

APSOseal®

Elastomer Profiles



Elastomer profiles – everything you need from a single supplier

Elastomer profiles are employed as sealing, covering and protective elements. Compression of a cross-section, a hollow space or a lip initiates a sealing sequence. This shape change and the elastic behavior of the profile material create a seal. The natural resilience of elastomeric materials provides a virtually constant sealing force.



Consulting and engineering

The specialists at Angst + Pfister have extensive experience in the area of elastomer profiles. Take advantage of our expertise by turning to us for skilled, professional advice. We will help you select the ideal sealing material, and together with you we will examine the fabrication possibilities and define the cross-section contour. Ensuring seal reliability is the top priority. It goes without saying that we do everything we can to always provide the best economic solution.



Dependable logistics and quality management

It takes a comprehensive logistics infrastructure to be able to supply the right products at the right time. Our logistics center functions fully automatically with electronic order tracking. Our international presence enables us to provide our customers with just-in-time delivery whenever and wherever they need it. And our ISO 9001:2000-certified complete quality assurance system enables you to greatly simplify your incoming goods inspection procedure. In addition, Angst+ Pfister makes an important contribution to trouble-free production processes as well as end-product reliability and safety for you as our customer.



Standard assortment of elastomer profiles, sealing tapes and adhesive tapes

Angst + Pfister stocks an extensive standard assortment of elastomer profiles, sealing tapes and adhesive tapes. Items in this standard product range can be used for a vast array of applications.

Further information is available on our website at www.angst-pfister.com. Elastomer profiles can also be ordered through Angst + Pfister's APSOparts® online shop at www.angst-pfister.com/shop.

Customized solutions with elastomer profiles

If your application requires a non-standard profile, our specialists will be glad to advise you. In all matters regarding material selection, design, fabrication, labeling and surface treatment, Angst + Pfister possesses a variety of production possibilities and the corresponding know-how to devise and implement for you an ideal solution perfectly tailored to your needs.

Materials and compliance certifications

Angst + Pfister supplies all common elastomer compounds. Many of the elastomer compounds in the Angst + Pfister assortment additionally feature compliance certifications for applications in areas such as the food-and-beverage industry, the medical sector and the rail vehicle construction industry.



Profile shapes and tolerances

To meet customer demands placed on extruded profiles, the profile geometry must be defined in a way that also takes manufacturing tolerances into account.



Fabrication

Angst + Pfister offers a full range of fabrication possibilities for elastomer profiles. One of Angst + Pfister's specialties in the area of elastomer profiles is customized AIRMATIC® sealing systems.



Profile labeling and surface treatment

Elastomer profiles can be inscribed with identification data (product designation, production date, etc.). Angst + Pfister offers a variety of different types of surface treatments for elastomer profiles.



Materials and compliance certifications



Requirements placed on elastomers

Each elastomer material has deployment constraints with regard to its behavior during exposure to hot and cold temperatures, its resistance to substances with which it comes in contact and its resistance to weathering. Depending on the deployment, our elastomer profile seals feature approval and compliance certifications for use in areas such as the food and medical industry (FDA, etc.) and the drinking-water sector (KTW, etc.), or meet fire protection regulations for the rail vehicle construction industry (e.g. DIN 5510, part 2). These regulatory requirements often also apply to applications employing non-black rubber (medical sector). In principle, every elastomer material can be dyed with a color additive, though that can have an adverse effect on the physical and mechanical properties, except in the case of silicone.

Selecting the base material

Media resistance and temperature resistance are the main deployment parameters taken into account when selecting the ideal base material. Other deployment parameters such as pressure and type of installation influence the choice of profile geometry. For most applications, standard materials are deployable. Specially formulated materials can also be supplied for specific deployments, but please note that these require mandatory minimum order quantities. For application-specific recommendations and information on other materials (such as thermoplastics), please contact our Sealing Technology specialists.

| Material designation | Chemical designation | Density [g/cm ³] | Hardness Shore A | Temperature [°C] | Low-temperature flexibility | Wear resistance | Resistance to weathering | Mineral oil (+100°C) | Acid 25% H ₂ SO ₄ (+50°C) | Alkali 25% NaOH (+50°C) | Water (+100°C) | Deformation resistance ① |
|----------------------|---------------------------------------|------------------------------|------------------|------------------|-----------------------------|-----------------|--------------------------|----------------------|---|-------------------------|----------------|--------------------------|
| NR/SBR | Natural rubber | 1.01–1.41 | 30–90 | -200 to +400 | B | B | - | - | C | B | C | C |
| SBR | Styrene butadiene elastomer | 1.20 | 35–95 | -200 to +400 | B | B | - | - | C | B | C | C |
| IIR | Butyl elastomer | 1.35 | 30–80 | -200 to +400 | B | C | B | - | A | A | B | B |
| EPDM | Ethylene-propylene-diene elastomer | 1.02–1.17 | 30–90 | -200 to +400 | B | B | A | - | B | B | A | B |
| CR | Chloroprene elastomer | 1.31–1.52 | 40–90 | -200 to +400 | B | B | B | B | B | B | B | C |
| NBR | Acrylonitrile-butadiene elastomer | 1.18–1.55 | 30–95 | -200 to +400 | B | B | C | B | B | C | B | B |
| HNBR | Hydrogenated nitrile butadiene rubber | 1.40 | 30–95 | -200 to +400 | B | B | B | A | B | C | B | B |
| VMQ | Silicone elastomer | 1.15–1.30 | 30–85 | -200 to +400 | A | C | A | B | C | - | B | A |
| FVMQ | Fluorosilicone elastomer | 1.45 | 30–75 | -200 to +400 | A | B | A | B | C | - | B | A |
| FKM | Fluorinated elastomer | 2.00 | 65–90 | -200 to +400 | C | B | A | A | B | B | B | A |

Operating temperature
 Short-term operating temperature

① Resistance against permanent deformation at high temperatures
 A high | B medium | C low | - no information



Examples of applications

Left: Boiler housing with lip profile seal
 Right: Glass retention profile on sliding doors for the sliding door and window hardware industry

Profile shapes and tolerances



Profile shapes

During the manufacturing of extruded elastomer profiles, significant dimensional deviations arise caused by swelling of the profile cross-section as it exits the extrusion die and by shrinkage and deformation during subsequent vulcanization. Hence, the design of the seal geometry is the absolutely crucial determinant of seal functionality. Selecting the ideal profile shape takes a lot of experience, and the development work is very time-consuming. Shorten the development phase by taking advantage of our longstanding experience and comprehensive expertise.



Tolerances

To enable you to factor in dimensional deviations caused by fabrication, the profile dimensions are categorized in tolerance classes in accordance with DIN ISO 3302-1. A distinction is made between the following tolerance classes:

Class E1/L1

- Finest tolerances (e.g. ± 0.4 mm in cross-section for nominal size of 8 mm).
- For profiles that must meet the strictest dimensional accuracy specifications.

Class E2/L2 (standard, sufficient for most applications)

- Medium tolerances (e.g. ± 0.7 mm in cross-section for nominal size of 8 mm).
- For profiles with conventional dimensional accuracy specifications.

Class E3/L3

- Coarse tolerances (e.g. ± 1.0 mm in cross-section for nominal size of 8 mm).
- For profiles without special dimensional accuracy specifications, especially sponge rubber profiles.



Left: Vacuum sealing profile on high-performance chopper for the food industry
Right: Hollow profile ring on professional kitchen bowl for the food industry

Fabrication



Joining possibilities

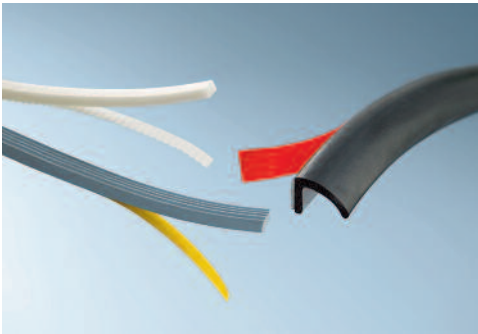
Angst + Pfister offers a variety of fabrication processes that enable extruded profiles to be bonded to frames or rings. The processes depend on the material employed.

For rubber types such as NR, EPDM, CR, NBR, FKM, VMQ, etc.:

- injection;
- autoclave vulcanization;
- hot-air vulcanization (adhesive mixture/foil);
- bonding (FKM and EPDM with limitations).

For thermoplastics such as TPU, PVC, etc.:

- hot plate welding;
- bonding.

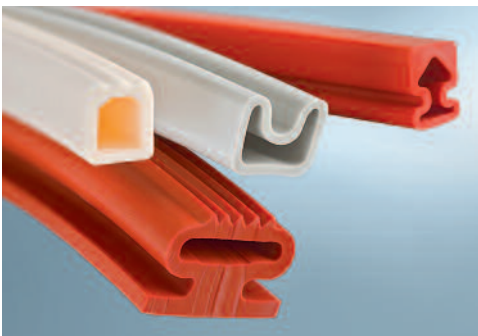


Self-adhesive backing

Profiles can be equipped with a self-adhesive backing, whether as an assembly aid or as a functional adhesive bond. For mass-produced profiles, self-adhesive stripping can be applied immediately after extrusion, or it can be applied afterwards by hand for small-series batches.

Mechanical processing

Mechanical processing encompasses subsequent cutting to length, drilling or notching of finished extruded fabricated elastomer profiles. Some of the mechanical processing work can also be executed immediately after extrusion.



Activatable AIRMATIC® sealing systems

When it is impossible or not economical to mechanically press seals onto horizontally or vertically movable elements, the sealing function can be achieved reliably and efficiently by means of employing pneumatically activatable, self-retracting AIRMATIC® sealing systems. Contact our Sealing Technology experts for detailed information on this Angst + Pfister specialty.



Left: AIRMATIC® sealing system mounted on the front pane of a clean-room isolation module

Right: Edge protection profile on public trash containers

Profile labeling and surface treatments



Profile labeling

Logos, item numbers, manufacture dates, batch numbers, etc., can be printed on profiles either directly during extrusion or afterward by hand using a pad printing process.



Surface treatments

Surface treatments are applied to profiles for purposes such as to prevent them from sticking together, to facilitate installation, to reduce coefficients of friction or to enhance resistance to destructive influences.

Talcum powdering

Powdered talcum is applied to the profile surface. This prevents profiles from sticking together during storage and enhances ease of assembly and installation.

Siliconization

A silicone oil is applied to the profile surface. The sliding properties improved this way are advantageous mainly for reducing assembly and installation forces. The silicone oil dries over time and thus loses its properties.

Antifriction coating

Process similar to siliconization. Antifriction coating enhances ease of profile assembly and installation and improves the sliding properties in the application. In contrast to silicone oil, the antifriction coating retains its properties after it dries.

PTFE spray coating

Liquid PTFE is sprayed onto the profile surface and then sintered in an oven. The microporous layer reduces static friction and prevents the profiles from sticking to other materials. Severe dynamic strains erode the coating relatively quickly. The PTFE spray-coating process is relatively cost-intensive.

Flocking

Tiny monofilament fiber particles (called flock) are deposited on the surface of a profile first coated with an adhesive. Flocking enables profiles with very good long-term sliding properties to be manufactured. Flocking is a very cost-intensive process that requires mandatory minimum production volumes.



Left: Facade profile for the construction industry

Right: AIRMATIC® sealing system on fluid bed dryer for the medical sector

Services from Angst + Pfister Group

Angst + Pfister – Your supply and solutions partner

The Angst + Pfister Group is a leading international technical manufacturer and service provider for high-end industrial components. As a supply and solutions partner for engineering plastics, sealing, fluid handling, drive, and antivibration technology as well as

sensors, Angst + Pfister combines efficient logistics concept with comprehensive product application engineering services. Besides providing customer-specific parts, the Group offers a product range consisting of approximately 100,000 standard items.

Our core product divisions



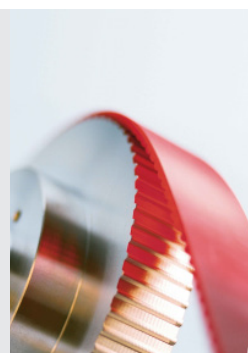
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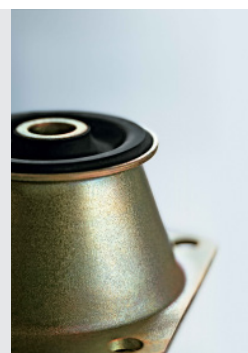
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Technology



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Antivibration
Technology

Switzerland

Angst + Pfister AG
Thurgauerstrasse 66, Postfach, CH-8052 Zürich
Phone +41 (0)44 306 61 11
www.angst-pfister.com, ch@angst-pfister.com

Angst + Pfister SA

Chemin de la Papeterie 1, CH-1290 Versoix
Phone +41 (0)22 979 28 00
www.angst-pfister.com, ch@angst-pfister.com

Germany

Angst + Pfister GmbH
Siemensstraße 5, DE-70736 Fellbach
Phone +49 (0)711 48 999 2-0
www.angst-pfister.com, de@angst-pfister.com

France

Angst + Pfister SAS
Immeuble DELTAPARC
93, avenue des Nations, FR-93420 Villepinte
Phone +33 (0)1 48 63 20 80
Fax +33 (0)1 48 63 26 90
www.angst-pfister.com, fr@angst-pfister.com

Austria

Angst + Pfister Ges.m.b.H.
Floridsdorfer Hauptstrasse 1/E, AT-1210 Wien
Phone +43 (0)1 258 46 01-0
Fax +43 (0)1 258 46 01-98
www.angst-pfister.com, at@angst-pfister.com

Italy

Angst + Pfister S.p.A.
Via Montefeltro 4, IT-20156 Milano
Phone +39 (0)2 8295 9700
www.angst-pfister.com, it@angst-pfister.com

Netherlands

Angst + Pfister B.V.
Afrikaweg 40, NL-2713 AW Zoetermeer
Phone +31 (0)79 320 3700
Fax +31 (0)79 320 3799
www.angst-pfister.com, nl@angst-pfister.com

Belgium

Angst + Pfister N.V. S.A.
Bedrijventrum Waasland Industriepark-West 75
BE-9100 Sint-Niklaas
Phone +32 (0)3 778 0128
Fax +32 (0)3 777 8398
www.angst-pfister.com, be@angst-pfister.com

China

Angst + Pfister Trade (Shanghai) Co. Ltd.
Rm 1803-1805, West Tower,
Zhong Rong Hengrui Building
No. 560 Zhangyang Road, CN-Shanghai 200122
Phone +86 21 5169 5005
Fax +86 21 5835 8618
www.angst-pfister.com, cn@angst-pfister.com

Turkey

Angst Pfister Advanced Technical Solutions A.Ş.
Akçalar Sanayi Bölgesi Kale Cd., No: 10,
TR-16225 Nilüfer/Bursa
Phone +90 224 280 69 00
Fax +90 224 484 25 96
www.angst-pfister.com/ats, ats@angst-pfister.com

Poland

Angst + Pfister Sp. z o.o.
ul. Komorowicka 260, PL-43-346 Bielsko-Biala
Phone +48 33 443 29 70
Fax +48 33 443 29 71
www.angst-pfister.com, pl@angst-pfister.com



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the Online Shop of Angst + Pfister
www.apsoparts.com