and tables

Pressure	Pa	Mpa	bar	kp/cm² (1 at)	atm	Torr (mm Hg)	mWs	PSI
1 Pa (=1 N/m²)	1	0,0000001 = 10^{-6}	0,000001 = 10^{-5}	0,0000102 = $1{,}02 \cdot 10^{-5}$	0,00000987 = $9{,}87 \cdot 10^{-5}$	0,00750	0,000102 = $1{,}02 \cdot 10^{-4}$	0,000145 = $1{,}45 \cdot 10^{-4}$
1 Mpa (=1 N/mm²)	0,000001 = 10^{-6}	1	10	10,20	9,87	7519	101,937	145
1 bar (1000 mbar)	0,000001 = 10^{-6}	0,10	1	1,02	0,987	751,90	10,197	14,20
1 kp/cm² (1 at)	98066,5	0,09806	0,98067	1	0,968	737,60	10	14,22
1 atm	101325	0,101325	1,01325	1,032	1	761,65	10,326	14,69
1 Torr (mm Hg)	133,32	0,0000133 = $1{,}33 \cdot 10^{-4}$	0,00133	0,00136	0,00132	1	0,0136	0,02
1 mWs	9806,7	0,009807	0,09807	0,1	0,0968	73,76	1	1,42
1 PSI	6896,6	0,006896	0,068966	0,07034	0,0681	51,85	0,7032	1

Lenghts	inch	foot (ft)	yard (yd)	mile	mm	cm	m	km
1 inch (in)	1	0,0833	0,02778	0,0000158 = $1{,}58 \cdot 10^{-5}$	25,4	2,54	0,0254	0,0000254 = $2{,}54 \cdot 10^{-5}$
1 foot (ft)	12	1	0,3333	0,0001894 = $1{,}89 \cdot 10^{-5}$	304,8	30,48	0,3048	0,0003048 = $3{,}05 \cdot 10^{-4}$
1 yard (yd)	36	3	1	0,0005683 = $5{,}68 \cdot 10^{-5}$	914,4	91,44	0,9144	0,0009144 = $9{,}14 \cdot 10^{-4}$
1 mile	63346	5278,78	1759,62	1	1609000	160900	1609	1,609
1 mm	0,03937	0,003281	0,0010936	0,0000006 = $6 \cdot 10^{-7}$	1	0,1	0,001	0,000001 = 10^{-6}
1 cm	0,3937	0,03281 = $6{,}2 \cdot 10^{-6}$	0,010936	0,0000062	10	1	0,01	0,000001 = 10^{-5}
1 m	39,37	3,281	1,094	0,00062 = $6{,}2 \cdot 10^{-4}$	1000	100	1	0,001
1 km	39370	3281	1094	0,6215	1000000	100000	1000	1

Face	inch² (sq in)	foot² (sq ft)	yard² (sq yd)	cm²	dm²	m²	hectare (ha)
1 inch (sq in)	1	0,006944	0,000772 = $7{,}72 \cdot 10^{-4}$	6,452	0,6452	0,000645	$6{,}45 \cdot 10^{-8}$
1 foot (sq ft)	143,98	1	0,1111	929	9,29	0,0929	$9{,}29 \cdot 10^{-6}$
1 Yard² (sq yd)	1296	9	1	8361	83,61	0,8361	$8{,}36 \cdot 10^{-5}$
1 cm²	0,155	0,001076	0,0001197 =$1{,}12 \cdot 10^{-4}$	1	0,01	0,0001 = 10^{-4}	0,00000008 = 10^{-8}
1 dm²	15,5	0,1076	0,01196	100	1	0,01	0,00001 = 10^{-6}
1 m²	1550	10,76	1,196	10000	100	1	0,0001 = 10^{-4}
1 hectare (ha)	1550031	107600	11960	100000000	1000000	10000	1

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Conversion factors and tables

Volume	inch³ (sq in)	foot³ (sq ft)	yard³ (sq yd)	cm³	dm³	m³
1 inch³ (sq in)	1	0,0005786 = 5,78 • 10 -4	0,0000214 = 2,14 • 10 -5	16,39	0,01639	0,0000164 = 1,64 • 10 -5
1 foot³ (sq ft)	1728	1	0,037	28316	28,32	0,0283
1 yard³ (sq yd)	46656	27	1	76456	764,56	0,7646
1 cm³	0,06102	0,0000353 = 3,53 • 10 -5	0,0000013 =1,3 • 10 -6	1	0,001	0,000001 = 10-6
1 dm³	61,02	0,03532	0,00131	1000	1	0,001
1 m³	61023	35,32	1,307	1000000	1000	1

Mass	dram (dr)	ounce (oz)	pound (lb)	gram (g)	kilogram (kg)	ton (t) (metric)
1 dram (dr)	1	0,0625	0,003906	1,772	0,00177	1,77 10-6
1 ounce (oz)	16	1	0,0625	28,35	0,02832	28,3 10-6
1 pound (lb)	256	16	1	453,6	0,4531 =4,53 • 10 -4	0,000453
1 gram (g)	0,5643	0,03527	0,002205	1	0,001	0,000001 =10 -6
1 kilogram (kg)	564,3	35,27	2,205	1000	1	0,001
1 ton (t) (metrisch)	564383	35270	2205	1000000	1000	1

Temperature	°C	°F	K
1°C (Grad Celsius)	1	33,8	274,15
1 °F (Grad Fahrenheit)	-17,222	1	255,928
1 K (Kelvin)	-272,15	-457,87	1

Time	sec (second)	min (minute)	h (hour)
1 s (Sekunde)	1	0,0166667	0,0002778
1 min (Minute)	60	1	0,0166667
1 h (Stunde)	3600	60	1

Energy	Nm (Joule)	kWh	kpm	kcal
1 Nm (Joule)	1	0,0000003 = 3 • 10 -7	0,1019	0,000238 = 2,38 • 10 -4
kWh	3600000	1	366972,5	359,2
1 kpm	9,81	0,0000027 = 2,7 • 10 -6	1	0,0234
1 kcal	4190	0,001164	427,1	1

Power	dram (dr)	ounce (oz)	pound (lb)	gram (g)	kilogram (kg)
1 W	1	0,001	0,001358	0,102	0,86
1 kW	1000	1	1,358	102	860
1 PS	736	0,736	1	75,075	632,96
1 kp m/s	9,8	0,0098	0,0133	1	8,43
1 kcal/h	1,163	0,01163	0,0158	0,1186	1

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Conversion factors and tables

Speed	M/s	Foot/sec	Mile/h	Km/h	Inch/min	Cm/min
1 m/s	1	3,281	2,237	3,6	2363	6000
1 foot/sec	0,305	1	0,682	1,097	720	1829
1 mile/h	0,447	1,467	1	1,609	1056	2682
1 km/h	0,278	0,911	0,621	1	656	1667
1 inch/min	0,00042	0,00138	0,00095	0,00152	1	2,54
1 cm/min	0,01666	0,00055	0,0004	0,0006	0,3937	1

Conversion inch to mm

Inch/Brake value	Inch/ Decimal value	metric mm
1/64	0,016	0,397
1/32	0,031	0,794
3/64	0,047	1,191
1/16	0,063	1,587
5/64	0,078	1,984
3/32	0,094	2,381
7/64	0,109	2,778
1/8	0,125	3,175
9/64	0,141	3,527
5/32	0,156	3,969
11/64	0,172	4,366
3/16	0,188	4,726
13/64	0,203	5,159
7/32	0,219	5,556
15/64	0,234	5,953
1/4	0,250	6,350
17/64	0,266	6,747
9/32	0,281	7,144
19/64	0,297	7,541
5/16	0,313	7,937
21/64	0,328	8,334
11/32	0,344	8,731
23/64	0,359	9,128
3/8	0,375	9,525
25/64	0,391	9,922
13/32	0,406	10,319
27/64	0,422	10,716
7/16	0,438	11,112
29/64	0,453	11,509
15/32	0,469	11,906
31/64	0,484	12,303
1/2	0,500	12,700

Inch/Brake value	Inch/ Decimal value	metric mm
33/64	0,516	13,097
17/32	0,531	13,494
35/64	0,547	13,890
9/16	0,563	14,287
37/64	0,578	14,684
19/32	0,594	15,081
39/64	0,609	15,478
5/8	0,625	15,875
41/64	0,641	16,272
21/32	0,656	16,669
43/64	0,672	17,066
11/16	0,688	17,462
45/64	0,703	17,859
23/32	0,719	18,256
47/64	0,734	18,653
3/4	0,750	19,050
49/64	0,766	19,477
25/32	0,781	19,844
51/64	0,797	20,241
13/16	0,813	20,638
53,64	0,828	21,034
27/32	0,844	21,431
55/64	0,859	21,828
7/8	0,875	22,225
57/64	0,891	22,622
29/32	0,906	23,018
59/64	0,922	23,416
15/16	0,938	23,812
61/64	0,953	24,209
31/32	0,969	24,606
63/64	0,984	25,003
1/1	1	25,400

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Material Properties

Physical properties								
Basic elastomer	Trademark	Hardness range (Shore) (+/- 5)	Tensile strength N/mm²	Rebound resilience at 20°C	Abrasion resistance	Resistance to permanent deformation (B)	Commitment to metal	Dielectric properties
Natural rubber (NR)	Crepe Sheets SMR 5 CV	40-90	4-15	++	++	++	++	++
Ethyl-ene-Propyl-ene-Diene Monomer (EPDM)	Keltan Vistalon Nordel Buna AP	40-90	6-13	+	+	+		++
Polychloro-pren (CR)	Baypren Neoprene	40-90	5-15	+	+	+	+	
Nitril rubber (NBR)	Perbunan N	45-90	4-14		+	+		-
Styrol-Butadiene-Rubber (SBR)	BUNA EM	45-90	4-15	+	++	+	++	+

General resistance against:									
Basic elastomer	Trademark	Chemical resistance (A)	Oil resistance (A)	Fuel resist-ance (A)	Solvent resistance (A)	Temperature Stability °C (C)	Ozone resistance	General weather resistance	Gas Impermea-bility
Natural rubber (NR)	Crepe Sheets SMR 5 CV	+	-	none	-	-40 to +80			
Ethyl-ene-Pro-pylene-Di-ene Monomer (EPDM)	Keltan Vistalon Nordel Buna AP	++	-	-		-40 to +120	++	++	
Polychlo-ropren (CR)	Baypren Neoprene	+	+	-	+	-25 to +100	++	++	+
Nitril rubber (NBR)	Perbunan N		++	+	+	-30 to +100		+	+
Styrol-Butadiene-Rubber (SBR)	BUNA EM	+	-	-	-	-30 to +80		+	

These indications are merely reference values and of purely character

A = In view of the multitude of chemicals, solvents, application temperatures and times, the value quoted may vary in some cases. For example, one type of elastomere which normally shows low resistance properties, might show a very good resist to certain media.
B = At relatively high, resp. low temperatures resistance generally drops.
C = These are borderline values which can vary depending on the composition of the mixture.
++ = excellent to very good
+ = good
= satisfactory to moderate
- = low to poor

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Material Properties

Thermal Behaviour							Physical Properties			
Basic elastomere	Trademark	Lowest application temperature ° C	Highest application temperature dry °C	water °C	oil °C	steam °C	Remaining deformation	Combustion behaviour	Weathering and ozoe resistance	Gluing properties
Natural rubber (NR)	Crepe Sheets SMR 5 CV	-40	+80	+70	-	-	++			++
Ethylene-Propylene-Diene Monomer (EPDM)	Keltan Vistalon Nordel Buna AP	-40	+120	+120	-	+120	+		++	
Polychloropren (CR)	Baypren Neoprene	-25	+100	-	-	-	+	+	+	++
Acryl-Nitrile-Butadien-Rubber (NBR)	Perbunan N	-30	+100	+80	+120	-	+			+
Styrol-Butadiene-Rubber (SBR)	BUNA EM	-30	+80	+70	-	-	+			+

Resistance to Fluid Media										
								Organic solutions		
Basic elastomer	Trademark	Water	Detergents	Acids	Lye solutions	Oils	Petrols	aliphatic hydrocarbons	aromatic hydrocarbons	Kebone
Natural rubber (NR)	Crepe Sheets SMR 5 CV	+	+			-	-	-	-	
Ethylene-Propylene-Diene Monomer (EPDM)	Keltan Vistalon Nordel Buna AP	++	+	+	+	-	-	-	-	+
Polychloropren (CR)	Baypren Neoprene	+	+	+	+				-	-
Acryl-Nitrile-Butadien-Rubber (NBR)	Perbunan N	+	+	+		+	+	+		-
Styrol-Butadiene-Rubber (SBR)	BUNA EM	+	+	+	+	-	-	-	-	

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List of resistance

Resistance list

Chemical Assesssment System

1 = very good resistance, space or no attack.
The medium has little orlimited effect on the material. Environmental changes such as temperature, concentration, etc, can change the resistance.

2 = Resistance good, light to moderate attack
The material has a satisfactory usability. The medium may cause a continuous negative influence on the hose material. It can also lead to discoloration. ambience changes such as temperature, concentration, etc., can the cange resistance.

3 = medium resistance to short-term contact with
the medium for long-term contact with the media, the destruction of the material.

4 = not resistant, strong attack to complete Destruction
A blank space indicates that no assessment has been made. Please ask for the relevant recommendation.

Notes:
- The values are test results and apply only as a guide. These figures allow for a pre-selection, but in vital or extreme cases, practical tests must be conducted.
- The values are based (where otherwise indicated) on saturated or concentrated solutions.
- The test is conducted at standard temperature at 20 ° C when not otherwise specified.
- If your specific case does not use this information pleas contact us
- If solvent with other chemicals or water be mixed, the compatibility of these solvent must also be examined.
- There is no rule of discoloration. if discoloration occur, we ask for information, we will be happy to make an application recommendation.
- Even the permeability must be reviewed. It may be some media in the gaseous state-material to affect although the medium in the liquid state is suitable.

Medium	Natural-rubber (NR)	Styrol-Butadiene-rubber (buna) (SBR)	Polyurethane rubber (AU,EU)	Ethylene-Propylene-rubber (EPM, PDM)	Chloroprene-rubber (Neopren) (CR)	Nitrile-rubber (NBR)	Methyl-silicone-rubber (Siloprene) (Q, MQ)	Hypalon® (CSM)	Viton® (FPM	Polyvinylchloride soft	Polyethylene (PE) (general)*	Polypropylene (PP)	Polyamide (Nylon usw.) (general) (PA)	Polyacetal (POM) (general) **	PTFE Teflon® usw.)	Polyurethan	Cross-linked-polyethylene-rubber
Acetaldehyde	2	2	2	3	3	3	1	3	2	-	1	1	1-2	2	1	2	1
Acetamide	3	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Acetone	3	3	-	1	3	-	2	2	-	3	1	1	1	1	1	-	-
Acetonitrile	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	1
Acetonphenone	3	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Acetylacetone	-	-	-	1	1	-	-		-	-	-	-		2	1	-	-
Acetylene gas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Acetic acid 10%	2	2	-	1	1	2	3	1	2	3	1	1	-	1	1	-	-
Acetic acid 25%	3	3	-	1	2	-	3	2	2	-	2	1	-	3 - -	1	-	-
Acetic acid 50%	-	-	-	2	3	-	3	2	2	-	3	2	-	3 - -	1	-	-
Acetic acid 100% (concentrate)	-	-	-	3	-	-	3	2	-	-	2	2	-	3 - -	1	-	-
Acetic acid ethylester: s. ethyl acetate																	
Acetic acid hydride 50%	2	2	-	1	3	3	1	1	-	-	3	1	1		1	-	-
Acetic acid alumina: s. aluminium acetate																	
Acid: see spec. Title generally	1-3	1-3	3	1-2	2-3	3	2	1-3	1	2-3	1-2	1-2	3	2-3	1	-	-
Acrolein	3	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Acrylonitrile	2	2	-	1	1	-	2	3	2	-	1	1	1	1	1	-	-
Acrylic acid, ethyl ester: s Ethyl acrylate																	
Adipic acid	1	1	-	1	1	1		1	1	1	1	1	1	2	1	-	-
Adipic acid diethyl ester	3	3		1	3	-		1	-	-				1	1	-	-
Air, atmospheric, oil-free to+°C	70	70	80	120	90	90	175	120	200	70	90	100	120	120	200	-	-
Air, oleiferous, until +°C	-	-	80	-	90	100	175	120	200	70	90	100	120	120	200	-	-
Alum: s potassium aluminium sulfate																	
Aliphatic: see benzene and homologous general	-	-	2	-	2-3	1	-	-	1	3	-	2	1	1	1	-	-
Alcohol	1	1	2	1	1	1	1-2	1	1-2	1-2	1-2	1-2	1-2	1-2	1	-	-
Ally chloride	-	-	-	-	-	-	1			-	-	2	1	-	1	-	-
Ally alcohole	1	1	-	1	-	1	-	-	-	20°C2	-	-	-	-	-	-	2
Aluminium acetate, hydrous	1	1		1	1	1	-	1		1	1	1	1	2	1	-	-
Aluminium chloride, hydrous	1	1	1-2	1	1	1	-	1	1	1	1	1	1	-	1	-	-
Aluminium fluoride	1	1	3	1	1	1	1	1	1	1	1	1	1	1-2	1	-	-
Aluminium hydroxide	1	1	2	1	1	1	1		1	1	1	1	1	1	1	-	-
Aluminium nitrate, hydrous	1			1	1	1	2	1		1	1	1	1	2-3	1	-	-
Aluminium phosphate, hydrous(phosphoric acid fused aluminia)	1	1		1	1	1	1	1	1	1	1	1		2-3	1	-	-
Aluminium sulphat, hydrous	1	1	1	1	1	1	1	2	1	1	1	1	1	3	1	-	-
Amine: specific terms																	
Ammonia gas 20 °C	1	1	-	1	1	1	1	2	1	1	1	1	1	1	1	-	-
Ammonia in water	1	1	-	1	1	1	1	3	1	1	1	1	1	1	1	-	-
Ammonia solution 40°C	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium carbonat, watery	1-2	1-2	-	1	1	2	2	1	1	1	1	1	2	1	1	-	-
Ammonium chloride, watery	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	-	-
Ammoniumdiphosphate, watery	1	1	1	1	1	1	1-2	1	1	1	1	1	1	2	1	-	-
Ammonium hydroxide, watery: s. ammonia in water																	
Ammoniummetaphosphate	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-

* Hard-(low pressure) polyethylene mostly stable as soft (high pressure) polyethylenes
** To distinguish between Homopolymerisat (Delrin®) and Copolymerisaten (eg Hostaform C®)
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List of resistance

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Ammonium nitrate, hydrous	1	1	1	1	1	1	2	1	1	1	1	1	1	1	-	-	-
Ammonium nitrite	1	1		1	1	1	2	1							1	-	-
Ammonium persulphate, hydrous	1	1	2	1	1	1	1	1		1	1	1	2	2	1	-	-
Ammonium phosphate, hydrous	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1		
Ammonium sulphate	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	-	-
Ammonium thiocyanate	1	1	2	1	1	1	1			1	1	1	1	1	1	-	-
Amyl acetate 1)	-	-	-	2	-	3	3	-	-	-	2	2	1	2	1	-	-
Amyl alcohol	1	1	2	1	1	1	1	2	1	1	1	1	1	1	1	-	-
Amyl borate	-	-		-	1	1		1	1						1	-	-
Amyl chloride	-	-	-	-	-	-	3			-	-	3	1	3	1	-	-
Aniline (amine benzene)	-	-	-	-	3	-	2	3	1-2	2	1	1	1-2	3	1	-	-
Aniline dyestuffs	3	3	-	2	3	-	2	3	1	1	3	1	1	1	1	-	-
Animal fat , oil , animal																	
Anol: s. cyclohexanole																	
Anon: s. cyclohexanone																	
Antichlor s. sodiumhisulfate (Natriumhiosulfat)																	
Antimony chloride 50%	1	1	2	1	1	3	-	1	1	1	1	1	-	1	1	-	-
Argon gas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Aromatic compounds: see benzene, toluene, xylol and homologous. generally essential	-	-	-	-	-	3 - -	-	3 - -	1-2	-	-	3	1	1-2	1	-	-
Arsenous acid (arsenic acid)	2	2	3	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Asphalt (bitumen)	-	-	2	-	2	2	2	2	1	2	1	1	1-2	1	1	-	-
Ate - break fluid	-	-	2	-	3	2	-	3	1	2	2	2	1	1	1	-	-
Barium chloride, hydrous	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	-	-
Barium hydroxide	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	-	-
Barium sulphate (Baryt)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Barium sulde	1	1	2	1	1	1	1	2	1	1	1	1	1	1	1	-	-
Beer	1	1	1	1	1-2	1	1	1	1	1	1	1	1	1	1	-	-
Benzoic aldehyde	3	3	3	2	-	-	3	-	2	3	-	1	1-2	2	1	-	-
Benzine, low aromatic	-	-	2	-	2-3	1	-	-	1	3	-	2	1	1	1	-	-
Benzine, high aromatic	-	-	2-3	-	3	1-2	-	-	1	3	-	2	1	1	1	-	-
Benzine, aircraft fuel	-	-	1-2	-	2-3	1	-	2	1	3	-	3	1	1	1	-	-
Benzine (premium fuel)	3	3	-	3	-	1	-	-	-	-	-	-	-	-	-	3	1
Benzine (max. 60% Benzene)	3	3	-	3	-	1	-	-	-	-	-	-	-	-	-	2	1
Benzoic acid , watery	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	-	-
Benzoic aldehyde	3	3	3	2	-	-	3	-	2	3	-	1	1-2	2	1	-	-
Benzene	-	-	-	-	-	3 - -	-	3 - -	1-2	-	-	3	1	1	1	-	-
Benzene alcohol	1-2	1-2	-	1	3	-	1	2	1	3	3	3	3	2	1	-	-
Benzyl benzoate	-	-		2	-	-			1					2	1	-	-
Benzyl chloride (2°-5°)	3	3	-	3	3	3	2	-	1	-	2-3	2-3	-	2-3	1	-	3
Bismuthcarbonate, (Wismutcarbo-nate)	1	1	1	1	1	1	1	1	1	1	1	1	1	1-2	1	-	-
Bisulfitlauf SO2-bearing	1	1		1		3			1	1	1	1		3	1	-	-
Biphenyl, polychlorinated: see Oils Transformer oil																	
Bismuth carbonate, (Wismutcar-bonate)	1	1	1	1	1	1	1	1	1	1	1	1	1	1-2	1	-	-
Bitumen 20°C (see hot bitumen)	-	-	2	-	3	2	3	3	1	-	1	1	1	1	1	-	-
Blancfix: see Bariumsulphate																	
Blubber code liver oil																	
Blue mountain (copperhydroxid)	1	1	1	1	1-2	-	1				1			1	1	-	-
Bore oil: chem. composition																	
Borax: s. sodium carbonate																	
Break fluid: s. fats and Oils																	
Bromine	-	-	-	-	-	3 - -	-	-	1						1	-	-
Bromenzol	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-
Butadiene	-	-	1-2	3	2	-		2	1	3	1	-		1	1	-	-
Butane gas	2	2	1	2	1	1	3	1	1	1	-	-	1	1	1	-	-
Butane watery	-	-	1	-	1	1	3	1	1	2	1	1	1	1	1	-	-
Butanole/s: butylalcohole																	
Butanone: s. Methyläthylketon																	
Butter *)	3	3	2	1	2	1	1	2	1	2	1	1	1	1	1	-	-
Buttermilke *)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Butanoic acid, watery 1)	-	-	-	2	3	2	2-3	3	1	-	1	1-2	1-2	1	-	-	
Butyl acetate	3	3	-	2	-	-	3	3	-	-	-	2	1	1	1	-	-

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List of resistance

Medium	Natural-rubber (NR)	Styrol-Butadiene-rubber (Buna) (SBR)	Polyurethane-rubber (AU, EU)	Eethylene-Propylene-rubber (EPDM, PDM)	Chloroprene-rubber (Neopren) (CR)	Nitrile-rubber (NBR)	Methyl-silicone-rubber (Siloprene) (Q, MQ)	Hypalon® (CSM)	Viton® (FPM	Polyvinyl chloride soft	Polyethylene (PE) (general)*	Polypropylene (PP)	Polyamide (Nylon etc.) (general) (PA)	Polyacetale (POM) (general) **	PTFE Teflon® etc.)	Polyurethan	Cross-linked-polyethylene-rubber
Butyl aldehyde	3	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Butyl alkohole	1	1	3	1	1	1	2	1	1	40°C1	-	1	1	1	1	3	1
Butyl amine	-	-	-	-	-	3	2	-	-					-	1	-	-
Butyl benzoate	-	-		1	-	-		-	1			2		2	1	-	-
Butyl carbitol				1	2	1		2	1						1	-	-
Butyl ether	-	-	3	3	2	1	3			1	1	1	1	1	1	-	-
Butylene, hydrous	3	3		2	3	2		3	1	1	-	-		1	1	-	-
Butyl oleate	1	1	3	1	3	1	2		1	-	1	1	1	1	1	-	-
Butyl stearate				2			-	1						1	1	-	-
Butyraldehyde	-	-	1	3	-	2	1		1	1	-	1	1	1	1	-	-
Calcium acetate	1	1		1	2	2		2	-		1				1	-	-
Calcium bisulphate, hydrous	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Calciumbisulphite	2	2	3	1	2	3	2	1	1	1	1	1	1	-	1	-	-
Calciumcarbonate	1	1	1	1	1	1	1		1	1	1	1	1	1-2	1	-	-
Calcium chloride, watery	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Calcium hydroxide, watery	1	1	3	1	1	2	2	1	1	1	1	1	1	1-2	1	-	-
Calcium hypochlorite, watery	2	2	-	1	-	1	3	2	1	1	1	1	-	3	1	-	-
Calcium nitrate	1	1	1	1	1	1	2	1	1	1	1	1			1	-	-
Calcium oxide	1	1	1	1	1	1	2	1	1	1	1	1		1	1	-	-
Calcium silicate	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1
Calcium sulfate, watery	1	1	1	1	1	1	1		1	1	1	1	1	1	1	-	-
Calcium sulfite	2	2	1	1	1	2	2	1	1						1	-	-
Carbitol: monoethyl ehter of diethylene glycol																	
Carbon dioxide, gas wet and dry	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Carbon disulphide	-	-	2	-	-	-	-	-	1	2	-	-	1	1	1	-	-
Carbon monoxide	2	2	1	3	2	1	2	1	1	1	1	1	1	1	1	-	-
Carbonic acid: see carbon dioxide																	
Carbon material tra chloride	-	-	3	-	-	3	-	-	1	-	-	-	1-2	1	1	-	-
Carbulic acid: s. phenol																	
Castor oil	1	1	1	2	1	1	1	1	1		2-3	1	1	1	1	-	-
Cellulose acetate	3	3	1	2	3	1	1				1	1	1	1	1	-	-
Chlor, dry	2	2	-	3	-	3	-	2	1	1	-	-	-	-	1	-	-
Chlor, wet	3	3	-	3	-	-	-	2	1	-	-	-	-	3	1		
Chlorethyl ethyldiloride/ chlorbenzene s. monochlorbenzene																	
Chlorbenzone (25 °C)	3	3	-	3	-	3	-	-	-	-	-	-	-	-	-	3	2
Chlor lead base: (vgl. Natriumhypochlorit) 13%	3	3	-	1	-	3	-	-	-	40°C1	-	-	-	-	-	2	2
Chlorbrommethane	-	-	3	3	-	-	-	-	1	-	-	-	1	3	1	-	-
Chlorbutadiene	-	-		-	-	-			1						1	-	-
Chlor calcium: s. Calciumchloride																	
Chlorine dioxide	-	-	-	3	-	-	3	1	1		-	-		-	1	-	-
Chlordflourmethan (25 °C)	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
Chlorinated diphenyl	-	-	-	-	-	-	2	-	1	-	1	1	1	1	1	-	-
Chloroacetic acid: s. Calcium hypochlorite																	
Chloroacetic acid (25 °C)	3	3	-	-	-	3	-	-	-	-	-	-	-	-	-	3	1
Chloridflourmethan (25 °C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorinated hydrocarbon	-	-	-	-	-	2-3											
Chloroform (Trichlormethan)	3	3	-	3	-	3	-	-	1	-	-	-	3	-	1	3	1
Chlorothene: s. Trichloraethane																	
Chlor acid, watery	-	-		2	-	-		1	-	1	1	1	-	-	1	-	-
Chlorsulfonic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Chlorine water 3%	3	3	3	3	2	3	2	3	2	1	2	2	-	-	1	-	-
Chromic acid 10%	-	-	3	2	-	-	3	2	1	1	1	1	3	2-3	1	-	-
Chromic acid 25%	-	-	-	2	-	-	-	2	1	2	1	1	-	-	1	-	-
Chromic acid 50%	-	-	-	2	-	-	-	2	1	-	3	1	-	-	1	-	-
Chromium trioxide s. chromic acid																	
Citric acid, hydrous [1)]	1-2	1-2	1	1	1	1	1	1	1	1	1	1	1-2	2	1	-	-
Citygas, Coalgas (Naturalgas)	3	3	3	3	3	2	3	3	1	1	1	1	1	1	1	-	-
Coal Tar	-	-	-	-	3	2	1	-	1	2	2	2	1	1	1	-	-
Coconut - fat and oil	-	-	1	1	2	1	1	2	1	1	-	-	1	1	1	-	-
Code liver oil (oil) [1)]	-		1	1	2	1	2	2	1	-	1	1	1	1	1	-	-
Copper cynide	1	1	2	1	1	1	1	1	1		1	1	1	1	1	-	-
Copper hydroxide	1	1	1	1	1-2	-	1				1			1	1	-	-
Copper nitrate. hydrous	1	1	3	1	1	1	1	1	1	3	1	3	1	1	1	-	-

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Fluor silicon acid: see pebble hydrofluoric acid / hydrogen fluoride (acid) : see hydro fluoric acid																	
Formaldehyde	2	2	2	2	2	2	1	1-2	1	2	1	1	1-2	1	1	-	-
Formaldehyde solution	2	1	-	1	-	2	-	-	-	40°C1	-	-	-	-	-	2	1
Formalin (30-40% Formaldehyde solution with 8-12% Methyl alcohol	1	1	2	1	1	2	2	2	1	1	1	1	1	1	1	-	-
Formic acid	1	1	-	1	1	2	2	1	3	3	2	1	-	2	1	-	-
Freone und Frigene: detailed application consulting demand																	
Fruit juices[1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Fruity pulp [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Fruit wines, fermented [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Furfural	1	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Furfurol	1	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Furfuryl alcohol (Furfurol)	2	2	-	2	2	-	2	2-3	3	1	-	-	1	2	1	-	-
Gallic acid	3	3	3	2	-	-	1	2	1	1	1	1		-	1	-	-
Gasoline: see Benzene																	
Gelantine, hydrous [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Glauber's salt: see sodium sulphate																	
Glucose [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Glue, animal	2	2	2	3	1	1	1	1	1	1	1	1	1	1	1	-	-
Glycerin	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	-	-
Glycerol: see pure ethylene glycol																	
Glycol: determine the exact description. generally	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Helium	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Heptan	-	-	2	-	2	1	-	2	1	1	1	2	1	1	1	-	-
Hexaldehyde	3	3	3	2	2	-	3				1	1		2	1	-	-
Hexahydrobenzol: see Cyclohexane / Hexane: see Cyclohexanol																	
Hexane	-	-	2	-	1	1	-	1	1	1	1	3	1	1	1	-	-
Hexanol = Hexyl alcohol	1	1	-	1	2	1	3	1	1	3	1	1	1	1	1	-	-
Heyl alcohol	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	3	1
Hot bitumen to °C	-	-	-	-	-	120	-	-	180	-	-	-	90	90	120	-	-
Hot air: see air																	
Hot tar to °C	-	-	-	-	-	100	-	-	180	-	-	-	90	90	200	-	-
Hydraulic oils and liquids																	
Hydrazine	2	2	-	1	2	2	-	2	-	1	1	1		1-2	1	-	-
Hydrazine hydrate	-	-	-	1	3	3	3	1	1	1	1	1		1	1	-	-
Hydrocynic acid 20%	2	2	2	1	3	3	2	2	2	1	1	1		2	1	-	-
Hydrocyanic acid 98% (conc.)	3	3	2	2	3	3	2	2	2	1	1	1		3	1	-	-
Hydrocloric acid 15%	1	1	2	1	3	2	1	1-2	1	1	1	1	-	-	1	-	-
Hydrochloric acid 38% (conc.)	2	2	-	1	3	3	3	1-2	1	2	1	1	-	-	1	-	-
Hydrochloric gas	1	1	2	1	3	2	1	1-2	1	1	1	1	-	-	1	-	-
Hydrofluoric acid (75%)	2	2	-	1	-	3	-	-	-	20°C2	-	-	-	-	-	2	1
Hydrofluoric acid 10%	3	3	2	-	-	3	1	1	1-2	2	2	1	-	-	1	-	-
Hydrofluoric acid 30%	-	-	2	-	-	-	1	1-2	1-2	-	2	1	-	-	1	-	-
Hydrofluoric acid 75%	-	-	3	-	-	-	1-2	1-2	1-2	-	-	1	-	-	1	-	-
Hydrogen(gas)	2	2	1	1	1	1	3	1	1	1	1	1	1	1	1	-	-
10% hydrogen peroxide	3	3	2	2	-	3	1	1	1-2	1	2	1	-	1	1	-	-
30% hydrogen peroxide	-	2	2	-	-	1	1-2	1	-	1	1	-	1	1	-	-	-
Hydrogen sulphide, moist	-	3 - -	2	3	3	1	1	1	-	1	1	1	-	1			
Hydrogen sulpjide, dry	3	3	3	2	3	2	1	1-2	1	-	1	1	1	-	1	-	-
I-cresole (60%)	3	3	-	-	-	3	-	-	-	20°C2	-	-	-	-	-	3	3
Iodine tincture (5-10% alk. iodo form.)	2	2	-	2	-	2	-	2	1	-	3	2	-	-	1	-	-
Iron sulfate, green vitriol, hydrous	1	1	2	1	1	1	1	1	1	1	1	1	2-3	1	1	-	-
Isobutanol = Isobutyl alcohol	1-2	1-2	-	1	1	2	1	1	1	1	1	1	1	1	1	-	-
Isobutyl acetate	3	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Iso octane	-	-	2	-	2	1	1	2	1	1	-	1	1		1	-	-
Iso octanol = Isoctyl alcohol	1	1	3	2	1	2	2	2	1	1	1	1		1	1	-	-
Isophoron	-	-	-	1	-	-	-	-	-					2	1	-	-
Isopropanol = Isopropyl alcohol	1	1	3	1	1	2	1	1	1	3	1	1	1	1	1	2	1
Isopropyl acetate	3	3	3	2	-	-	2	-	-	2		3	1	1	1	-	-
Isopropyl ether	-	-	2	3	3	3		3	3	3	3	3	1	1	1	-	-
Isopropyl benzol	-	-	3 - -	-	-	-	-	-	1						1	-	-
Isopropyl chloride	-	-		-		-			1						1	-	-

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Medium	Natural rubber (NR)	Styrol-Butadiene-rubber (Buna) (SBR)	Polyurethane-rubber (AU,EU)	Eethylene-Propylene-rubber (EPM, PDM)	Chloroprene-rubber (Neopren) (CR)	Nitrile-rubber (NBR)	Methyl-silicone-rubber (Siloprene) (Q, MQ)	Hypalon® (CSM)	Viton® (FPM)	Polyvinylchloride soft	Polyethylene (PE) (general)*	Polypropylene (PP)	Polyamide (Nylon etc.) (general) (PA))	Polyacetale (POM) (general) **	PTFE Teflon® etc.)	Polyurethan	Cross-linked-polyethylene-rubber
Fluor silicon acid: see pebble hydrofluoric acid / hydrogen fluoride (acid) : see hydro fluoric acid																	
Formaldehyde	2	2	2	2	2	2	1	1-2	1	2	1	1	1-2	1	1	-	-
Formaldehyde solution	2	1	-	1	-	2	-	-	-	40°C1	-	-	-	-	-	2	1
Formalin (30-40% Formaldehyde solution with 8-12% Methyl alcohol	1	1	2	1	1	2	2	2	1	1	1	1	1	1	1	-	-
Formic acid	1	1	-	1	1	2	2	1	3	3	2	1	-	2	1	-	-
Freone und Frigene: detailed application consulting demand																	
Fruit juices[1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Fruity pulp [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Fruit wines, fermented [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Furfural	1	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Furfurol	1	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Furfuryl alcohol (Furfurol)	2	2	-	2	2	-	2	2-3	3	1	-	-	1	2	1	-	-
Gallic acid	3	3	3	2	-	-	1	2	1	1	1	1		-	1	-	-
Gasoline: see Benzene																	
Gelantine, hydrous [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Glauber's salt: see sodium sulphate																	
Glucose [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Glue, animal	2	2	2	3	1	1	1	1	1	1	1	1	1	1	1	-	-
Glycerin	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	-	-
Glycerol: see pure ethylene glycol																	
Glycol: determine the exact description. generally	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Helium	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Heptan	-	-	2	-	2	1	-	2	1	1	1	2	1	1	1	-	-
Hexaldehyde	3	3	3	2	2	-	3				1	1		2	1	-	-
Hexahydrobenzol: see Cyclohexane / Hexane: see Cyclohexanol																	
Hexane	-	-	2	-	1	1	-	1	1	1	1	3	1	1	1	-	-
Hexanol = Hexyl alcohol	1	1	-	1	2	1	3	1	1	3	1	1	1	1	1	-	-
Heyl alcohol	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	3	1
Hot bitumen to °C	-	-	-	-	-	120	-	-	180	-	-	-	90	90	120	-	-
Hot air: see air																	
Hot tar to °C	-	-	-	-	-	100	-	-	180	-	-	-	90	90	200	-	-
Hydraulic oils and liquids																	
Hydrazine	2	2	-	1	2	2	-	2	-	1	1	1		1-2	1	-	-
Hydrazine hydrate	-	-	-	1	3	3	3	1	1	1	1	1		1	1	-	-
Hydrocynic acid 20%	2	2	2	1	3	3	2	2	2	1	1	1		2	1	-	-
Hydrocyanic acid 98% (conc.)	3	3	2	2	3	3	2	2	2	1	1	1		3	1	-	-
Hydrocloric acid 15%	1	1	2	1	3	2	1	1-2	1	1	1	1	-	-	1	-	-
Hydrochloric acid 38% (conc.)	2	2	-	1	3	3	3	1-2	1	2	1	1	-	-	1	-	-
Hydrochloric gas	1	1	2	1	3	2	1	1-2	1	1	1	1	-	-	1	-	-
Hydrofluoric acid (75%)	2	2	-	1	-	3	-	-	-	20°C2	-	-	-	-	-	2	1
Hydrofluoric acid 10%	3	3	2	-	-	3	1	1	1-2	2	2	1	-	-	1	-	-
Hydrofluoric acid 30%	-	-	2	-	-	-	1	1-2	1-2	-	2	1	-	-	1	-	-
Hydrofluoric acid 75%	-	-	3	-	-	-	1-2	1-2	1-2	-	-	1	-	-	1	-	-
Hydrogen(gas)	2	2	1	1	1	1	3	1	1	1	1	1	1	1	1	-	-
10% hydrogen peroxide	3	3	2	2	-	3	1	1	1-2	1	2	1	-	1	1	-	-
30% hydrogen peroxide	-	2	2	-	-	1	1-2	1	-	1	1	-	1	1	-	-	-
Hydrogen sulphide, moist	-	3 - -	2	3	3	1	1	1	-	1	1	1	-	1			
Hydrogen sulpjide, dry	3	3	3	2	3	2	1	1-2	1	-	1	1	1	-	1	-	-
I-cresole (60%)	3	3	-	-	-	3	-	-	-	20°C2	-	-	-	-	-	3	3
Iodine tincture (5-10% alk. iodo form.)	2	2	-	2	-	2	-	2	1	-	3	2	-	-	1	-	-
Iron sulfate, green vitriol, hydrous	1	1	2	1	1	1	1	1	1	1	1	1	2-3	1	1	-	-
Isobutanol = Isobutyl alcohol	1-2	1-2	-	1	1	2	1	1	1	1	1	1	1	1	1	-	-
Isobutyl acetate	3	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Iso octane	-	-	2	-	2	1	1	2	1	1	-	1	1		1	-	-
Iso octanol = Isoctyl alcohol	1	1	3	2	1	2	2	2	1	1	1	1		1	1	-	-
Isophoron	-	-	-	1	-	-	-	-	-					2	1	-	-
Isopropanol = Isopropyl alcohol	1	1	3	1	1	2	1	1	1	3	1	1	1	1	1	2	1
Isopropyl acetate	3	3	3	2	-	-	2	-	-	2		3	1	1	1	-	-
Isopropyl ether	-	-	2	3	3	3		3	3	3	3	3	1	1	1	-	-
Isopropyl benzol	-	-	3 - -	-	-	-	-	-	1						1	-	-
Isopropyl chloride	-	-		-		-			1						1	-	-

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List of resistance

Medium	Natural rubber (NR)	Styrol-Butadiene-rubber (Buna) (SBR)	Polyurethane-rubber (AU,EU)	Eethylene-Propylene-rubber (EPM, PDM)	Chloroprene-rubber (Neopren) (CR)	Nitrile-rubber (NBR)	Methyl-silicone-rubber (Siloprene) (Q, MQ)	Hypalon® (CSM)	Viton® (FPM)	Polyvinylchloride soft	Polyethylene (PE) (general)*	Polypropylene (PP)	Polyamide (Nylon etc.) (general) (PA)	Polyacetale (POM) (general) **	PTFE Teflon® etc.)	Polyurethan	Cross-linked-polyethylene-rubber
Kerosene (Kerosene)	-	-	2	-	3	2	3	2-3	1	1	-	-	1	1	1	-	-
Ketone: see indvidual names generally speaking	3 - -	3 - -	2	2	-	-	2	-	-	-	-	-	1-2	1-2	1	-	-
King's water	-	-	-	3	-	2	3	2	2	2	-	-	-	-	1	-	-
Lack gasoline: see Benzene																	
Lanolin	-	-	1	3	2	1	3	3	1	2	2	3	1	1	1	-	-
Laughing gas	1	1	1	1	1	1	1	1		1	1	1	1	1	1	-	-
Lauryl alcohol: See Dodecylalcohol																	
Lead acetate, hydrous	1	1	1	1	1	1	1			1	1	1	1-2		1	-	-
Lead arsenate, hydrous	1	1	1	1	1	1	1			1	1	1	1	1	1	-	-
Lead nitrate	1	1		1	1	1	2	1							1	-	-
Lead arsenate	1	1	1	1	1	1	1			1	1	1		1	1	-	-
Liquid ammonia	2	2	-	1	2	1-2	3	2	-	3	1	1	1	1	1	-	-
Linseed oil [1]	-	-	2	2	2	1	1	1-2	1	3	-	1	1	1	1	-	-
LPG: see corresponding chemical name of the gas																	
Magnesium chloride, hydrous	1	1	1	1	1	1	1	1-2	1	1	1	1	1	1	1	-	-
Magnesium hydroxide	2	2	1	1	1	2		1	1						1	-	-
Magnesium solution	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	1	1
Magnesium silicate (Talk)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Magnesium sulphate	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	-	-
Magnesium sulphite, hydrous	1	1	1	1	1	1	1	1	1	1	1	1		-	1	-	-
Maleic acid, hydrous	3	3	-	3	-	-		-	1	1	1	1		3	1	-	-
Malic acid, watery [1]	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Margarine-Fats and Oils [1]	3	3	1	3	2	1	3	1-2	1	2	2-3	2-3	1-2	1	1	-	-
Mash [1]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Mercury	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	-	-
Mercury chloride (Sublimate)	1	1	1	1	2	3	1	1-2	1	3	1	1	-	1	1	-	-
Mercury nitrate	1	1	1	1	1	1	1			1	1	1	1	1	1	-	-
Mercury salts	1	1	-	1	-	1	-	-	-	40°C1	-	-	-	-	-	-	1
Mesityl oxide	-	-		2	-	-	-	-	-						1	-	-
Methane (gas)	-	-	3	3	3	1	3	3	1	1	1	1	1	1	1	-	-
Methanol: see Methyl alcohol																	
Methyl acrylate	-	-	-	2	-	-	-	-	-	-	1	1	1	2	1	-	-
Methyl ethyl ketone (MEK)	3	3	-	-	-	3	-	-	-	-	-	-	-	-	-	-	1
Methyl alcohol	1	1	3	1	1	1	1	1	1-2	0°C1	1	1	1-2	1	1	2	1
Methyl amine, hydrous	1	1		1	1	-		1	1	3	1	1	1	1	1	-	-
Methyl chloride	3	3	-	2	-	-	-	-	3	3	-	2	1	-	1	-	-
Methylene chloride: see Dichloromethane																	
Methylglycol (Methylcellosolve)	-	-		2	2			2	-	-	1	1	1	2	1	-	-
Methylclykolacetate	-	-	-	2		-	-		-			1	1	2	1	-	-
Methylisobutylketone	-	-	-	3	-	-	3	-	-		1		1	2	1	-	-
Methylphthalate: see Dimethylphthalate																	
Milk [1]	1	1	2	2	1	1	1	-	1	1	1	1	1	1	1	-	-
Mineral oil: see oil, mineral																	
- minerals without additives in 20°C	-	-	1	-	2-3	1	2-3	2-3	1	2	2	2	1	1	1	-	-
- mineral without additives to °C	-	-	60	-	-	120	-	150	200	-	30	40	100	100	200	-	-
- ASTM-Oil No. 1 20 °C	-	-	1	-	1	1	2	1	1	2	2	2	1	1	1	-	-
- ASTM-Oil No. 2 20 °C	-	-	2	-	2	1	3	2	2	2	3	3	1	1	1	-	-
- ASTM-Oil-No. 31 20 °C	-	-	2	-	2	1	3	2	2	2	3	3	1	1	1	-	-
- animal (animal) [1]	-	-	1	2	2	1	3	1-2	1	2	2-3	2-3	1-2	1	1	-	-
- vegetable (vegetable) [1]	3	3	1	3	2	1	3	1-2	1	2	2-3	2-3	1-2	1	-	-	
Molasses [1]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Monochloro benzene	-	-	3	-	-	-	3	-	2	-	-	1	1	1	1	-	-
Monochlorine acetic acid	-	-	-	2	-	-	-	2	-	-	-	1	-	-	1	-	-
Monochlormethane: see Methylchloride																	
Monostori tyrol: see Styrene, monomer																	
Most, unfermented [1]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Most, fermanted: see fruit wine																	
Motor: see oil and fats, mineral suppliments clarify																	
Myristylalcohol = Myristinalcohol				1	1	1		1	1	1				1	1	-	-
Naphtha (petroleum)	-	-	2	-	-	1	2	3	1	3	-	1	1	1	1	-	-
Naphthalene: see mineral																	

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Natural gas, wet	3	3	1-2	3	1	1	-	1	1	1	2	1	1	1	1	-	-
Natural gas, dry	1	1	1	1	1	1	-	1	1	1	1	1	1	1	1	-	-
Nickel sulphate, hydrous	1	1	2	1	1	1	1	1	1	1	1	1	1-2	1	1	-	-
Nitrate	1	1	1	1	1	1	1	1	1	-	1	1	1	1	1	1	1
Nitric acid 10%	3	3	-	1	3	3	3	1-2	1-2	1	1	1	-	-	1	-	-
Nitric acid 25%	-	-	-	1	-	-	-	1-2	1-2	1	1	1	-	-	1	-	-
Nitric acid 40%	-	-	-	2	-	-	-	1-2	1-2	2	-	-	-	-	1	-	-
Nitric acid 60%	-	-	-	3	-	-	-	1-2	1-2	3	-	-	-	-	1	-	-
Nitrideacid (mixtures of nitric acid and conc. sulphuric acid, see this)																	
Nitro benzene	3	3	-	-	-	-	-	-	2	-	-	1	1-2	2-3	1	-	-
Nitro propane	-	-	-	2	-	-	-	-	-				1	2-3	1	-	-
Nitro toluene	-	-	-	3	-	3		-	3	-	1			2-3	1	-	-
Nony alcohol (Nonanol)	-	-	-	1	1	-	2	2	1		1		1	1	1	-	-
Octane	-	-	1	-	3	1	-	-	1		1		1	1	1	-	-
Octanol = Octyl alcohol	2	2	-	1	1	2	2	1	1	-	1	1	1	1	1	-	-
Olein(acid): see Oelic acid																	
Oleic acid	-	-	1	-	3	2	-	-	2	1	2	3	1	1-2	1	-	-
Oleum (fuming sulphuric acid)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-
Oleum vapours	-	-	-	3	-	-	-	3	3	3	-	-	-	-	1	-	-
Olive oil [1)]	-	-	1	3	1	1	2	1-2	1	1	1	1	1	1	1	-	-
Oxalic acid, hydrous	2	2	-	2	2	2	1	2	1	2	1	1	1-2	2	1	-	-
Ozone	-	-	1	1	3	-	1	1	1	1	-	-	3	-	1	-	-
Palm oil [1)]	-	-	2	1	2	1	1	3	1	3	-	-	1	1	1	-	-
Palmitic acid	3	3	1	3	2	3	1	2-3	2	-	1	1	1	2	1	-	-
Paraffin, Paraffin oil	-	-	2	3	2	1	2	3	1	1	3	1	1	1	1	-	-
Para formaldehyde	3	3	1	2	2	2	1		2		1	1	1-2	1	1	-	-
Pebble flour water agent acid , hydrous	1	1	-	2	3	2	-	2	-	1	1	1	3	-	1	-	-
Pebble flour water agent acid,(50%)	3	1	-	1	-	3	-	-	-	-	-	-	-	-	-	-	1
Penta chloro phenole	-	-	-	2	-	-	3					1		-	1	-	-
Pentane	-	-	-	-	1	1	-			1	-		1	1	1	-	-
Perborate: see sodiumborate																	
Perchloro ethylene	-	-	-	-	-	2-3	2	-	1	-	-	-	1-2	1	1	-	-
Perchloric acid, hydrous	2	2	-	2	3	3	-	1	1	1	1	1	-	-	1	-	-
Perhydrole: see hydrogen peroxide																	
Permanganate: see potassium permanganate																	
Petrol(eum)	-	-	1	-	2	1	2	3	1	-	2-3	2-3	1-2	1	1	-	-
Petroleum (Naphtaline)	-	-	2	-	-	1	3	2-3	1	1	-	-	1	1	1	-	-
Petrol ether: see petrol																	
Petroleum based	-	-	1	-	2	1	3	2	1	3	3	2	1	1	1	-	-
-Glycol	-	1-2	1	2	1	2						1	1	1	1	-	-
-Phosphat ester based	-	-	-	2	-	-	2-3	-	1	-	-	3	1		1	-	-
Phenol (Carbolic acid), hydrous	3	3	-	1	3	-	2	3	1	-	-	1	-	3	1	-	-
Phosphoroxide chloride	-	-		1	-	-		1	1	-	3	3		-	1	-	-
Phosphoric acid 50%	1	1	2	1	1	2	2	1	1	1	1	1	-	-	1	-	-
Phosphoric acid 85%	1	1	-	1	1	3	3	1-2	1	1	1	1	-	-	1	-	-
Phosphoric acid clay: see Aluminium phosphate																	
Phtal acid anhydride, hydrous (Phtal acid)	1	1		1	1	-		1	-	1	1	1	3	2	1	-	-
Pikric acid	3	3	-	1	3	3	1	2	1-2	1	1	1	1	-	1	-	-
Pine oil [1)]	-	-	1	-	-	2	2	-	1	2	2-3	2-3	1-2	1	1	-	-
Polychlorinated Biphenyl (Pyranole): see Oils, Transformer oil																	
Potash: see potassium carbonate																	
Potassium: see potassium hydroxide / potassium nitrater: potassium nitrate																	
Potassium acetate, hydrous	-	-	-	1	2	2	-	-	-	1	1	1		1	1	-	-
Potassium aluminium sulphate (alum)	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	-	-
Potassium bicarbonate	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Potassium bichromate: see potassium																	
Potassium borate, hydrous	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Pb (10%)	1	1	-	1	-	1	-	-	-	40°C1	-	-	-	-	-	-	1
Potassium bromide, hydrous	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Potassium carbonate (Potash)	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	-	-

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Medium	Natural rubber (NR)	Styrol-Butadiene-rubber (Buna) (SBR)	Polyurethane-rubber (AU,EU)	Eethylene-Propylene-rubber (EPM, PDM)	Chloroprene-rubber (Neopren) (CR)	Nitrile-rubber (NBR)	Methyl-silicone-rubber (Siloprene) (Q, MQ)	Hypalon® (CSM)	Viton® (FPM)	Polyvinylchloride soft	Polyethylene (PE) (general)*	Polypropylene (PP)	Polyamide (Nylon usw.) (general) (PA)	Polyacetale (POM) (general) **	PTFE Teflon® etc.)	Polyurethan	Cross-linked-polyethylene-rubber
Potasium chlorate, hydrous	1	1	2	1	1	1	2	1	1	1	1	1	1	-	1	-	-
Potassium chloride	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Potassium (Cyan kali)	1	1	3	1	1	1	1	1	2	-	1	1	1	1	1	-	-
Potassium dichromate	3	3	2	1	3	2	1	1-2	1	1	1	1	2-3	1	1	-	-
Potassium hydroxide (caustic potash, potassiumlauge)	1	1	1	1	1	1	3	1-2	1	1	1	1	1	1-2	1	-	-
Potassium hypochlorite (water)	2	2	-	2	-	2	2	-	1	1	3	3	-		1	-	-
Potassium iodide hydrous	3	3		1	1	1		1	1	3	1	1	-	1	1	-	-
Potassium nitrate, hydrous	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Potassium permanganate 10% watery	3	3	1	1	3	2	1	1	1	1	1	1	-	1	1	-	-
Potassium phosphate (moni u.dibasisch)	1	1	1	1	2	1	-	1	1		1	1	1	1	1	-	-
Potassium sulphate	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Potassium sulphite	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	-	-
Propane, liquid	-	-	1	-	2	1	3	3	1	1	-	1	1-2	1	1	-	-
Propane gas	1	1	1	1	1	1	-	2-3	1	1	2	2	1	1	1	-	-
Propanol: see Propyl alcohol																	
Propionic acid	-	-		1	-	-		3	1	1	1	1		-	1	-	-
Propionic acid ethylester	1	3	-	1	-	3	-	-	-	40°C1	-	-	-	-	-	-	1
Propylacetate	-	-		1	1	-		-	-		2	2		1	1	-	-
Propylalcohol	1	1	3	1	1	2	2	2	1	3	1	1	1	1	1	-	-
Propylamine	-	-	-	-	-	-	-	-	-			1		1-2	1	-	-
Propylene (Propene)	-	-	-	-	-	-	-	-	1			1		1	1	-	-
Propylene dichloride				-	-	-	-				-	-	1-2	-	1	-	-
Propylene glycol	1	1		1	1	3	1	1	1	3	1	1	-	1	1	-	-
Propylene oxide	-	-	-	2	-	-	-	-	-			1	-	2	1	-	-
Pure oxygen to+°C	-	-	80	120	90	-	175	120	200	70	70	70	90	10	200	-	-
Pydraul: see Hydraulic fluids for phosphate ester base/ pyranole: see oils/ transformer oil																	
Pyridine	-	-	-	1	-	-	-	3	3	-	1	3	1	1	1	-	-
Radiation, radioactive	-	-	3	2	-	-	-	-	-	-	3	3	-	-	-	-	-
Raps (seeds oil) [1)]	-	2	1	2	2	-	2	1						1			
Raw juice [1)]	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Red wines and know [1)]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Salicylic acid, hydrous	1	1		1	1	1-2		1	1		1	1	1	3	1	-	-
Salmiak: see Ammonium chloride / ammonia solution: see Ammonia in Water																	
Salt: salt, see sodium chloride																	
Salt water: see Solution see Water, sea water																	
Sangajol = Terpentine oil salts: see Benzene																	
Sebum	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Separating water see Nitric acid																	
Silver salts	-	2	-	1	-	1	-	-	-	40°C1	-	-	-	-	-	1	1
Silicon oils -fat	1	1	1	1	1	1	2	1	1	-	1	1	1	1	1	-	-
Silicon dioxide	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Slurry	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Soap solution	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium acetate, hydrous	1	1	3	1	1	1	1		1	1	1	1	1	1	1	-	-
Sodium bicarbonate, hydrous	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium bisulphate	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium bisulphite, hydrous	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium borate (Borax)	2	2	1	1	1	2	2	2	1	1	1	1	1	1	1	-	-
Sodiium carbonate	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium chlorate, hydrous	1	1	2	1	1	1	1	1	1	1	1	1	1	-	1	-	-
Sodium chloride (salt)	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium cyanide	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium dichromate	2-3	3	1	2	3	2	1	1		1	1		1	1		-	-
Sodium fluoral aluminate 10%	1	1	2-3	1	1	1	2		1	1	1	1		1	1	-	-
Sodium fluoride	1	1	2	1	1	1	2		1	1	1	1	1	1	1	-	-
Sodiium hydroxide (caustic soda, caustic soda) 25%, 20°C	1	1	2	1	1	2	2	1	3	1	1	1	1-2	1	1	-	-
Sodium hydroxide5 (caustic soda, causic soda) 25%, 100°C	-	-	-	2	3	-	-	3	-	-	-	2	2-3	-	1	-	-
Sodium hypochlorite 10%	2	2	2	1	3	1	1	1	1	1	1	1	-	2-3	1	-	-
Sodium hypochlorite30%	3	3	3	1	-	2	3	1	2-3	1	2	1	-	2-3	1	-	-

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List of resistance

Medium	Natural rubber (NR)	Styrol-Butadiene-rubber (Buna((SBR) (SBR)	Polyurethane-rubber (AU,EU)	Ethylene-Propylene-rubber (EPM, PDM)	Chloroprene-rubber (Neopren) (CR)	Nitrile-rubber (NBR)	Methyl-silicone-rubber (Siloprene) (Q, MQ)	Hypalon® (CSM)	Viton® (FPM	Polyvinyl chloride soft	Polyäthylene (PE) (general)*	Polypropylene (PP)	Polyamide (Nylon etc..) (general) (PA)	Polyacetale (POM) (general) **	PTFE Teflon® etc.)	Polyurethan	Cross-linked-polyethylene-rubber
Sodium metaphosphate	1	1		1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium nitrate	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium nitrite	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	-	-
Sodium perborate	1	1	1	1	1	1	1	1	1	2	1	1	1	3	1	-	-
Sodium peroxide	2	2	3	2	3	2	-	2	2			1	1	1	1	-	-
Sodium phosphate (See also Trisodium phosphate addition)	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium silicate, hydrous	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium sulphate,hydrous	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	-	-
Sodium sulphide, hydrous	3	3		1	-	1		1	-	1	1	1	1	1	1	-	-
Sodium sulphite, hydrous	1	1	1	1	1	1	1	1	1	1	1	1	1	2-3	1	-	-
Sodiumthiosulphate (Anti-chlorine)	1	1	2	1	1	1	1	1	1	1	1	1	1	-	1	-	-
Sole (saline solution)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Soy bean oil	-	-	2	3	2	1	1	2	1	1	-	1	1	1	1	-	-
Sublimate: Quick silver chloride																	
Sugar	1	-	-	1	-	1	-	-	-	40°C1	-	-	-	-	-	1	1
Sugar, hydrous[1]) (Sugarcane juice, see these)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Sulphur, melting, 90°C	-	-	2	-	-	-	1	1	1	-	-	-	1	1	1	-	-
Sulphuric ether: see ether / Sulphur: see sulphurous acids																	
Sulphur dioxide (60%)	3	2	-	1	-	3	-	-	-	60°C1	-	-	-	-	-	2	1
Sulphuric acid 10%	1	1	2	1	1	1	2	1	1	1	1	1	-	1-2	1	-	-
Sulphuric acid 30%	2	2	1	2	2	-	1	1	1	1	1	-	-	1			
Sulphuric acid 50%	3	3	2	1	3	3	-	1	1	1	1	1	-	-	1	-	-
Sulphuric acid 75%	-	-	-	2	-	-	-	1-2	1	3	3	1	-	-	1	-	-
Sulphuric acid 90%	-	-	-	3	-	-	-	2	1	-	-	1	-	-	1	-	-
Sulphuric acid conc. (Oleum, smoking pages)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-
Sulpuric acid anhydride	-	-	-	2	-	3	-	-	-	-	-	-	-	-	-	3	3
Sulphur choride	-	2	-	2	-	3	-	-	-	-	-	-	-	-	-	3	1
Sulphur trioxide	2	2	2	2	-	3	3	2-3	1	1	1	1	-	-	1	-	-
Sulphurous acid 10%, moist	3	3	2	1	3	3	1	1-2	2	2	1	1	-	-	1	-	-
Sulphurous acid 75%. moist	-	-	-	2	-	-	3	2-3	2	-	3	3	-	-	1	-	-
Starch,hydrous[1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Starchsyrup [1])	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Stearin (acid)	2	2	1	2	2	2	1	2-3	2	1	-	-	1	1	1	-	-
Styrol, monomer	-	3	-	-	-	-	-	2	-	-	-	1	1	1	-	-	-
Tannic acid (Tannin)	2	2	3	2	2	2	2	1-2	1-2	1	1	1	1	3	1	-	-
Tar	-	-	-	-	3	2	2	-	1	2	2	2	1	1	1	-	-
Tartaric acid, hydrous[1])	1	1	1	2	1	1	1	1	1	1	1	1	3	3	1	-	-
Terpentine oil	-	-	-	-	-	1	-	-	1	3	3	-	1	2	1	-	-
Tetrachloro ethane	3	3	-	3	-	3	-	-	-	-	-	-	-	-	-	-	1
Tetrachlorine carbon	-	-	3	-	-	3	-	-	1	-	-	-	1-2	1	1	-	-
Tetrachlorine hydrocarbon	3	3	-	3	-	3	-	-	-	-	-	-	-	-	-	2	3
Tetrahydrofuran	-	-		-	-	3		-	-	-	3	-	1	1-2	1	-	-
Tetralin = Tetrahydronaphtalin	-	-		-	-	3	-	-	1	1	3	-	1	1	1	-	-
Tin-II-Chloride, hydrous	1	1	1	2	1	1	2	1	1	1	1	1	3	-	1	-	-
Toluene	-	-	-	-	-	3	-	-	1	-	-	-	1	1	1	-	-
Transformers-Oils (Pyranole)	-	-	2	-	-	1	2	-	1	3	3	-	1	1	1	-	-
- Silicon based	1	1	1	1	1	1	-	1	1	1	1	1	1	1	1	-	-
- Diesel	-	-	2	-	2-3	1	3	3	1	3	2	3	1-2	1	1	-	-
- Oil	-	-	2	-	2	1	3	3	1	3	2	3	1-2	1	1	-	-
- Hydraulic oil on																	
- Mineral base	-	-	2	-	2	1	3	1-2	1	3	3	2	1	1	1	-	-
- Glycol (polyalkylglycol)	-	-	1-2	1	2	1	2	2	3		1	1	1	1	1	-	-
- Phosphate ester base	-	-	-	2	-	-	2-3	-	1	-	-	3	1		1	-	-
Triäthylamine				-		3					1			1-2	1	-	-
Tributylphosphate	-	-	-	1	-	-		-	-	-	1			2	1	-	-
Trichlorine ethene	-	-	-	-	-	-	-	-	1		-	2	1	-	1	-	-
Trichlorine ethylene	-	-	-	-	-	3	-	-	1-2	-	-	2	1-2	2-3	1	-	-
Trichloridemethane: Chloroform																	
Tricresylphosphate	1	1	-	1	3	-	1	-	2	-	3	3	2	1	1	-	-
Triethanol amine	3	3	-	3	1	2	1	3	1	-	1	1	1	1	1	-	-

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Triethyl amine	3	-	-	3	-	1	-	-	-	-	-	-	-	-	-	-	1
Trimethyl amine	3	-	-	3	-	1	-	-	-	-	-	-	-	-	-	-	1
Trisodium phosphate	1	1	3	1	1	1	1	1		1	1	1	1	1	1	-	-
Trioctyl phosphate	-	-		-	-	2	3	-	-	-	1	1		2	1	-	-
Unfermented	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Urine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Vinegar, (fare vinegar) [1)]	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1	-	-
Vinyl acetate	1	1		1	1	1		1	1	-			1	2	1	-	-
Vinyl chloride, monomer	2	2	-	2	-	-	-		1	-	-		1	-	1	-	-
Vitriol: s. coppersulphate / Vitriolöl: s. Oleum																	
Weathering	-	-	1	1	1-2	-	1	1	1	1	2	2	2	2	1	-	-
Water																	
- drinking water or mineral water, without additives[1)] to °C	70	70	60	120	70	110	120	100	150	70	80	90	100	100	200	-	-
- destilled, demineralised, desalinate, condensation: polymer does not , but polymer influenced water																	
- mineral water CO2 saturated [1)]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-
- king water: see																	
- seawasser	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-
Water vapour to °C	-	-	-	130	-	100	120	100	150	-	-	-	120	120	200	-	-
Water glass: see sodium silicate																	
Weathering	-	-	1	1	1-2	-	1	1	1	1	2	2	2	2	1	-	-
White Spirit: see Benzene																	
Wool: see Lanolin																	
Xylenol	-	-	-	-	-	3- -	-	-	1-2	-	-	3	1	1	1	-	-
Xylene	-	-	-	-	-	3- -	-	-	1-2	-	-	3	1	1	1	-	-
Zinc acetate, hydrous [1)]	-	-	-	1	2	2	-	-	-		1	1		1	1	-	-
Zinc chloride, hydrous [1)]	1	1	3	1	1	1	1	1	1-2	1	1	1	2-3	1	1	-	-
Zinc sulphate, hydrous	1	1	3	1	1	1	1	1	1	1	1	1	2-3	1	1	-	-

* Hard-(low pressure) polyethylene mostly stable as soft (high pressure) polyethylenes
** To distinguish between Homopolymerisat (Delrin®) and Copolymerisaten (eg Hostaform C®)
1) If food quality is needed please ask us fur a quotation

All values and descriptions can only be indicative and are not for every case of application authentic.
Any warranty is excluded

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Summary of important norms

DIN 3771	O-rings
DIN 7168	General tolerances (Free tolerences)
DIN 7715 (Teil 1-5) ISO 3302	Rubber parts permissible degree deviation
DIN 7716 ISO 5285	Rubber products Guidelines for storage, maintanence and cleaning
DIN EN 10204 DIN 50049	Rypes of examination
DIN EN ISO 10431	Plastics designation
DIN 11851 DIN 11864; 1-2	Fittings for food and chemicals, Pharmacy
DIN 16091	Plastic mouldings; tolerence and acceptance conditions for length dimensions
DIN 52613	Technical trials thermal protection provisions of thermal conductivity with the disk device
DIN 53421 ISO 844	Attempt to pressure hard foams
DIN 53423 ISO/R 1209	Bending to hard foams
DIN 53427 ISO 1922	Provision of heavy resistance from hardcore foams between metal plates
DIN 53428	Examination of the behaviour of liquids, vapours, Gases and solid of foams
DIN 53443	Shock attempt; attempt tp bolt case plastics
DIN 53445	Consideration of polymeric materials, torsional vibration test
DIN 53447	Consideration of plastics Tori determine the stiffness of sion (clash- berg)
DIN 53448	Blow tensile test in plastics
DIN 53452	Consideration of plastics, Bending
DIN 53453 ISO 1407	Consideration of plastics Blow tensile test in plastics
DIN 53454 ISO/R 604	Consideration of plastics Pressure test
DIN 53455	Consideration of plastics Tensile
DIN 53457	Consideration of plastics Determining the elasticity module in Train-,printing- and Elasticity limit test
DIN 53476 ISO 175	Determining the behaviour against Fluid of plastics
DIN 53479 ISO/R 1183	Consideration of plastics and Elastomers Determining the density
DIN 53482	Consideration of insulated substances Determining the electrical resistance values
DIN EN ISO 62	Determination of water absorption after storage in cold water of plastics
DIN 53504 ISO 37	Consideration of elastomers Tensile
DIN 53505 ISO 868	Consideration of vulcanised and synthetic rubber Hardness testing according to shore A and D
DIN 53507 ISO 34	Considerations of elastomers Tear growth test with the sample strips
DIN 53508 ISO 188	Consideration of elastomers Artificial ageing of soft rubber
DIN 53509 T2 ISO 1431	Consideration of vulcanized and natural rubber Accelerated ageing of rubber under the influence of ozone Statistic loads of samples
DIN 53512 ISO 4662	Consideration of elastomers Determination of shock elasticity
DIN 53515 ISO 34	Consideration of rubber and elastomers and plastic films Tear growth test angle with the sample Graves to break with
DIN 53516 ISO 4649	Consideration of rubber and elastomers Wear attempt to determine the abrasion
DIN 53517 ISO 815	Consideration of elastomers Determining the hardness of ball pressure Soft rubber International hardness
DIn 53524 ISO 1817	Consideration of vulcanised and synthetic rubber Determining the behavior of liquids, gases and vapors (source behaviour)
DIN 53522 ISO 132/133	Consideration of elastomers and rubber; Duration knucle attempt
DIN 53533	Consideration of elastomers; Examination of the heat education and abrasion resistance in fatigue test
DIN 53536 ISO 1399	Provison of gas permeability in elastomers
DIN 53538	Consideration of elastomers; Standard Reference Elastomers Determining the behaviour of petroleum products to nitrile rubber vulcanizates
DIN 53545	Consideration of elastomers; classification des Verhaltensbei Determination of low temperatures (cold behaviour), words, signs and tests
DIn 53546	Consideration of elastomers; classification der low-temperature brittleness in determining the impact stress VDMA-tank unit
VDMA 24317	VDMA-tank unitr oil hydraulic plants del lamb bare heavy pressure fluids guidelines
DIN-VDE 0302	Insulation of electrical equipments
DIN-VDE 0303	VDE-Regulations for electrical testing of insulator

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Summary of important norms

DIN 2825 EN ISO 6134	Hose lines from elastomers for steam and hot water
DIN 2826 EN ISO 14423	Hose fittings with clamp mount for steam and hot water DN 15 to DN 50 to 18 bar
DIN 2827	Hoses assemblies of stainless steel for chemical substances
DIN 2828 DIN EN 14420-7	Lever arm clutch for PN 10 hoses
DIN EN ISO 9001: 2000	Quality Management-System
DIN 20018	Hoses with fabric insert
DIN 20066 Part 4	Fluid technology, hoselines, installation
DIN 28450	Tanker clutches nominal pressure 10, sizes 50, 80 und 100
EN 10204	Metal products; Types of examination
EN12115	Hoses for liquid or gaseous chemicals
EN 559 DIN 8541	Rubber hoses for welding, Cutting and related procedures
BS 5842: 1980	Specification for thermal plastic tubing and fittings with uses in ports and road and rail tankers (british standard)
EN 1761	Rubber tubing and hoses
DIN EN 14420	Hose fittings and clamp versions
Part 1	Requirements, overview, description and verification
Part 2	Tubular sided hydrants parts, sizes and designs
Part 3	Klemm versions, or bolted verstiftet
Part 4	Flang econnections
Part 5	Threaded connectors
Part 6	Tanker couplings
Part 7	Lever arm clutcher (see above)
Part 8	Balanced couplings (Guillemin)
Part 9	Lessons for tanker couplings
Part 10	Lessons for lever arm clutching
Part 11	Lessons for symmetrical couplings (Guillemin)
EN ISO 8330	Rubber and plastics tubing and hose Vocabulary

pH-values

The pH (potentia hydrogen= hydrogen concentration) is used to, acids and alkalis to be distinguished from one another and to identify strenghts. Because everything was water, also has a pH value of using electric measuring instruments or so called indicators such as Litmus detected. The sacale ranges from pH 0 to pH 14, while the average pH of 7 is considered neutral.

	strong			weak			neutral	weak			strong			
ph-value:	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
	Acids							**neutral dilution**	**Bases**						
	e.g. sulphuric acid, hydrochloric acid				e.g. Carbonic acid, acetic acid			e.g. pure water, blood	e.g. soapsuds			e.g. caustic potash solution, caustic soda solution, Ammonia			

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1. Exclusive Applicability and Recognition of our Standard Terms and Conditions of Sale

1.1 All offers made by us shall be subject to our Standard Terms and Conditions of Sale. We only accept orders on the aforesaid Standard Terms and Conditions. General terms and conditions of the Buyer and ancillary agreements which deviate from our Standard Terms and Conditions of Sale shall only be binding if we have expressly recognised them in writing.
The following terms and conditions shall apply exclusively for the sale of all products in our production and distribution range. The aforesaid terms and conditions govern all legal relationships concerning the sale unless otherwise agreed in writing. Terms and conditions of business contrary to our terms and conditions must be expressly confirmed by us in writing in order to be valid.

1.2 With the order placement and acceptance of deliveries, the Buyer recognises the applicability of our Terms and Conditions of Sale not only for the business transaction in question, but also for all future business transactions.

2. Offers, Orders and Deliveries

2.1 Offers: Our offers are subject to change without notice. Documents forming part of the offer such as illustrations and drawings, etc., shall only be regarded as precise as far as dimensions and weights are concerned if this has been expressly confirmed in writing. We shall reserve the proprietary right and copyright to such documents. They may not be made available to third parties without our consent. They are to be returned to us immediately if no order is placed.

2.2 In cases of doubt, our written order acknowldgement shall be exclusively authoritative for the details of the contract.

2.3 In case of make and hold orders in which the bulk order contract does not specify any fixed buying period, the complete bulk order quantity has to be bought within 2 years.

2.4 We shall reserve the right to refuse orders without providing reasons or to deliver on a c.o.d. basis.

3. Telephonic Orders

Telephonic orders shalle be immediately confirmed by the Customer in writing. We shall ssume no liability for the correctness of deliveries based on telephonic orders.

4. Scope of the Delivery Obligation

Our written order acknowledgement based on the order shall apply for the scope, type and date of delivery. Over- or under-deliveries of up to 10% of the ordered quantity shall not be rejected by the Customer. Part-deliveries shall be permitted. Unless otherwise agreed in the contract, the Customer must forward a delivery allocation schedule to us at least 4 weeks prior to the agreed delivery date.

5. Dispatch

Unless we receive special dispatch instructions, we shall ship goods by the most economical dispatch route at our discretion. Goods shall be dispatched for the account and at the risk of the Buyer even if we execute the transport function with our own vehicles or if we bear or prepay the transport costs.

6. Delivery Date

We shall make every effort tro comply with agreed delivery dates. If we are, however, prevented from complying with such delivery dates as a result of unforeseeable circumstances which we could not avert despite reasonable care based on the circumstances of the individual case, e.g. labour disputes, commotion, actions by the authorities, production stoppages, delays with the delivery of major raw materials and supplies, the delivery period shall be reasonably extended without it being possible for claims to be made against us as a result of the above.
If the aforesaid circumstances occur at the Customer's, the same legal consequences shall apply for his acceptance obligation.

7. Prices

The prices in force on the date of delivery shall apply unless otherwise agreed. Freight, packaging, insurance, customs duty and other expenses, including expenses for the payment of documents required for the importation of goods into the country of destination shall be borne by the Buyer.
All prices are stated exclusive fo value-added tax.

8. Payment

8.1 We shall issue an invoice as soon as the ordered goods are ready for despatch or collection. Despatch delays or delays in the collection of goods which are not attributable to us shall not postpone the due date of the relevant invoice.

8.2 Our invoices are payable within one week with 2% cash discount or within 30 days net, in both cases with effect from the invoice date.

8.3 Deviations shall only be accepted with a written confirmation.

8.4 Bills of exchange are not accepted by us as a means of payment. Cheques are only accepted by us as conitional payment.

8.5 If we accept cheques or bills of exchange, this shall always be done as conditional payments but not as settlements. In such cases, we are not responsible for due presentation or protesting. Discount, taxation and collection costs shall be for the account of the Buyer. The Buyer shall reimburse the aforesaid amount ot us immediately upon rquest. If the Buyer defaults with the payment of the purchase price, interest shall be charged on the relevant debt at a rate equivalent to 8% above the discount rate of the ECB. We shall reserve the right to make deliveries on a c.o.d. basis.
Tooling costs shall be payable net upon submission of the reference sample.

9. Reservation of Title

We shall retain our title to the delivered goods as long as claims arising from the business connection with the Buyer have not been settled in full. In the event of adaptation or processing of goods delivered by us, any acquisition of title by the shall be excluded. Adaptation or processing work shall be carried out for us in such that we are to be regarded as manufacturer. If the delivered goods are processe other good from another source which are also subject to a reservation of title exte to processing of the said goods, we shall acquire co-ownership in the new chattel ratio of the invoice value of our goods compared with the value of the other goods time of processing.
All claims of the Buyer arising from a resale of goods in which we have a title or shall pass to us upon the conclusion of the sale contract, regardless whether the are sold without or with adaptation or processing, combination or interminglin regardless of whether they are sold to one or several buyers. If the sold goods belong to us in full or if they are sold together with goods not belonging to u assignment shall only include the counterclaim in the amount of the invoice value goods.
If the Buyer is in default in whole or in part with the settlement of a liablity secured reservation of title, or if we become aware of circumstances which indicate that our could be endangered, we shall be entitled to demand a return of the goods delive us without declaring the prior withdrawal from the sale contract in accordance with of the German Civil Code (BGB) or without having set a period of grace for the settl fo payment obligations in accordance with §223 BGB. The validity of the sale cc and the obligations of the Buyer shall remain unaffected by the aforesaid request a the return of the goods in question.
At the request of the Buyer, we shall, at out choice, be obliged to release securi which we are entitled on the basis of the above rulings (goods and claims) if their exceeds the claims to be secured by more than 20 percent.

10. Tools Dies and Production Equipment

Pressing and injection moulds, or any other moulds and tools which are produced or by any other party on our behalf shall basically remain our property in view of the performance.
If no subsequent order is received within 2 years of the execution of the last order, no subsequent order is anticipated, we shall be entitled to dispose of the tools, any other equipment at our discretion.

11. Warranty

We shall assume the following warranty to the Buyer:
11.1 We guarantee a lack of defects in the materials and workmanship in line w latest state of the artfor a period of 12 months with effect from the date of delivery goods to the Buyer.
In case of a justified notice of defects - the reference samples released by the Bu writing determining the expected quality and execution - the supplier is compe remedy.
The supplier has the right either to eliminate the defect or to deliver a good without
If the supplier does not not comply with this obligation within due time or if the atte remedy fails repeatedly, the Buyer has the right to diminish the buying price or to from the contract. Further claims, mainly claims of compensation for expenses or of damage compensation due to defect or resulting from a defect, arise if and or damage to life, body or health is attributed. The liability without fault according to tl relative to "Liability for Defective Products" remains unaffected. The liability for the contravention against major contract obligations remains unaffected, too. Howev liability remains restricted, except for cases mentioned in §1, to the foreseeable, contract-related damage. A change of burden of proof at the expense of the Bu implied by the aforesaid regulations.

11.2 If we expressly recognize a warranty case, the costs of the cheapest form of tra shall be for our account. Basically, no additional costs are assumed on account of tl that the goods were taken outside the Federal Republic of Germany.

11.3 Additional claims shall be excluded.

11.4 All warranty claims shall lapse in the event of improper handling, storage, return not sent in their original packaging and processing with unsuitable materials.

11.5 If rubber profiles are delivered, the guidelines specified in DIN 7716 shall apply storage, servicing and cleaning of goods. We shall assume no liability for damages c by non-compliance with the aforesaid regulation.

11.6 The current DIN standards for thermoplastics and elastomers shall apply f dimensions of the cross-section and lengths.

11.7 Warranty claims shall only be taken into account if they are immediately notified tc writing after a defect has been established.

11.8 We shall assume no liability for the ordered goods being suitable for the intended pu of the Buyer. Such an examination shall be the responsibility of the Buyer. We sh be liable for errors attributable to documents which were incorrectly submitted.

12. Other provisions

12.1 Place of performance and legal venue
The place of performance for deliveries or services to be performed is the domicile delivery plant in question.
The legal venue is Aschaffenburg.

12.2 Applicable law
The statutory regulations of the Federal Republic of Germany shall irrevocably unless otherwise agreed.

12.3 Partial invalidity
If one of the provisions included in these Terms and Conditions or connected with ar in any other way are invalid, the validity of the other provisions shall remain in ful and effect. The invalid provision shall be replaced by a valid provision which con close as possible to the original intention of the invalid provision.

13. Data Processing Authority

We shall be entitled to process all data relating to the Buyer protected by law with scope of the relevant legal regulations.