

APSOseal®

Flat Gaskets



Flat gasket solutions and products from a single supplier

In all areas of industry, sealing issues arise wherever substances and process fluids are handled, transported or stored. In the chemical industry, in refineries, in the energy production and conversion sector and in the food-and-beverage industry, inconspicuous or even invisible flat gaskets often have key importance. Since gaskets in their various areas of deployment are subjected to a wide range of different strains and stresses, numerous different materials with properties that deviate widely from each other are used to manufacture them. Among the most important deployment parameters are resistance to aggressive media, resistance to high or low temperatures, and resistance to high pressure loads. But the installation circumstances, the sealing strength required by the customer and a good price/performance relation are also key determinants for the choice of materials. By selecting the right sealing material from the start, subsequent gasket damage and attendant breakdown and repair costs can be avoided.

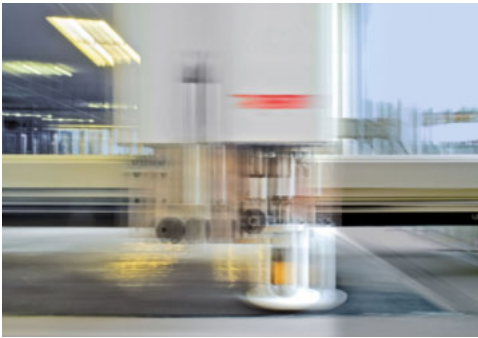


Engineering services

Angst + Pfister skillfully provides you with engineering services ranging from technical consultations to solving complex problems – even at the cutting edge of technology and materials. Ensuring seal reliability is our top priority. We also do everything we can to always find the best economic solution.

Stamping and cutting-to-size service

Our own stamping shop equipped with state-of-the-art, efficient automatic punching presses as well as a high-frequency cutter and a CNC water-jet cutting machine enables us to fabricate and supply any customized gasket contour with fast delivery times. Flexibility is our main mission at Angst + Pfister when it comes to meeting your wishes. We fabricate flat gaskets from all modern materials quickly, precisely and dimensionally correctly on the basis of drawings or prototypes. Using our extensive expertise and years of experience, we select the most economical fabrication method for each order. State-of-the-art computerized machine tools guarantee precision plate cutting to specified size and angle. On request we can supply any size of gasket in quantities ranging from very small to large-series batches. Whether we're punching, cutting, lathing or drilling, we always strive to perfectly execute customers' specifications.







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.



Range of base materials

Material	Temperature							Pressure rating	Chemical resistance	Elasticity	Resilience	Gas impermeability	Resistance to hot water and steam	Mechanical strength	
	°C							MPa							
Elastomers 	-300	-200	-100	+100	+200	+300	+400	+500	≤ 2	B/C	A	C	B/C	B/C	B/C
Fiber composites 	-300	-200	-100	+100	+200	+300	+400	+500	≤ 20	B	B	A/B	A/B	A	A
PTFE 	-300	-200	-100	+100	+200	+300	+400	+500	≤ 10	A	B/C	B/C	A	B	B/C
Graphite 	-300	-200	-100	+100	+200	+300	+400	+500	≤ 40	A	A/B	B	B	A	B

A = very good B = good C = moderate D = poor

Application examples

Flat gaskets are mainly used for static sealing of flange joints, receptacles, encasements and lids. Specialty sealing materials and gasket types are continually being developed and optimized. Our innovative assortment of flat gaskets covers the full range of customer requirements.



Graphite gaskets for high-temperature reactors



Deployment of NOVATEC® Premium in a salt extraction plant



NOVAFLO® flat gaskets in energy transport system

Elastomer flat gaskets

Angst + Pfister stocks a very balanced inventory of elastomer sealing plates. We supply calendered and compression-molded roll stock and plate stock, from which we punch flat gaskets that perform superbly as low-pressure seals. The pressure fluids or gases determine the choice of material.

Main deployment areas: Mechanical and equipment engineering, sanitary and plumbing technology, food-and-beverage industry.



Properties of elastomers

Material	Trade name	Temperature	Hardness	Media resistance ^①	Approval/certification	Special properties
		°C	Shore A			
NBR Acrylonitrile-butadiene elastomer	A+P E A+P S ALIMENTA white HSS [®] yellow MEMBRIT	-30 to +100 (in some cases up to +70; for brief periods up to +120)	60 – 86	Mineral oils/lubricants; limited resistance to acids, water, synthetic oils/lubricants, super gasoline, diesel oil		A+P: compression-molded NBR plates with high nitrile content; HSS [®] yellow: resistant to all mineral-oil-based fuels; MEMBRIT: with fabric insert, not transversely impermeable
NBR/SBR NBR and styrene-butadiene elastomer	A+P BENOLA	-40 to +70 (for brief periods up to +100)	50 – 65	Mineral oils/lubricants; limited resistance to acids, water, synthetic oils/lubricants, diesel oil		BENOLA: with fabric insert, not transversely impermeable
NR/SBR Natural rubber and styrene-butadiene elastomer	PARA super DIPLA	-40 to +70	40 DIPLA: 70	Scant resistance		High abrasion resistance
SBR Styrene-butadiene elastomer	PARA black	-40 to +70	50	Scant resistance		High abrasion resistance
CR Chloroprene elastomer (neoprene)	CR media	-30 to +70 (for brief periods up to +100)	50	Weathering, ozone, water; limited resistance to acids	BZS	
CR/SBR	CR standard NEOTEX	-30 to +70 (NEOTEX for brief periods up to +100)	60 – 65	Weathering, ozone, water; limited resistance to acids		NEOTEX: with fabric insert, not transversely impermeable
EPDM Ethylene-propylene-diene monomer elastomer		-40 to +120 (for brief periods up to +150)	70	Weathering, ozone, water, synthetic oils/lubricants	KTW FDA (in white)	
FKM Fluoroelastomer	VITON [®]	-20 to +200 (for brief periods up to +220)	75	Weathering, ozone, acids, mineral oils/lubricants, synthetic oils/lubricants, super gasoline, diesel oil; limited resistance to water		
VMQ Silicone	Silicone FDA Silicone FDA auburn	-60 to +200 (for brief periods up to +220)	50 – 60	Ozone, weathering, water, mineral oils/lubricants, synthetic oils/lubricants limited resistance to acids	FDA	
CSM Chlorosulfonated polyethylene elastomer	HYPALON [®]	-20 to +120	65	Ozone, weathering, acids; limited resistance to mineral oils/lubricants, synthetic oils/lubricants		
FFKM Perfluoroelastomer	KALREZ [®] 4079 KALREZ [®] 6375	up to +315 (compound 4079)	75	Weathering, ozone, water, acids, mineral oils/lubricants, synthetic oils/lubricants, super gasoline, diesel oil		

Fiber-composite flat gaskets

The newest generation of fiber-composite materials further optimizes sealing properties. Graphite-filled high-pressure gaskets reinforced with KEVLAR® pulp and with a low binder concentration have proven themselves exceptionally well. A surface coating on both sides provides an anti-sticking effect.

Main deployment areas: Chemical industry, mechanical engineering, food-and-beverage industry, sanitary and plumbing technology, heating technology.



Properties of fiber-composite materials

Material	Temperature °C	Pressure rating MPa	Media resistance	Approval/ certification	Deployment area	Special properties
NOVAPRESS® Basic	-100 to +200	8.5	Water Steam Gases Aqueous solutions Oils Refrigerants	DVGW SVGW HTB KTW VP 401 WRAS W270	Sanitary technology Gas and water supply Pipeline engineering Plant engineering Mechanical engineering	Aramid fibers with special fillers and NBR binder, anti-stick coating on one side Color: orange
NOVAPRESS® Universal	-100 to +250	10	Water Steam Gases Aqueous solutions Oils Refrigerants	DVGW SVGW HTB KTW WRAS BAM TA Luft	Gas and water supply Pipeline engineering Plant engineering Mechanical engineering Food-and-beverage industry	Aramid fibers with special fillers and NBR binder, PTFE coating on both sides Color: light green
NOVAPRESS® Activ	-100 to +150	4	Oils Fuels Gases	None	Plant, apparatus and transformer construction Automobile industry Mechanical engineering	Aramid fibers with special fillers and NBR binder Color: brown/red
NOVAPRESS® Flexible 815	-100 to +250	5	Water Steam Gases Aqueous solutions Oils Refrigerants	DVGW SVGW BAM	Gas and water supply Pipeline engineering Plant engineering Mechanical engineering	Aramid fibers with special fillers and NBR binder Color: green/natural
NOVATEC® Premium II	-100 to +300	10	Water Steam Gases Acids Alkalis Aqueous solutions Oils Refrigerants	DVGW SVGW KTW WRAS W270 VP 401 BAM TA Luft	Petrochemistry Chemical industry Plant engineering Mechanical engineering Pipeline engineering Gas supply	Aramid fibers with pure graphite, bonded with NBR; A310 anti-stick coating on both sides Color: royal blue
NOVATEC® Special	-100 to +360	10	Water Steam Gases Acids Alkalis Aqueous solutions Oils Refrigerants	KTW	Petrochemistry Chemical industry Plant engineering Mechanical engineering Pipeline engineering Gas supply	Aramid fibers with pure graphite, bonded with NBR; A310 anti-stick coating on both sides Color: golden brown

Depending on the type of media involved and the deployment temperature, the maximum pressure resistance can deviate from the above values or needs to be determined.

PTFE flat gaskets

There is an extremely varied array of application possibilities for PTFE flat gaskets. Thanks to their universal chemical resistance and wide deployment temperature range, sealing elements made from this material have proven themselves over and over again.

Main deployment areas: Chemical plant engineering, pharmaceutical and laboratory industry, petrochemistry, food-and-beverage industry, mechanical engineering.



Properties of PTFE

Material	Temperature °C	Pressure rating ^① MPa	Media resistance	Approval/ certification	Deployment area	Special properties
TEADIT® 24B flat gasket tape	-240 to +260	20	Universal chemical resistance	DVGW TA Luft BOC WRAS BAM FDA	Chemical and pharma industry Food-and-beverage industry Plant engineering	Monoaxially expanded pure PTFE Color: white
UCAR-323™ LC	-200 to +245	7	Universal chemical resistance	FDA	Petrochemistry Chemical and pharma industry Food-and-beverage industry	PTFE TEFLON® with glass fiber fabric Color: anthracite
NOVAFLON® 100	-210 to +260	5.5	Universal chemical resistance	FDA TA Luft	Petrochemistry Chemical and pharma industry Food-and-beverage industry	PTFE with hollow glass microspheres Color: light blue
NOVAFLON® 200	-210 to +260	8	Universal chemical resistance	FDA TA Luft DVGW BAM	Chemical and pharma industry Food-and-beverage industry	PTFE with barium sulfate Color: white
NOVAFLON® 300	-210 to +260	8	Universal chemical resistance	FDA TA Luft DVGW BAM	Petrochemistry Chemical industry	PTFE with silica Color: fawn
NOVAFLON® 500	-210 to +260	10	Universal chemical resistance	FDA TA Luft	Petrochemistry Chemical and pharma industry Food-and-beverage industry	Multidirectionally expanded pure PTFE Color: white
PTFE-enveloped flat gaskets	-210 to +260	2	Universal chemical resistance	FDA	Chemical and pharma industry Food-and-beverage industry Plant engineering	Pure PTFE envelope Various different sub- strates Color: white

Depending on the type of media involved and the deployment temperature, the maximum pressure resistance can deviate from the above values or needs to be determined.

Graphite flat gaskets

Near-universal chemical resistance combined with extraordinary physical properties makes the flexible graphite material the ultimate problem-solver in the area of sealing technology.

Main deployment area: Chemical plant engineering, petrochemistry, refineries, nuclear power plants and refrigerating plants, mechanical and equipment engineering.



Properties of graphite

Material	Temperature °C	Pressure rating ^① MPa	Media resistance	Approval/ certification	Deployment area	Special properties
GRAFOIL® AP-S	-200 to +500	10	Universal chemical resistance	DVGW BAM	Petrochemistry Chemical industry Plant and equipment engineering	Pure graphite laminate with tanged stainless steel insert 1.4401
GRAFOIL® AP-G	-200 to +500	7	Universal chemical resistance	DVGW	Petrochemistry Chemical industry Plant and equipment engineering	Pure graphite laminate with smooth stainless steel insert 1.4401
NOVAPHIT® SSTC TA Luft	-240 to +550	20	Universal chemical resistance	DVGW BAM TA Luft Firesafe	Petrochemistry Chemical industry Plant and equipment engineering	Pure graphite laminate with chrome-nickel steel insert 1.4404
Leader Gasket metallic spiral- wound gaskets	-240 to +550	40	Universal chemical resistance	BAM	Petrochemistry Chemical industry Plant and equipment engineering	Metallic winding strip 1.4541 with pure graphite sealing filler

Depending on the type of media involved and the deployment temperature, the maximum pressure resistance can deviate from the above values or needs to be determined.

Services from Angst + Pfister Group

Angst + Pfister – Your supply and solutions partner

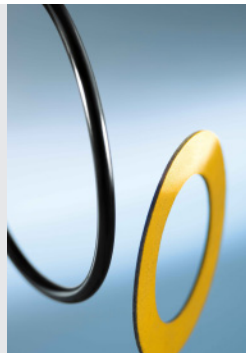
The Angst + Pfister Group is a leading international technical manufacturer and service provider for high-end industrial components. As a supply and solutions partner for engineering plastics, sealing, fluid handling, drive, and antivibration technology as well as

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



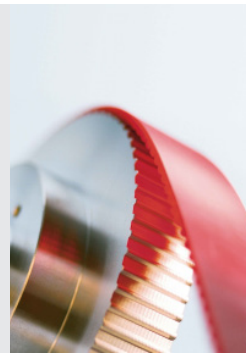
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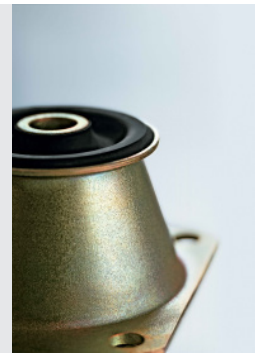
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