

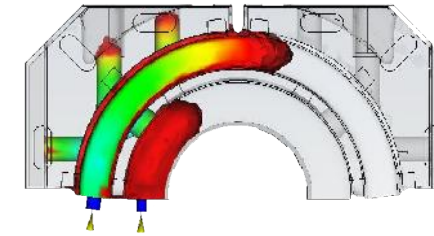
APSOvib®
Antivibration Technology



APSOvib® Antivibration Technology

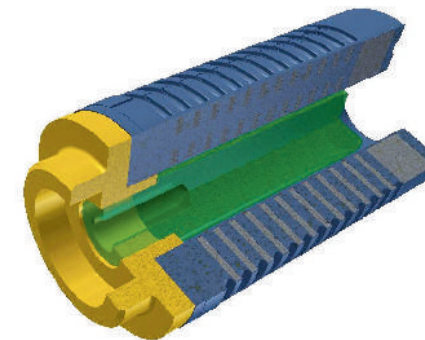
In our modern world, vibration generated by machines and equipment is disturbing in many domains. The design of a structure or mechanism can be greatly improved by the integration of the most appropriate isolation element already in the initial phase.

Over the past few years, Angst+Pfister has designed and carried out several hundred different "high-efficiency" solutions for a wide range of applications such as suspension and isolation of machines, engines, cabins, construction and agriculture machines, tractors and special vehicles, generators, compressors, HVAC, wind turbines, railway bogies and bus suspension as well as floating floors for trains and tramways.



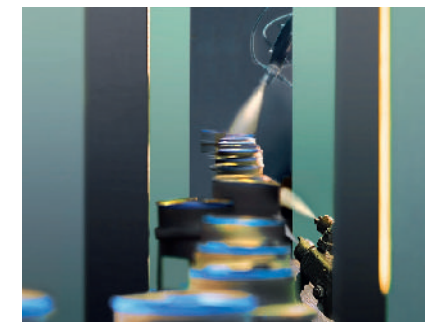
In some cases, vibration can also be the main cause of serious damages. By making the right choice during the development phase, it is possible to significantly reduce the costs, stagger maintenance and increase lifetime.

Angst+Pfister is a recognized specialist for antivibration solutions. Outstanding application know-how and a wide range of components will provide a cost-optimal solution to any challenge – be it with a product of our broad standard assortment or with a customer-specific solution. The wide product range of antivibration elements extends from the simplest of round buffers to the high-deflection mounts. Our products are compliant with the EU fire protection standard EN 45 545.



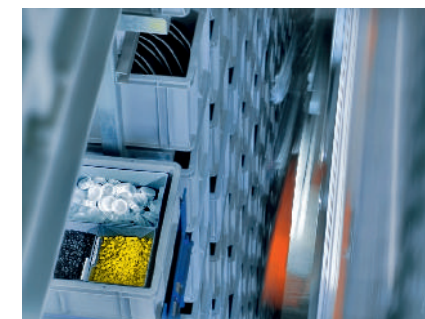
Engineering Services: Expertise for the benefit of customers

Excellent knowledge of materials, customer- and solution-focused consulting, profound manufacturing know-how and technical engineering support is the link that connects all Angst+Pfister's product lines. Our specialists pass their knowledge on to customers in the course of order fulfillment. Virtual design and development of components using CAD/CAE tools including Finite Elements Analysis and 3-D prototyping are just as much a part of our engineering portfolio as our technical expertise. Thanks to these services, Angst+Pfister customers receive more than just parts; they obtain components perfectly tailored to their specific requirements.



Global Production Platform: High-quality components for the highest requirements

Angst+Pfister has production facilities in 15 countries worldwide. This global orientation always provides our customers with the most cost-effective production environment – even before considering our competitive ability to meet quantity, logistical and quality requirements.



Logistics, quality assurance and customer focus worldwide

Our state-of-the-art logistics center is the linchpin of Angst+Pfister's logistical services. At the roughly 23,000-square-meter logistics center, 140,000 different stock-keeping units are warehoused and more than 1,500 separate items are reliably processed and shipped daily. Excellent C-parts management coupled with a world-spanning procurement network guarantees high product availability – even for custom items – with fast delivery times. With just-in-time, Kanban, supply management and other logistics concepts, Angst+Pfister enables customers to synchronize their incoming parts shipments to precisely match their production rhythm and to thus minimize inventory carrying costs. Our ISO 9001: 2008, ISO 14001:2004 and ISO/TS 16949:2009-certified complete quality assurance system additionally enables customers to greatly simplify their incoming goods inspection procedures.

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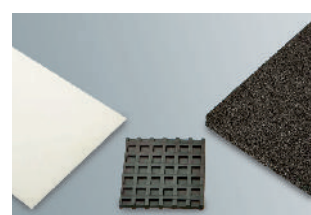
APSOvib® - Mounts for mobile applications
Product assortment to securely mount devices onto mobile applications



APSOvib® - Mounts for static applications
Specially designed for static applications to insulate against vibration and slipping



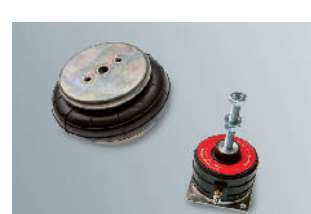
APSOvib® - Buffers, rubber springs, rubber hollow springs, bushings
Standard antivibration assortment suitable for a wide range of diverse applications to dampen vibrations



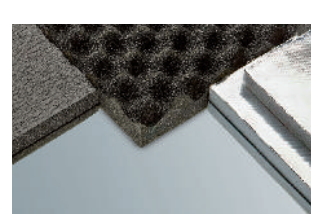
APSOvib® - Insulating mats
Special insulation mats providing the most effective vibration and slip protection covering the whole ground surface of machines or installations



APSOvib® - Leveling machine mounts
Leveling machine mounts allow mounting machines on uneven ground



APSOvib® - Spring elements, air springs, metal springs
Spring element assortment for sensitive devices and low frequency



APSOvib® - Acoustic insulation materials
Special acoustic insulation materials used in the field of technical acoustics to either absorb noise emissions or prevent noise emitting to the outside

Under the APSO (Angst + Pfister Solutions) brand, our engineering specialists develop customized solutions for practically any application within our five core product areas.

APSOvib® - Mounts for mobile applications, with anti-tear safety device

Element	Description	Technical data			Insulation capacity					Key applications							
		Load capacity in N	Natural frequency in Hz	Spring deflection in mm	High axial flexibility	High radial flexibility	High axial and radial flexibility	Medium and low frequency	Protection against bump & shock	HVAC / Fans	Genset	Pumps & compressors	Gearboxes	Combustion engines	Vehicle cabs	Machinery & presses	Electrical enclosures
	APSOvib® Machine mounts with anti-tear safety device	Universal applicable elements for vibration insulation of machines and devices; small overall height; horizontal stiffness higher than vertical stiffness	< 2450	> 9	< 3.5	•			•								
	APSOvib® Machine mounts with reinforced body and anti-tear safety device	Specially designed for mobile devices where large accelerations can occur and only a little installation space is available	< 2500	> 9.2	< 3	•											
	APSOvib® Conical bearings	Available in six different sizes, each in three degrees of hardness and progressive damping; break-away-proof thanks to the use of stop washers	< 30000	> 6	< 7				•	•	•	•	•	•	•		
	APSOvib® Conical bearings HD High Deflection	Designed for the agriculture and construction machinery, for shock absorption and insulation of engine vibrations from cabins	< 5000	> 6.2	< 6.5				•	•	•						
	APSOvib® CUPMOUNT Storage elements	Can be used in compression, tension and shear; especially for bearings on vehicles; wall and ceiling mounts	< 6480	> 11.8	< 1.8				•								•
	APSOvib® Marine mounts	Designed for shipbuilding, generators and diesel engines	< 9400	> 6.5	< 6				•	•	•						
	APSOvib® High-efficiency genset mounts	Specially designed for large generators and diesel engines to provide optimal vibration insulation; the built-in protective cap protects the element against splashing water or oil	< 42000	> 4	< 16	•			•	•	•						
	APSOvib® H-Mounts	Safe antivibration support; good insulation against structural noises; designed for cabins	< 10 000	> 13	< 1.5				•								•
	APSOvib® Insulating rings	Suitable for elastic bearings; subjected to traction force; pre-tensioned in pairs against each other	< 3720	> 11.5	< 1.9	•											•

APSOvib®
Mounts for mobile applications
















This product assortment is designed for use wherever devices like generators or compressors need to be securely mounted into trucks, buses or other moving vehicles like a cooling van for example and to effectively protect against vibration and noise.

Here it is most important that the device does not tear off even in the case of an accident. In such a shock situation, the Angst + Pfister mounts for mobile applications guarantee a tear-off resistance for an acceleration of 5G and more due to their metal-on-metal construction.

Furthermore, they provide ideal insulation protection against all kinds of possible vibrations within the mobile application. Those are not only caused by the mounted device itself but by the running vehicle or the environment like unevenness of the street or road holes.

APSOvib® – Mounts for static applications

Element	Description	Technical data			Insulation capacity						Key applications							
		Load capacity in N	Natural frequency in Hz	Spring deflection in mm	High axial flexibility	High radial flexibility	High axial and radial flexibility	Medium and low frequency	Protection against bump & shock	HVAC / Fans	Genset	Pumps & compressors	Gearboxes	Combustion engines	Vehicle cabs	Machinery & presses	Electrical enclosures	
 APSOvib® Machine mounts with screws	Universal applicable elements for vibration insulation of machines and devices; small overall height; horizontal stiffness higher than vertical stiffness	< 20600	> 8.5	< 3.5	•	•				•					•	•		
 APSOvib® Machine mounts without screws					•	•												•
 APSOvib® Shear mounts APK	Designed for rotating machines such as ventilators, compressors and air conditioners with low fly wheel unbalance	< 14300	> 7	< 5		•	•			•	•				•	•		
 APSOvib® Bell-shaped elements	These elements are secured against tearing off and are installed as a suspension element; the construction also provides security in case of fire	< 490	> 7.9	< 4	•		•			•					•	•		
 APSOvib® Machine mounts HD < 50 kg	Optimal vibration insulation for compressors and light machines with low frequency; the contact faces are completely sealed against outside media	< 500	> 6.5	< 6			•	•		•	•				•	•		
 APSOvib® Machine mounts HD > 50 kg	Optimal vibration insulation for compressors and light machines with low frequency; the contact faces are completely sealed against outside media	< 4000	> 6.5	< 6			•	•		•	•				•	•		
 APSOvib® Rubber metal rails	For oscillation insulating bearings of heavy systems; can be cut to the required dimensions; the thickness of the vulcanized metal sheet allows the threading	< 450000	> 6	< 7	•		•				•	•	•	•		•		
 APSOvib® FLEX-LOC Screw insulation	The simple solution for the assembly of appliances or the joining of sheets, metal plates and glass panes	< 275	–	–			•			•					•	•		
 APSOvib® Bearings	Suitable for an elastic bearing of motor and stationary equipment; the supplied stop plates can limit the spring travel of the elements in pressure and tensile direction to prevent any overload	< 4120	> 5.3	< 9.1			•	•		•	•				•	•		
 APSOvib® U, V and W Bearings	For elastic setups of sensitive instruments that must be protected against vibrations	< 590	> 8.5	< 3.5			•			•	•				•	•		
 APSOvib® Suspension elements	For elastic setups of sensitive instruments that must be protected against vibrations	< 1120	> 6.5	< 5.9			•	•		•	•				•	•		
 APSOvib® Hat-shaped elements	Specially suited for storing of small devices; laterally stable; enable low-frequency storage	< 1370	> 5	< 10	•		•			•	•				•	•		
 APSOvib® Ceiling elements with threaded bolt and with threaded hole	Classic hanging elements, suitable for elastic suspension of lamps and tubes	< 280	> 8.5	< 3.5	•					•	•				•	•		
 APSOvib® Ring elements SM	Optimal vibration insulation for light devices with low frequency	–	–	–			•	•		•	•				•	•		







APSOvib®
Mounts for static applications



These mounts are specially designed for static applications. On the one hand, they provide effective insulation against vibrations and on the other hand prevent the machine from slipping away.

The range of applications reaches from light low-frequency machines and rotating machines like ventilators or compressors to suspension constructions and heavy machines.

APSOvib® - Buffers, rubber springs, rubber hollow springs, bushings

Element	Description	Technical data			Insulation capacity					Key applications								
		Load capacity in N	Natural frequency in Hz	Spring deflection in mm	High axial flexibility	High radial flexibility	High axial and radial flexibility	Medium and low frequency	Protection against bump & shock	HVAC / Fans	Pumps & compressors	Gearboxes	Combustion engines	Vehicle cabs	Machinery & presses	Lift & elevators	Electrical enclosures	Laboratory equipments
	APSOvib® Cylindrical buffers	Suitable for elastic fastenings and oscillation insulating mounts of small and medium-sized devices; types A, B, C, D, E, F according to DIN 95363	< 17 000	> 5.1	< 9.7			•	•		•	•			•	•	•	•
	APSOvib® Stop buffers	Suitable for all kinds of stops and for oscillation insulating mounts of small and medium-sized devices; types A, B, C, D, E, F, G according to DIN 95364	< 19 000	> 5	< 10.3	•				•	•			•	•	•	•	•
	APSOvib® High-energy absorption crane and SK buffers with threaded bolt or nut	Overload spring for vehicles and impact buffers on craneways	< 1 050 000	> 2	< 450	•								•	•	•		
	APSOvib® Rubber and urelast springs	As springs primarily in pressing techniques, in tools and in machine engineering	< 66 650	> 2.5	< 50	•												•
	APSOvib® Rubber hollow springs	Universally applicable springs, especially where long spring travel is required	< 22 000	> 3	< 29.5			•	•									•
	APSOvib® Bushings vulcanized and pressed	Suitable as rotary springs or maintenance-free bearing for wheel suspension, available in two different finishes, vulcanized or pressed	< 21 000	> 11	< 2			•				•	•	•	•			•

APSOvib®
Buffers, rubber springs, rubber hollow springs, bushings




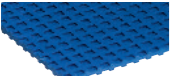


This product group of standard antivibration products is suitable for a wide range of diverse applications to damp vibrations.

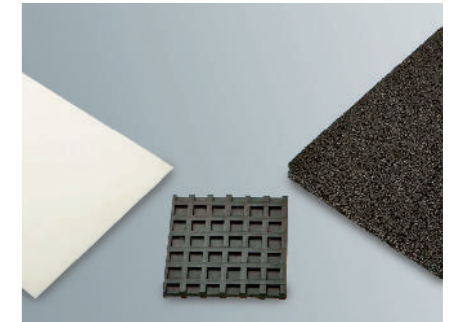
Where buffers and rubber springs are used for vibration insulation concerning machines and installations, rubber hollow springs find their application where long spring deflections are needed. A great variety of elastomers in different Shore hardnesses in combination with metal components offers lots of construction possibilities for versatile applications.

Bushings can be used as elastic bearing in all three axes of motion so that it becomes a unique torsion spring having a functionality that can otherwise only be achieved by combining many different machine components.

APSOvib® - Insulating mats

Element	Description	Technical data			Key applications												
		Load capacity in N/mm ²	Natural frequency in Hz	Spring deflection	HVAC / Fans	Genset	Pumps & compressors	Vehicle cabs	Anti-slip mats	Railway for rolling stock	Railway for track structure	Floor insulation	Building	Machinery & presses	Lift & elevators	Electrical enclosures	Laboratory equipments
	ECOViB® Recycled rubber/cork and rubber damping mats	Recycled rubber mats with high requirements for impact sound insulation; ideal for use in building construction, railway and industrial applications; cork and rubber cork mats for floor panels in railway and shipbuilding	From 0.05 to 2	> 10	Up to ~10% of the thickness	•	•	•		•	•	•	•	•			
	ECOViB® Anti-slip mats	Used in transport traffic as well as in the packaging industry as a protective layer; anti-slip mat for securing the load with good sliding friction values according to VDI 270014; sliding friction coefficient: 0.81	0.6						•								
	APSOvib® High-energy absorption plates and seals	Absorptive support surfaces; devices and foundation bearings; high dynamic loading	From 0.21 to 0.92	> 5	Up to ~20 to 30% of the thickness			•	•	•				•	•	•	•
	APSOvib® Heavy-duty plates, rubber cork and ribbed damping mats	Construction perforated mats and sound-damping blocks	From 0.3 to 2				•	•						•		•	












APSOvib®
Insulating mats



Depending on the material, these special insulation mats provide the most effective vibration and slip protection covering the whole ground surface of machines or installations or – on large scale – even buildings.

ECOViB® anti-slip mats are flexible, customized high-performance solutions that mainly find their perfect application in the secure transportation of loads. Placed underneath the whole underside of the load, ECOViB® anti-slip mats significantly reduce any slip-page due to their high friction coefficients.

APSOvib® - Leveling machine mounts

Element	Description	Technical data	Key applications							
		Load capacity in N	Devices & equipment	HVAC / Fans	Food and chemical industry	Pumps & compressors	Machine tools	Heavy machine tools & presses	Logistic	Laboratory equipments
	APSOvib® Machine mounts with polyamide base plate reinforced by fiber glass and stainless steel articulated screw	< 45 000	•	•	•		•		•	•
	APSOvib® Machine mounts with polyamide base plate, mini series	< 4 000	•	•	•		•		•	•
	APSOvib® Machine mounts, standard	< 14000	•			•	•			
	APSOvib® Machine mounts with rigid screw	< 14000	•			•	•			
	APSOvib® Machine mounts type MAKO	< 35000	•			•	•			
	APSOvib® Machine mounts type LEVEL MOUNT® with and without base plate	< 40000	•			•	•			
	APSOvib® Machine mounts, heavy series	< 90000						•		
	APSOvib® Machine mounts stainless steel and articulated screw	< 30000	•		•		•			•
	APSOvib® Fixation elements, with and without rubber base plate, steel and stainless steel	< 30000	•	•		•	•		•	
	APSOvib® Precision wedge mounts	< 50000						•		
	APSOvib® SUPER-GRIP Corners and edges	< 2 000	•		•		•			•

APSOvib®
Leveling machine mounts







Leveling machine mounts allow mounting machines on uneven ground. Their integrated leveling system easily allows a safe and precise installation on even as well as uneven ground and effectively prevents the machine from slipping away. Particularly suitable for machines without floor fixing.

Leveling machine mounts insulate against vibrations, they are shock-absorbing and damp the structure-borne sound. The insulator is highly resistant against aging, grease, oil and detergents.

Depending on the application Angst+Pfister offers numerous designs, types and different material combinations. For example, there are special designs for installations in inclined positions or a wide range of stainless steel and plastics applications especially designed for the food and beverages industry.

For the installation and levelling of tool machines and heavy installations, Angst+Pfister offers specially designed wedges.

APSOvib® – Spring elements, air springs, metal springs

Element	Description	Technical data			Insulation capacity					Key applications							
		Load capacity or force in N	Natural frequency in Hz	Spring deflection or stroke in mm	High axial flexibility	High radial flexibility	High axial and radial flexibility	Medium and low frequency	Protection against bump & shock	HVAC / Fans	Agriculture & construction machinery	Genset	Pumps & compressors	Trucks & special vehicles	Machinery & presses	Electrical enclosures	Laboratory equipments
	APSOvib® Air springs	Suitable for passive insulation of scales, gauges and also for active insulation of slow-running devices such as ventilators and compressors	< 98 100	> 2.5	< 40	•			•		•		•	•	•	•	•
	APSOvib® Air bellows	Oscillation insulating elements to dampen active and passive oscillations of structure-borne noise, vibrations and thrusts	< 61 000	> 1.5	< 110	•			•		•		•	•			
	APSOvib® Spring assemblies with sordino damping	Suitable for oscillation insulation setup of machines and systems of all kinds; insensitive to spray water; characterized by low natural frequencies and linear spring rates	< 31 400	> 2.5	< 48	•			•					•			•
	APSOvib® Spring assembly, HVAC serie	For vibration insulating installation of equipment; with low natural frequencies and linear spring rates	< 5 000	> 3	< 30	•			•		•	•					•

APSOvib®
Spring elements, air springs,
metal springs





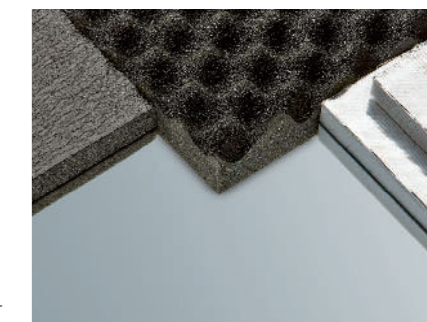
Within the group of spring elements, air springs find their application where regular checks are required and possible for example in the automotive industry concerning mainly trucks or trailers or for mounting of sensitive devices. They distinguish themselves through a very low frequency nearly independent of load.

Metal springs are particularly suitable for insulation of aggressive shock effects.

APSOvib® – Acoustic insulation materials

APSOvib®
Acoustic insulation materials

Element	Description	Technical data					Key applications							
		Impact sound absorption materials	Impact and airborne sound absorption materials	Structure	Working temperature	Color	Fire resistance	Tractors & agricultural machinery	Busses & commercial vehicles	Wagons & locomotives	IC engines & gear boxes	Machine tools	Laboratory equipments	Buildings
 <p>APSOvib® Acoustic insulation materials</p>	Self-extinguishing polyester-based open cell expanded polyurethane resin AUHF1 with an embossed profiling which has undergone a treatment of copolymer coagulation	•		Pyramid	-50 to +110°C	Black	UL94 HF1	•	•	•	•	•	•	•
	Self-extinguishing polyester-based open cell expanded polyurethane resin AUHF1 subjected to a treatment of coagulation of a copolymer 25 µm; water impermeable; dust- and oil-proof; treatment of copolymer coagulation	•		Flat	-70 to +110°C	Black	UL94 HF1	•	•	•	•	•	•	•
	Polyester fibers suitably treated; carded, faldate and thermo-linked; with both sides specially smoothed; high capacity of thermal and acoustic insulation	•		Flat	-40 to 130°C	Black	Reaction to fire CL 1	•	•	•	•	•	•	•
	Halogen- and CFC-free fire-resistant open cell expanded melamine resin with TVVN/B	•		Flat	up to 150/200°C	White	Class 0/Class 1	•	•	•	•	•	•	•
 <p>APSOvib® Acoustic absorption materials</p>	Layers of polyurethane open cell alternating with layers of loaded rubber	•		Flat	-50 to +110°C	Black	UL94 HF1	•	•	•	•	•	•	•
	Halogen- and CFC-free, fire resistant open cell expanded melamine resin with an internal layer of loaded rubber	•		Flat	up to 150/200°C	Grey	Class 1	•	•	•	•	•	•	•
	Resin of polyurethane foam with open cells, coupled to a layer of loaded rubber; subjected to a treatment of coagulation of a copolymer; impermeable to water, dust and oil	•		Flat	-50 to +110°C	Black	UL94 HF1	•	•	•	•	•	•	•



These products are used to reduce the noise in industrial plants, machinery and in the building sector.

Depending on the application, the different materials are designed to either absorb the noise emission for example by lining the inner walls of a room or to prevent the noise from emitting to the outside.

Angst+Pfister offers the suitable materials for all kinds of possible solutions. From the encapsulation with sound-proofing/absorbent materials, with a one- or two-layer structure in order to obtain a very effective reduction in noise, to damping achieved by coating sheet metal with damping panels or with masses for spray or brush applications or the installation of protective shields around the noise sources by using soundproofing/absorbent panels.

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



APSOplast®
Engineering Plastics
Technology



APSOseal®
Sealing
Technology



APSOfluid®
Fluid Handling
Technology



APSOdrive®
Drive
Technology



APSOvib®
Antivibration
Technology

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