Angst+Pfister

FOOD PROCESSING INDUSTRY MAGAZINE

International Solutions for Food Processing Industry

Editorial

Dear readers and valued customers,

Not all that long ago, we developed a solution for one of our numerous customers in the food and beverage industry that allowed him to extend the service life of the components installed in his plant more than fivefold.

Like many others in his field, that customer has long since recognized that investment decisions should not be based solely on the estimated cost of acquisition. An intelligent and holistic business strategy means looking beyond: Generally, the investment pays for itself through a reduction in operating costs over the entire machine lifecycle and through savings on indirect costs. Our premium-quality industrial components and innovative solutions make it possible to significantly reduce the amount of maintenance required and thus greatly reduce maintenance costs while vastly improving the consistency of production and company performance. Above all, our individually tailored solutions can save our customers hundreds of thousands of euros – every year, of course.

If you also take a holistic approach to business, then you start during the planning stage: The sooner you involve our engineers in the specification of individual components, the more efficiently you will be able to plan and develop new systems and plants. Drive technology, fluid handling and sealing technology as well as plastics and antivibration technology: Beyond our standard range of 100,000 high-quality industrial components, we have a specialized international team of engineers in each of these five areas dedicated to finding the right solution for you.

Our engineers know their business – and that includes keeping on top of all national and international certification standards. All of our components are certified in accordance with the stringent European directive 1935/2004 as well as the demanding FDA regulations on contact with food. Our parts even meet the more rigorous 3A sanitary standards applying to the processing of milk. Our experience with certification processes spans the course of several decades, and we closely and continuously analyze and evaluate new standards and regulations with regard to additional regions or countries. Our extensive experience also applies to areas such as heat, vapor and chemical resistance.

At Angst+Pfister, the food and beverage industry and the packaging industry are core business areas, and this is by no means a recent development. Large multinational corporations have been amongst our customers for many decades – as have key national and regional specialists. We take equal care in our dealings with all of them. During their cooperation with us, each of them has discovered new ways to maximize their potential savings: Because they can turn to a single partner for all their drive, fluid handling, sealing, plastics and antivibration technology needs, they can reduce the number of suppliers. They also know that they can profit from Angst+Pfister's global approach to production. We don't manufacture where it is cheapest, but instead where the desired quality can be achieved at a consistently high level and at a fair price. Finally, to name just one more savings factor, you can rely on an efficient and flexible supply chain tailored to fit your individual needs.

Jean-Pierre Baroni
Managing Director, Angst+Pfister Italy

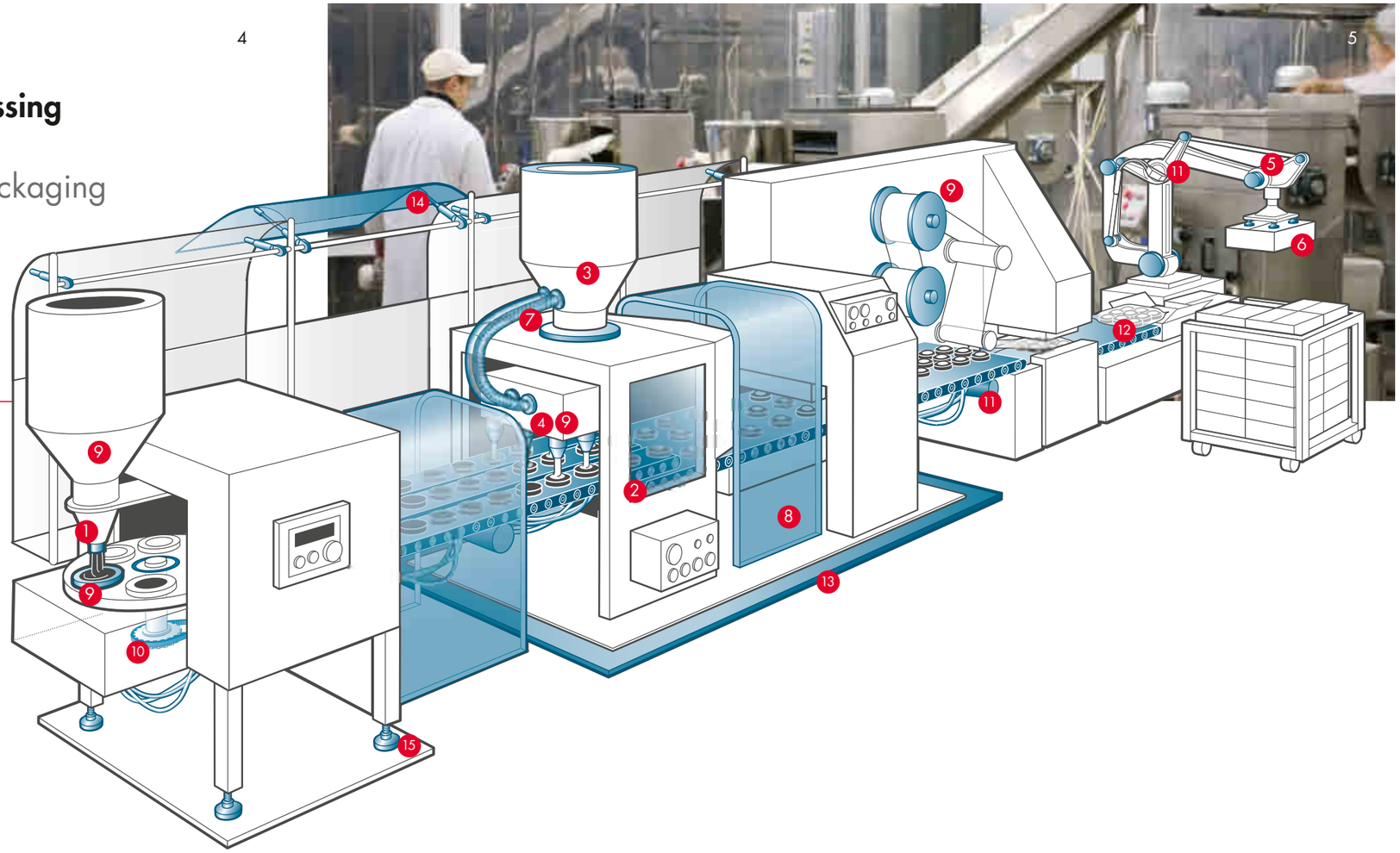
Content

Cover photo: ©Getty Images

Do you have any further questions on one of the topics in the magazine?
Please send an e-mail to engineering@angst-pfister.com or call +41 44 306 62 57.
We will contact you immediately.

Angst+Pfister – Your Partner for Food Processing and Packaging Technology Ensuring smooth operations along the food processing and packaging lines.

Working together to design successful solutions For over half a century, Angst+Pfister has served the leading manufacturers and operators within the food processing and packaging equipment industry by supplying them with uncompromisingly high-quality products and comprehensive engineering solutions. Forward-looking products, innovative capabilities and an insightful understanding of our customers' needs make Angst+Pfister the ideal solutions and logistics partner for the food industry.

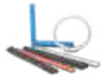


APSOseal®
Sealing Technology

High dependability with quality O-Rings, rotary shaft seals, profiles and flat gaskets for food processing machinery.


O-Rings/
Round Cords 1


Molded Seals 4


Elastomeric Profiles 2


Translational and
Rotational Seals 5


Punched Flat
Gaskets 3

APSOfluid®
Fluid Handling Technology

High-quality engineering solutions for all drinking-water and food-grade hoses.


Automation and
Pneumatic Components 6


Hoses for
Food Processing 7

APSOplast®
Engineering Plastics Technology

High-tech products made from materials that meet all of the relevant food industry standards.


Semifinished
Products 8


Finished Products
(i. e. Plastic Disks) 9

APSOdrive®
Drive Technology

Mechanical and electrical drive solutions for smooth operation along the conveyer belts.


Belt Drives, Pulleys 10


Actuators 11


Transport Belts 12

APSOvib®
Antivibration Technology

Features a broad product line specifically designed to dampen vibrations and minimize noise emissions.


APSOPUR®/ECOVIB®
Damping Mats 13


Gas Springs 14


Round Buffers,
Machine Mountings 15

APSOdrive® solutions – creative and reliable For many years now, Angst + Pfister has been proving itself as an eminently competent partner for SchmidTech GmbH, whose business includes designing consistently high-quality machinery for the packaging and food and beverage industries. It takes innovative spirit to develop a new, practically maintenance-free filling and sealing machine for the food sector that can be reconfigured for different applications with just a miniscule expenditure of time and money. Angst + Pfister supplied inspiring ideas for a machine that distinguishes itself from other solutions through its unparalleled range of deployment possibilities.

SchmidTech GmbH headquartered in Dussnang, Switzerland, is a progressive, forward-looking company that shares a common goal with its customers: to deploy machines and production lines that prove their worth daily and guarantee smooth-running operations. The multifarious possibilities in drive and engineering plastics technology enabled Angst + Pfister to make a vital contribution to the development of a new filling and sealing machine for products such as yogurt and dairy drinks, thus demonstrating once again that innovative ideas can set new standards.

Innovation for a long-established procedure A filling and sealing machine transports packing units – yogurt containers, for example – that are first disinfected, then filled and finally sealed and dated. As they make their way down the production line, the containers are propelled forward in a set rhythm and are accurately positioned at each station. Where is the potential for innovation in a procedure that has already been established for years? The innovative thinking starts at the spot where the machine is designed to accommodate different products.

Angst + Pfister proposed a timing belt drive for the filling and sealing machine because timing belt drives – as you will soon discover – offer advantages over conventional chain drives, particularly in the food industry. Normally, the flights that are responsible for propelling and positioning the containers are welded to the timing belt. Retooling a machine for a different product thus necessitates switching out the timing belt, which is a tedious and costly undertaking when many different products are involved. The APSO drive® solution developed by Angst + Pfister addresses precisely this point in the production process.

Angst + Pfister – comprehensive expertise from a single source The situation called for a timing belt that is suitable for the food industry and which distinguishes itself from conventional drives through its exceptional flexibility. Angst + Pfister selected a BRECO® ATN timing belt. In contrast to conventional timing belts, the flights or profiles are not welded to the BRECO® ATN timing belt: The profiles can be quickly and easily switched out – a difference with far-reaching advantages. Equipped with other profiles, the same timing belt can be used to convey a variety of different goods. Since the timing belt does not have to be disassembled in order to change profiles, machine downtimes are reduced to a minimum and production costs drop significantly.

In the next development step, optimum auxiliary components had to be found. Here, Angst + Pfister's internal synergies came into play to their full extent: Angst + Pfister's own engineering plastics technology specialists became involved in the development work. Using polyoxymethylene (POM) profiles specially fabricated by Angst + Pfister, which meet all of the specified requirements, our plastics engineers presented a sophisticated APSOdrive® solution that, in addition to the profiles, tied in other components of the filling-and-sealing machine such as hoses and plastic elements. An impressive package was put together: Angst + Pfister developed a complete solution "from under one roof" for SchmidTech GmbH that precisely orchestrates all of the components utilized.

Angst + Pfister developed a complete solution "from under one roof" that precisely orchestrates all of the utilized components.

Maintenance-free in the food industry It goes without saying that both the BRECO® ATN timing belt and the plastic flights that Angst + Pfister specially designed for SchmidTech GmbH meet FDA approval standards. It also goes without saying that the tension members in the timing belt are made of stainless steel and are suitable for contact with food. But Angst + Pfister has played an additional trump that predestines the APSOdrive® solution for use in the food industry: The system developed is entirely maintenance-free. In contrast to conventional chain drives, the timing belts do not need to be lubricated – an essential advantage for deployment in the food sector. But the advantages do not end there. Chain drives have to be retensioned at regular intervals. That retensioning requirement as well is completely eliminated by the timing belts with stainless steel tension members employed in the APSOdrive® solution.

A creative alliance Throughout the entire development phase for the new filling and sealing machine, Angst + Pfister worked closely together with SchmidTech GmbH. This special partnership enabled an innovative concept to come to fruition. The result is an APSOdrive® solution that leaves the standard solutions available on the market far behind.

SchmidTech STFVM-3500 filling and sealing machine

Special features:
- small space requirement, very user-friendly
- completely rust-proof
- disinfection of packaging material
- closed production chamber flooded with sterile air
- closed CIP-capable 2-piston dosing (FDA compliant)
- integrated automatic cleaning of format parts
- cantilevered cup holders enable fast and easy format changing
- up to 12 work stations
- flexible and quiet-running thanks to servo drives

Output:
- 2-track for container sizes up to 1 kg with a maximum throughput rate of 3,500 units per hour

We will be happy to explain to you personally how your company can benefit too from our experience and interdisciplinary know-how.

BRECO® is a registered trademark of Breco Antriebstechnik Breher GmbH + Co.

BRECO® ATN timing belt: the profiles can be quickly and easily switched in and out – a difference with far-reaching advantages. The same timing belt can be used to convey a variety of different goods.

Accurate timing belts perfectly positioned for the packaging industry

Rychiger AG develops and manufactures machines for the production of coffee and tea capsules. The prefabricated capsules must be moved into exact position at individual processing stations such as filling and sealing stations. The use of custom-made timing belts designed by Angst + Pfister makes it possible to meet these precise positioning requirements.

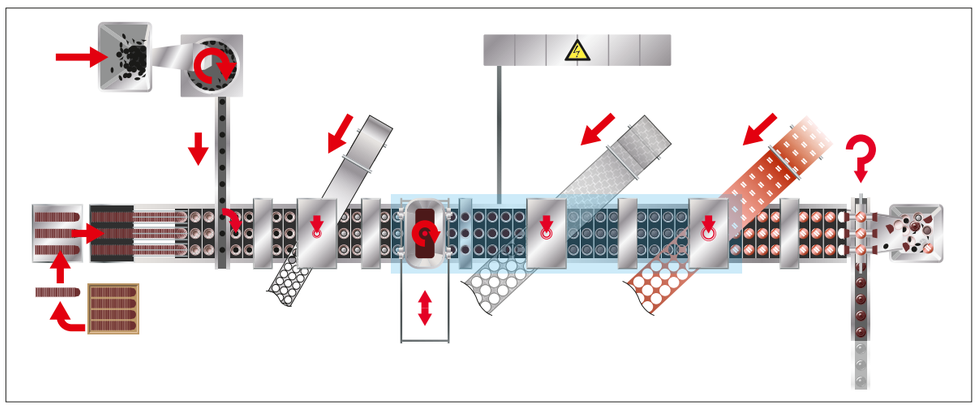
State-of-the-art machines for the filling and sealing of prefabricated capsules and customized solutions for complete packaging processes are the core competency of Rychiger AG. The company based in Steffisburg, Switzerland, is one of the world's leading suppliers in this field. Rychiger AG has been fully meeting customers' high demands for many years now, with a product range that is always at the cutting edge of new technology. Intelligent selection of materials and profound technological know-how form the foundation of the company's success. The use of innovative barrier materials such as multi-layer plastics or aluminum combined with precision filling and sealing technology guarantees safe, durable and customer-friendly packaging for Rychiger AG's clients.

A key success factor in the development is Angst + Pfister's early involvement.

Timing belts – from station to station with millimetric precision Coffee capsule systems have quickly become bestsellers. The Rychiger FS 910 assembles, fills and seals prefabricated capsules of all types. The machine, designed for dry cleaning, built around five modules that can be combined and supplemented with other modules or functions as needed. Custom-made timing belts from Angst + Pfister measuring up to 20 meters in length transport the capsules from station to station through the machine and ensure ultra-precise positioning.

Thanks to light- and air-tight barrier materials and nitrogen flushing of the capsule contents, the fabricated capsules without environmental packaging materials have a shelf life of up to 12 months. The capsules are put through a series of production steps as they are moved through the machine on carrier plates. Up to 1,440 capsules with a diameter of 37 millimeters can be filled per minute.

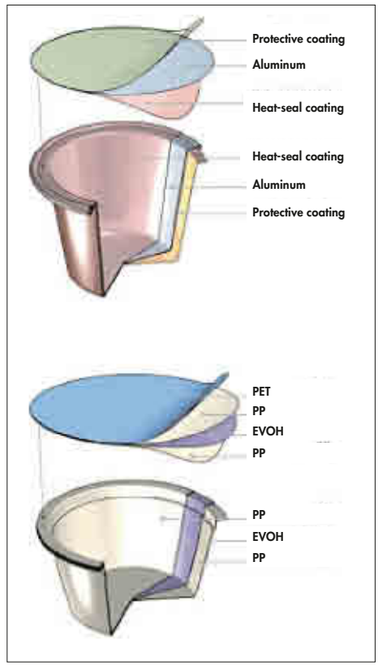
Expectations fully met The conveyance system for the unusually long machine had to meet high expectations with regard to positioning and linear precision. The wish to position capsules at different manufacturing step stations simultaneously with a single conveyor element presented the engineers with a great challenge. Initially, an attempt was made to achieve the required rigidity with welded standard timing belts. In order to circumvent weak points in the welding and splicing inaccuracy, Angst + Pfister divided a BRECO® 50 AT20 timing belt into two 25-millimeter-wide belts and then welded these to the required length of 18,720 millimeters. Afterwards, the belts were also welded laterally so that the belt connection was staggered by 180 degrees. The positive result was a significant increase in strength and stiffness in the critical area.



Capsule manufacturing step sequence.

Custom-made BRECO® timing belts from Angst + Pfister measuring up to 20 meters in length transport the capsules from station to station through the machine and ensure ultra-precise positioning.

Attachment of capsule carrier plates to the timing belt.

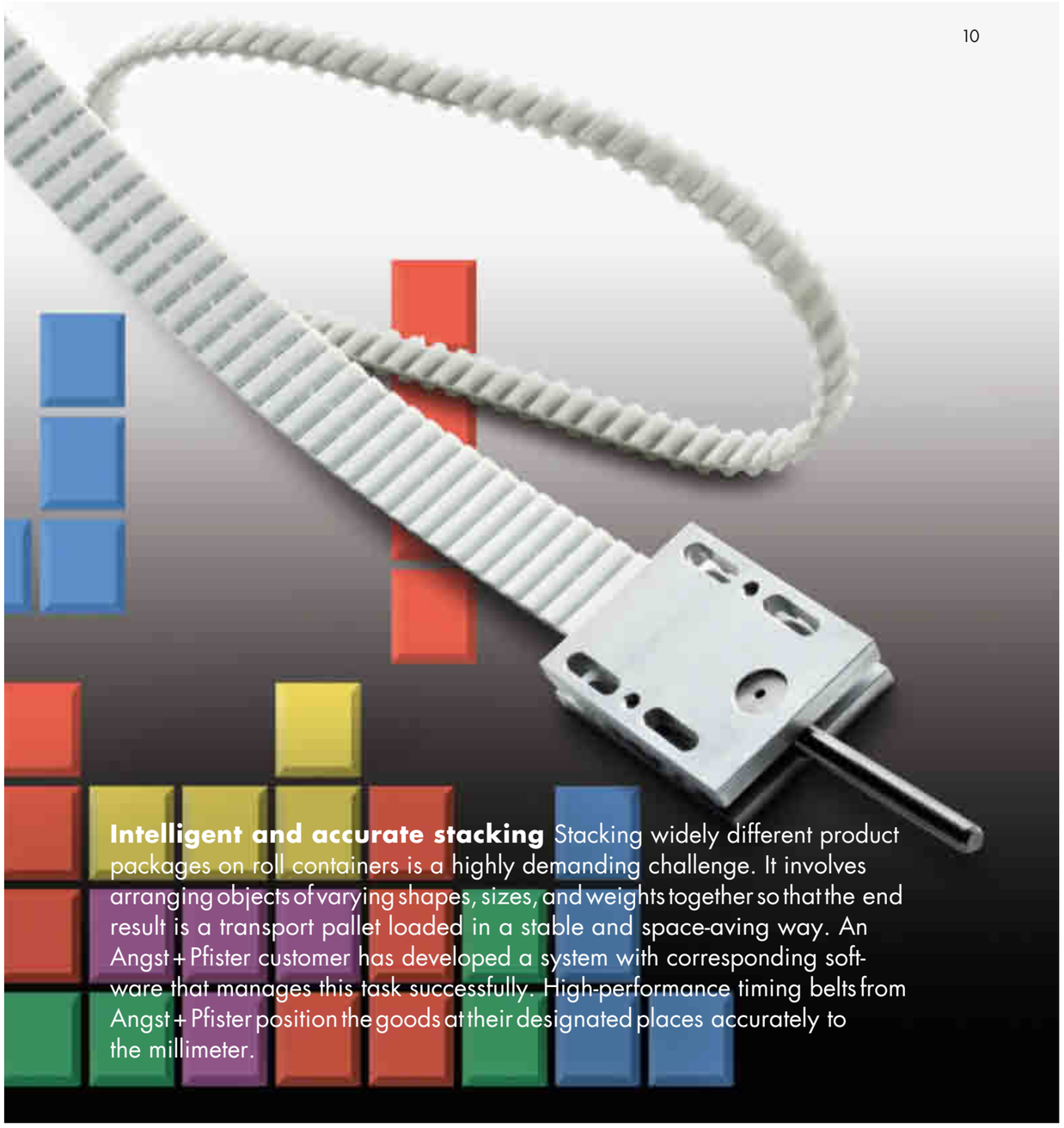


Structure of capsule systems.

Focused expertise At the same time, the accuracy of the partition in the AT20 profile could be doubled by staggering of the belts. To achieve optimum coherence of the two belts, the back of the belt was ground down to the steel reinforcement and reextruded with a polyurethane surface. Two BRECO® 50 AT20/18720-V timing belts of this type that are manufactured in pairs are employed in the Rychiger FS 910. They move the capsule carrier plates that are perpendicularly attached to them safely and reliably through the entire machine. The close collaboration between Rychiger AG's skilled engineers and Angst + Pfister's drive technology experts resulted in a highly efficient, reliable and economically feasible solution. The deciding factor for this excellent outcome was the early combination of technological and solution expertise into a productive joint development team.

Diversity with guaranteed longevity Angst + Pfister's timing belts meet our customers' highest demands and can be adapted to any application in accordance with the construction specifications and deployment conditions. A wide variety of materials, special steel cord designs and diverse coating options are available, and there is also the possibility of mechanical finishing. For conveyance and transport tasks, the high-quality drive elements are also available with welded on or bolt-on flights, while internal steel cable reinforcements provide high load capacity. Moreover, the use of polyurethane as a substrate also makes the timing belts extremely abrasion-resistant and thus especially durable.

Engineering and experience – a strong team Application-specific solutions in the field of drive technology are one of Angst + Pfister's great strengths. Our drive technology experts will be glad to consult with you on-site. Or simply tell us the parameters of your individual application and our engineering team will pull out all the stops to develop an ideal solution for you.



Intelligent and accurate stacking Stacking widely different product packages on roll containers is a highly demanding challenge. It involves arranging objects of varying shapes, sizes, and weights together so that the end result is a transport pallet loaded in a stable and space-aving way. An Angst + Pfister customer has developed a system with corresponding software that manages this task successfully. High-performance timing belts from Angst + Pfister position the goods at their designated places accurately to the millimeter.

SYNCHROFLEX® 16 T10/720-DL and BRECO® 32 AT10 with clamping plate.

Supermarkets have to contend with a very diverse array of packing units. Everything has to be delivered neatly palletized, even if the range of packages extends from beer crates to shampoo bottles shrink-wrapped in various ways. Aficionados of the TETRIS computer game, where the goal is to form stacks with as few gaps as possible from building blocks of various shapes and sizes, will clearly see the analogy. For applications of this kind, the Angst + Pfister customer developed and built an Universal Mixed Palletizer (UMP).

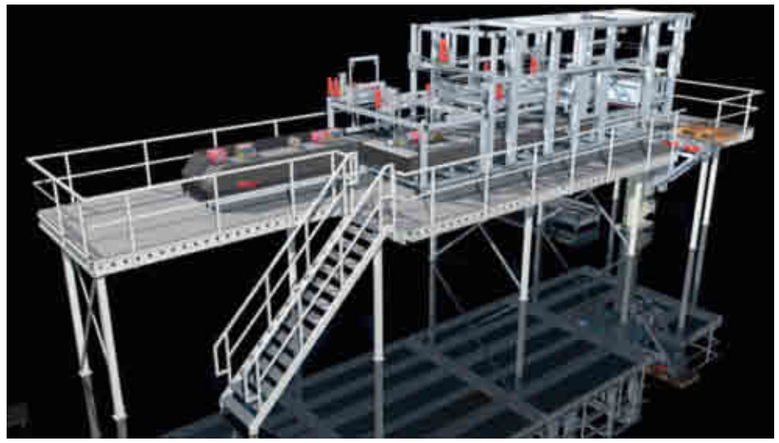
For accurate and stable stacking The UMP is a construction capable of automatically stacking or palletizing goods in a wide range of formats and forms, packaged in many different ways, with high performance. By performing accurate and stable stacking, it is able to load pallets and roll containers without human intervention. The system enables substantial personnel cost savings, faster delivery execution and a reduction of error rates. It is not unusual for supermarket chains to carry 3,000 different items in their product assortment. In real-life application in this area, the UMP works in conjunction with an Intelligent Storage System (ISS). Packing units coming from the central warehouse are positioned ready for call-up on 1,450 buffer conveyors of the ISS.

Interesting applications for timing belts In their search for optimal solutions for demanding drive and positioning challenges within the system, the development engineers made use of the experience and expertise of Angst + Pfister's specialists. This resulted in a number of interesting applications for timing belts from the Angst + Pfister product range. For example, a cassette is mounted on a buffer conveyor of the ISS with a double-toothed, extra wear-resistant and specially reinforced SYNCHROFLEX® 16T10/720-DL timing belt fastened within. The supply belt for the ISS is positioned as a buffer conveyor using a BRECO® 32 AT10 timing belt. The belt pulley of the supply belt inside the cassette is driven by a servo drive. One packing unit is placed on the supply belt with every drive cycle. This design helped limit the deployment of expensive servo motors, resulting in a significant cost reduction.

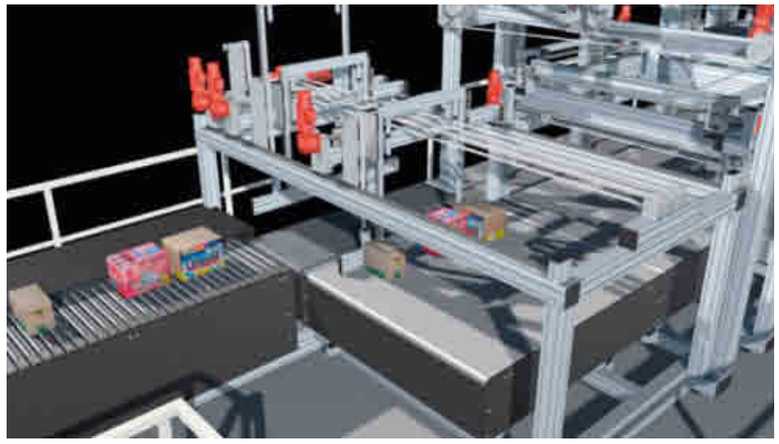
Products in perfect formation The products on the supply belt leading to the UMP differ in terms of their measurements, their weight, and above all, their shape. They are grouped in layers for the stacking process. With the help of pushers, they are aligned correctly and then special arms place them into a rectangular contour that corresponds to the pallet's or roll container's dimensions. In the next stage, the formations created this way move on to the stacking section. A so-called magic box that surrounds the formation and holds it together is placed over the products lying on fork carriers. The forks are then retracted so quickly that the products cannot move sideways because of their inertia, and they drop onto the pallet as an intact formation.

After each layer, the lift apparatus is repositioned so far downward that the next layer can be stacked on top. Product packages are selected and arranged in such a way for this layer that they offset any height variations in the layer beneath.

In this way, a pallet or roll container is filled step by step and finally removed. In a following step, the next pallet or roll container is moved in for stacking using a second lift apparatus. The vertical movements of the lift apparatuses are also actuated using BRECO® and BRECOFLEX® timing belts from Angst + Pfister.



Universal Mixed Palletizer (UMP).



Supply belt with widely varying goods.

From simple to sophisticated: The timing belts from Angst + Pfister and their components are well suited for all functions in the driving, positioning and transport areas.

In the course of a joint pilot project, the Universal Mixed Palletizer, the Intelligent Storage System and a Vacuum Lifter were installed in a distribution center of a supermarket chain. The first fully automated order-picking system became operational soon afterwards in the supermarket chain's newly built central warehouse. The supermarket chain was enabled to increase its logistics efficiency considerably.

The proven SYNCHROFLEX®, BRECO® and BRECOFLEX® series timing belts and the corresponding components such as pulleys, clamp connectors and tension wheels are well suited for all functions – from simple to sophisticated – in the driving, positioning and transport areas.

Timing belt brings butter into shape Butter in a trapezoid shape instead of the conventional rectangular form is a welcome creative change of pace. The slanted edges of the new shape make folding the butter wrapper in the packaging machine much more complex. The highest demands are thus placed on the sequence of movements in the folding station of the innovative MSW200 wrapping machine made by SchmidTech GmbH. A PUR high-performance timing belt from Angst+Pfister is used as an accurately positioning, compact, wear-resistant and low-noise drive for the folding wheel, which plays a key role in this packaging process.

© Photo: Yelena Yemchuk, www.istockphoto.com

SchmidTech GmbH in Dussnang, Switzerland, is an innovative, independent company specialized in the development, manufacture, installation and maintenance of machines and systems primarily for the production and packing of butter and margarine. The company is proud of its innovative MSW200 molding and wrapping machine for butter, margarine and other products with similar viscosity. The very easy to operate, high-performance parallel processing machine carries out every work step on two sticks of butter simultaneously.

Complex folding procedure A special highlight of this machine is its 3-D folding station, which is designed in a way that enables the machine to wrap rectangular as well as trapezoid shaped sticks of butter. This means that the folder must be able to move in three dimensions. Folders are tools that are automatically guided by arms to the pieces of butter to be wrapped, fold the wrapping foil along the edges of the product and smooth it along the surfaces. The core of the folding station is the folding wheel, inside of which the sticks of butter are synchronously guided and precisely positioned at the various folders.

Originally, the individual wrapping steps were performed using a globoid gear with disc carriers and a central shaft. SchmidTech GmbH sought out a more flexible solution in view of the change in format of the product to be wrapped. It was also looking for a wrapping solution that would operate with less noise, require less space and cost less to manufacture.

Successful cooperation The collaboration between SchmidTech and the drive technology specialists at Angst+Pfister resulted in a servo drive with a SYNCHROFLEX® 50ATP15/1560 PUR timing belt. The 50 mm wide and 1,560 mm long timing belt with 15 mm tooth spacing is propelled by a 32-tooth drive-side-synchronized pulley and drives the gearwheel via a synchronized pulley with 30 teeth.

The SYNCHROFLEX® ATP timing belt with 15 mm tooth spacing as well as the configuration of the timing belt pulleys that drive the folding wheel were selected mainly on the basis of the following criteria:

- very high power transmission
- high positioning accuracy
- rigid drive
- low noise emission

Pulley-shaft connection with cylinder tensioning element.

Compared to the original solution with the globoid gear, the combination of servo drive and SYNCHROFLEX® ATP timing belts offers the following main advantages:

- optimized tact cycles
- less wear on the power train
- more compact machine design thanks to the space-saving power train
- easier, faster format changes
- high productivity: wrapping speed for butter units up to 250 grams: rectangular shape: 200 units per minute trapezoid shape: 50 units per minute

Top-quality timing belts SYNCHROFLEX® ATP high-performance timing belts are made of wear-resistant polyurethane and fortified with flex- and strain-resistant load-bearing steel cords. Their unique patented tooth profile is a noteworthy feature. The subdivision of each tooth into two load-bearing partial teeth optimizes force transmission, tension distribution and tooth engagement, and reduces the polygon effect. At any rpm, SYNCHROFLEX® ATP high-performance timing belts are 60% more efficient and up to 10 dBA quieter than conventional timing belts. Their service life is up to 100% longer.

Their superior performance efficiency enables the belt width to be reduced by up to 60% compared to conventional belts for a given application. By using narrower pulleys and thereby reducing space requirements, more compact machines can be constructed and significant cost reductions can be achieved.

In addition to SYNCHROFLEX® ATP high-performance timing belts for the power train of the folding wheel, the SchmidTech GmbH MSW200 molding and wrapping machine also employs various BRECO® timing belts from Angst+Pfister for handling and transport functions.

Use the reply card to order our documentation on SYNCHROFLEX® ATP high-performance timing belts.

Inventive packing with little friction In supermarkets, a continual battle rages for the best spot on the shelf. To capture a prominent position on congested shelves, what's needed is attractive packaging that sets a product apart from the others. Innovative machines are needed to manufacture such packaging. These machines must combine high performance with flexibility, simple servicing and – last but not least – a return on investment. For more than 50 years, PMB UVA International has specialized in producing packaging machines that offer these advantages.

Nowadays, packaging isn't designed with just convenience and hygiene in mind; it's also a marketing tool. "The cheaper the product, the more important the presentation of the bag," explains Harrie Schonewille, Managing Director of PMB UVA. "Classy packaging induces the consumer to place a greater value on the bag's contents."

A team-up of two leading machine builders stands behind the PMB UVA name. PMB manufactures cigar-making machinery while UVA specializes in vertical packaging machines. For more information, visit www.pmb-uva.com.

Upright packaging, better presentation The packaging industry is inventive, and the advertising world takes advantage of this. Edge seams give packaging stiffness. Resealable strips enhance convenience and product freshness. A "block bottom" is a flat bottom that enables the product to remain standing upright.

Packaging is increasingly being utilized as a presentation tool. One trend in packaging is the Doypack or stand-up pouch. When one compares this with other packages lying jumbled in a bin, the presentation value of such orderly, vertically standing and thus eminently readable packaging maximizes the consumer impact.

One machine, different bag forms Consumer behavior is fickle and unpredictable. Something can be hot today and passé tomorrow. PMB UVA has developed a forming, filling and sealing machine that is capable of producing different types of bags ranging from simple potato chip bags to complicated block bottom bags with resealable openings. These machines now also offer the unique innovation of being able to produce Doypacks as well. The new machines are ideal for manufacturers who want to respond quickly to mutable consumer preferences. "Different customers need this flexibility," says Roy van Hoof, a machine engineer at PMB UVA. A big advantage of the Newton 400 TX is that adding additional functions hardly increases changeover times. "Two to three minutes," estimates head engineer van Hoof.

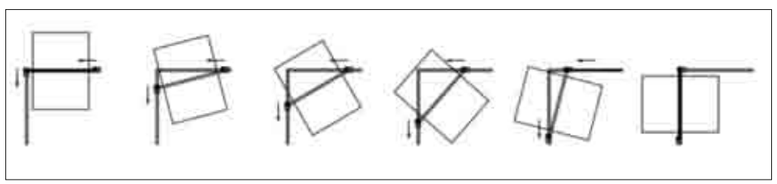
APSOplast® PET-C SL is the ideal material for highly stressed slide bearings. It is particularly recommendable when lubrication is undesired.

Those who deal with innovation face challenges. A standard guiding block made of plastic was unable to withstand the surface pressure of a nearly 100-kilogram set of cross-seal jaws. A sufficiently stiff and hard plastic with a low sliding friction coefficient might be just the thing to remedy the problem. PMB UVA thus went looking for a plastics specialist and immediately thought of Angst + Pfister because Angst + Pfister had already demonstrated its expert knowledge in the past and was currently delivering good results in its work with PMB UVA in the area of drive belts.

Guiding block made of the plastic APSOplast® PET-C SL.

Newton 400 TX packaging machine.

The technology In order to produce Doypacks with the Newton machine, the cross-seal jaws have to be rotated 90 degrees. The machine must be easy and fast to convert to be able to continue producing other types of bags. The jaws are rotated by means of parallel shifting along the XZ plane, as shown below.



In order to make this process as simple as possible and to ensure fast cleaning, PMB UVA decided on a straight stainless steel strip over which a plastic guiding block is slid.

Design challenges:
- low sliding friction coefficient, even in dry operation
- ability to withstand high pressure;
- good machinability

Angst + Pfister's solution based on APSOplast® PET-C SL meets these requirements. APSOplast® PET-C SL is the ideal material for highly stressed slide bearings. It is particularly recommendable when lubrication is undesired but at the same time a long service life of the slide bearings is necessary.

The advantages of APSOplast® PET-C SL are:
- very low sliding friction coefficient, even in dry operation
- very hard and wear-resistant
- tight machining tolerances possible
- dimensional stability
- complies with FDA standards

APSOplast® PET-C SL can be delivered as a ready-to-use part (machine cut) or in the form of semifinished plates and round bars in different sizes.

You too can utilize the advantages of modern slide bearing materials. Angst + Pfister would be happy to advise you in selecting the right material.

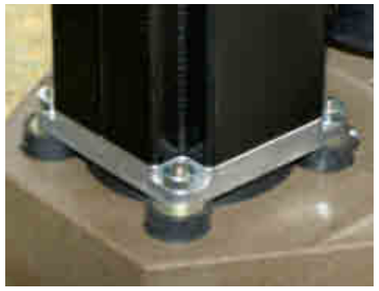
APSOvib® solutions – no cold coffee – Angst + Pfister round buffers in professional coffee machines Everyday we encounter round buffers virtually everywhere, but they usually go unnoticed. Round buffers from Angst + Pfister work behind the scenes to ensure smooth functioning of a vast array of different machines by suppressing undesired vibrations and noise. But be careful: Not every round buffer is suitable for every extreme condition! To avoid a rude awakening, the experts at Angst + Pfister help you in the early planning phase to find the ideal round buffer for your application. Angst + Pfister, for example, has developed a heat-resistant round buffer capable of withstanding the severest of strains for Cafina, the renowned Swiss manufacturer of professional coffee machines for the restaurant industry.

The aroma of freshly ground coffee beans and the enticing sound of foaming milk are an intrinsic part of the ambience of a cozy afternoon in a coffeehouse – the rumbling of a poorly insulated motor or the stench of overheated rubber definitely are not. In close collaboration with the manufacturer Cafina, Angst + Pfister thus developed the ideal round buffers for installation in large coffee machines for the restaurant industry. The fully automatic Cafina coffee makers can be found in many popular cafés and in major restaurant chains and hotels like the famous Kempinski in St. Moritz, Switzerland.

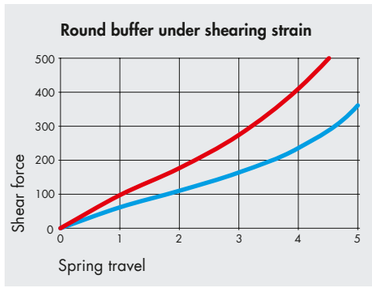
Exacting demands... Together with the engineers at Cafina, Angst + Pfister's antivibration technology experts employed a sophisticated testing procedure to ascertain the demands that the newest generation of coffee machines – the Cafina ALPHA line – places on its components. The "heart" of the coffee machines is their brewing chamber. There, freshly ground coffee is compressed by a piston, then highly pressurized hot water is forced through the coffee grounds and the brewed coffee flows directly into the cups. This piston is driven by a stepper motor that is mounted on four small round buffers.

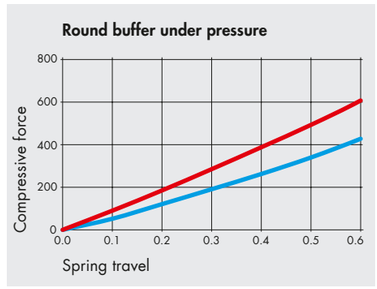
The round buffers serve to elastically suspend the drive motor and to suppress its vibrations so that the coffee machines run as quietly and vibrationless as possible. At an operating temperature of 60 °C and peak temperatures of up to 80 °C, resistance to heat is the main challenge that all coffeemachine components must meet. In the case of the Cafina ALPHA line, the round buffers must guarantee proper functioning even at high temperatures.

... require well-thought-out solutions... In a special series of tests, the engineers at Angst + Pfister documented how the spring characteristics of the rubber-metal buffers change at high temperatures. An exactly calibrated composite mixture of EPDM and CR emerged as the ideal material combination. EPDM stands for ethylene propylene diene M-class rubber and CR stands for chloroprene rubber, which is also called neoprene. EPDM is well-known for its excellent thermal resistance properties. The test results were immediately put into practice: Today Angst + Pfister supplies the Cafina company with custom fabricated round buffers that are optimally adapted to the Cafina ALPHA line of coffee machines.



Custom-fabricated round buffers from Angst + Pfister for the Cafina ALPHA models.





... and reliable quality assurance To guarantee maximum long-term quality, Angst + Pfister rigorously inspects and tests the finished round buffers before they are shipped to the customer. Even in the area of quality measurement, Angst + Pfister is setting new standards: Instead of simply measuring hardness using the Shore method, our engineers have developed a new system that enables the load deflection curves for compressive and shearing strains on Angst + Pfister round buffers to likewise flow into the hardness rating. Spring characteristics are thus distinctly verifiable even for tiny workpieces. A special clamping device was specifically constructed to record these load deflection curves.

Quality down to the tiniest detail Complex processes can only function smoothly when all individual components are 100% reliable. We therefore take our customers' wishes very seriously and work together with them to devise the optimum solution for each specific application. Drawing on our close collaboration with manufacturers like Cafina and the resulting empirical experience, Angst + Pfister has developed a specifications checklist for customized antivibration technology components. With this checklist, a little information is all we need to fabricate exactly suited components for you.

Using this specifications checklist, we can rapidly and reliably analyze which industrial components are suitable for your specific application. Our engineers define the precise requirements for all materials, the maximum allowable strains, potentially necessary treatments – for surface protection for example –, as well as the requisite spring characteristics, dimension measurements and tolerances for all components. We prepare an exact fabrication drawing in coordination with manufacturers and customers, and we provide you with test documents as well as shipping and installation instructions.

Specifications checklist

- Installation drawing
- Standard and peak strains
- Required vibration isolation
- Operating temperatures, peak temperatures
- Desired corrosion protection, resistances
- Scope of application
- Intended service life of the machine in which the round buffers are to be installed
- Special demands placed on the components

The APSOvib® buffer assortment has been completely restructured so that customers will now be able to find the right product even more quickly. Selection is also made easier thanks to a consistent declaration of key data.

Don't hesitate to consult with our antivibration technology specialists about your application and to take advantage of Angst + Pfister's experience, comprehensive expertise and innovative spirit!

The new Cafina ALPHA puts coffee enjoyment at center stage.

Silicone hoses – frying without risk Fryer oil 70 degrees Celsius hot is dangerous for the person who is handling it. In awareness of the burn risks for kitchen personnel, the Angst+Pfister engineers, in close collaboration with one of their customers, developed a system for changing fryer oil that employs a UNISIL™ silicone hose. This solution is as safe as it is easy to use, and it was embraced enthusiastically by kitchen staff.

Fryers are welcome fixtures not just in the kitchens of employee cafeterias, restaurants and fast-food outlets, but also in the haute-cuisine sector.

The system used to change fryer oil is very important because fryer oil must be changed regularly. In the case described in this article, this was previously done by means of a drain valve connected to a rigid pipe. The waste oil was drained into a catch container, which was then emptied by hand into a metal drum. This task was very dangerous because the container was very heavy and the oil was hot. In its quest for a better solution, the customer turned to Angst+Pfister. Both companies had already been working closely together for years and maintained excellent relations. So it was only natural that the company decided to involve Angst+Pfister in the project to optimize the oil-changing system.

After studying the specification book, it was decided to attach a hose to the back side of the fryers. The hose not only had to be flexible, but also FDA-compliant, resistant to fryer oil at a temperature of +70 °C, easy to clean and simple to handle. It goes without saying that handling safety was the top priority.

The solution: an emptying and filling unit The system proposed by Angst+Pfister consists of an emptying and filling unit composed of an UNISIL™ silicone pressure hose and an inlet bend with an integrated pipe. The hose is equipped at both ends with quick-release couplings. The unit enables oil to be drained from the fryer well without risk. The hose assembly is attached to the fryer well, and the oil is pumped out of the fryer by means of a practical manual control mechanism affixed to the inlet bend. This new system eliminates having to handle the hot catch container. The emptying and filling unit can also be used to rinse the interior walls of the fryer well and the heating element. Reusable oil is pumped back into the fryer well. Waste oil can be pumped directly from the fryer well into an external container using the same system. At the end of the oil-changing process, only the emptying and filling unit needs to be disassembled and cleaned.

The hose is stowed away practically.

Press-fitted stainless steel rings instead of hose clamps.

The fryer well is rinsed and filled.

The hot oil is pumped out of the fryer.

The UNISIL™ silicone hose is not only FDA-compliant, but is also tasteless, odorless and heat-resistant to temperatures up to +180 °C (or brief temperature spikes up to +250 °C). In addition, it is easy to clean and simple to handle because its exterior surface is smooth. The sleeve of the quick-release coupling is equipped with a stop valve and is thus completely dripless.

The UNISIL™ silicone hose is not only FDA-compliant. It is also tasteless, odorless and heat-resistant to temperatures up to +180 °C, in addition easy to clean and simple to handle.

Minimum of components – minimum of costs The number of components in this system is kept to a minimum to ensure easy handling and to minimize costs. Angst+Pfister proposed a hose with press-fitted stainless steel rings because hose clamps can injure operating staff and might damage the hose. The pressfitting was performed by experienced technicians in Angst+Pfister's workshops. The customer thus benefitted from traceability of the pressfitting and consistent quality of the end product.

The new oil-changing system presented a very good value proposition. It is dependable and safe, and it was thus also highly regarded by the end users.

Thermal resistance, good electrical insulating properties The UNISIL™ silicone hose has a wide array of uses. Its excellent thermal resistance and good electrical insulating properties make the hose very suitable for conveying water in the vicinity of induction stoves. It is also readily used in industrial refrigeration and in the food industry because the UNISIL™ hose also conveys hot air very well.

UNISIL™ is a trademark of Angst+Pfister.

TPE hoses – so that shape and performance are correct

In order to relieve kitchen staff of the job, the newest generation of fully automatic cooking devices manufactured by Rational AG clean themselves. Precisely shaped hoses play an important role in the fully automated cleansing process. Shaped hoses from Angst+Pfister meet the high requirements for use in restaurant and catering operations because they are optimally adapted to tight space conditions and comply with hygiene and thermal specifications.

Final assembly.

Rational AG, headquartered in the Bavarian town of Landsberg, has been focusing on developing technologies for thermal food preparation for approximately 30 years. Its systematic research and pathbreaking inventions have made the globally active company one of the market leaders in its field, with the highest name recognition in the sector. Moreover, 100 of Rational AG's roughly 880 employees are chefs who understand users' needs and competently assist them in solving their food preparation problems.

Keep it simple With the invention and successful launch of the SelfCooking Center®, Rational AG's technology has established itself as a world standard. The SelfCooking Center® relieves the cook from overseeing the cooking process and thus frees him from many routine tasks that were once unavoidable. This enables him to concentrate on the essentials, namely quality and creativity. The technology developed by Rational AG replaces approximately 40 to 50% of all traditional cooking devices in a professional kitchen.

Cleaning without risk The cleaning process is as simple and secure as the cooking process. At the touch of a button, the cooking devices clean themselves fully automatically overnight, ensuring sparkling and flawless hygiene. The user can choose between three self-cleaning processes with different temperature sequences. Specially developed detergents and rinse agents are employed, and they guarantee economical consumption of resources by means of an innovative wash liquor circulation principle.

The entire range of SelfCooking Center® equipment for stress-free food preparation.

Shaped hoses made to measure Each device is equipped with three different hose types manufactured to drawing. Their shape has been adapted to fit tight spaces. They compensate potential assembly tolerances and thermal expansion of rigid components, and prevent transmission of vibrations from moving components to the cooking device. Flexible connections enable easy assembling and dismantling of components in tight installation spaces. The three different types of hoses perform the following tasks:

- suction hose: suction and circulation of wash liquor consisting of detergent, rinse agent and water
- pressure hose: feeding and circulation of the wash liquor
- steam hose: conveys the steam created by the steam generator at temperatures up to +95 °C, as well as the condensate

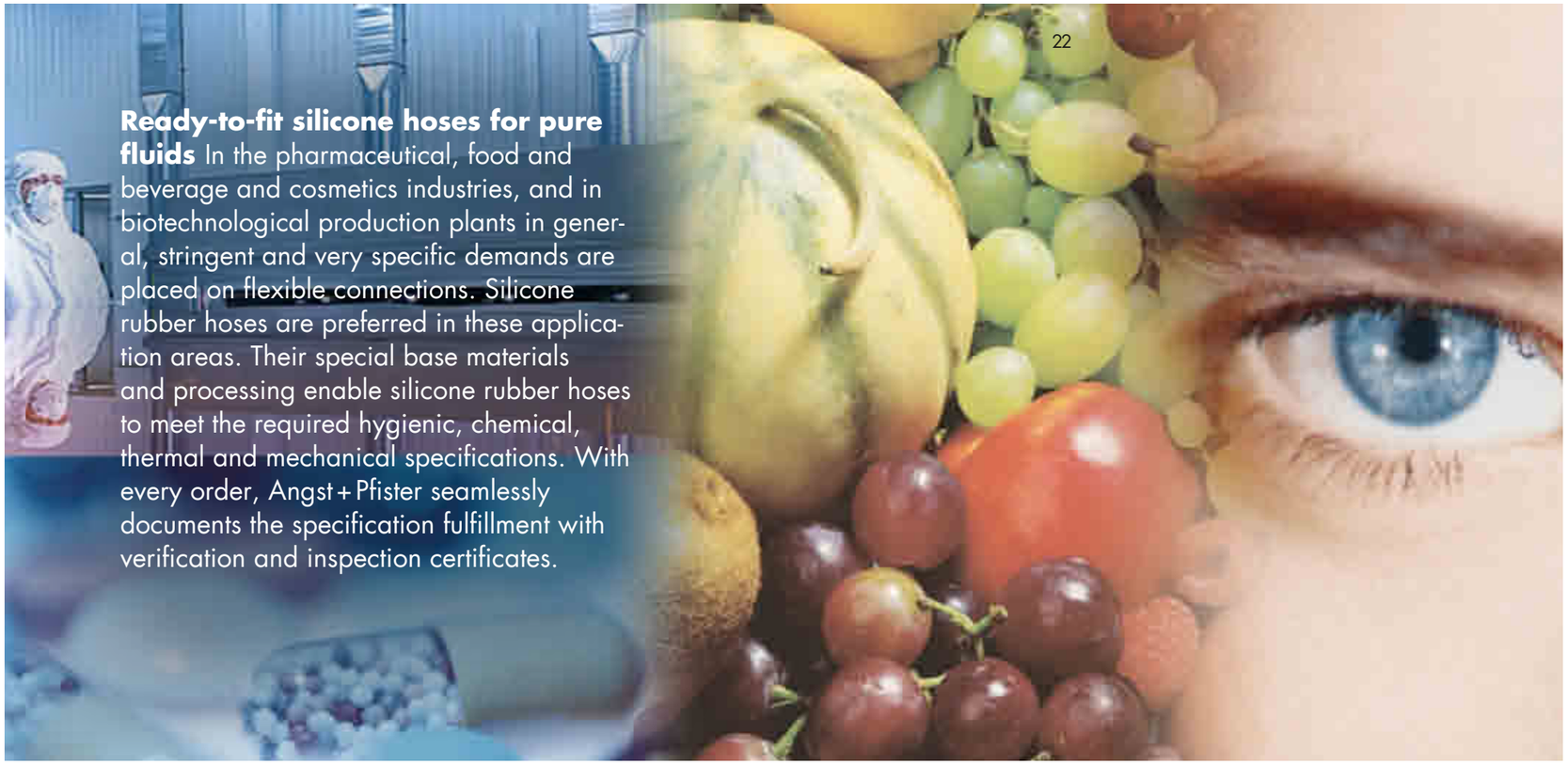
Compliant material The TPE (thermoplastic elastomer) quality specifically defined for this application, coupled with the customized fabrication, optimally fulfills the requirements:

- internationally suitable for use in the food industry
- heat-resistant for use with steam
- universal chemical resistance
- elastically distensible and bendable

Dual-layer shaped hoses made of TPE.

Joint development The development of a total of 15 shaped hoses for the different types of cooking devices took place in close cooperation between Rational AG and Angst+Pfister. From working out the basic geometry to manufacturing the finished dual-layer formed hoses in their complex shapes, partly also with diameter extensions, several steps with interludes of practical testing needed to be undertaken.

The specialists at Angst+Pfister paid particular attention to streamlining production while taking into account the number of units to be manufactured. Angst+Pfister delivers the components directly to the production line and stands in direct contact with the assembly foremen in the manufacturing cells.



Ready-to-fit silicone hoses for pure fluids In the pharmaceutical, food and beverage and cosmetics industries, and in biotechnological production plants in general, stringent and very specific demands are placed on flexible connections. Silicone rubber hoses are preferred in these application areas. Their special base materials and processing enable silicone rubber hoses to meet the required hygienic, chemical, thermal and mechanical specifications. With every order, Angst+Pfister seamlessly documents the specification fulfillment with verification and inspection certificates.

The pharmaceutical, food and beverage, cosmetics and biotechnology sectors all have something in common: They produce or process substances intended for direct or indirect consumption or that otherwise come into close contact with living beings. Hoses and flexible tubing for these application areas must therefore conform to stringent national and international regulations, specifications and guidelines. Moreover, there are also pure or otherwise sensitive fluids that must not be contaminated or altered during pumping. Prescribed routine cleaning and sterilization processes put additional stresses and strains on flexible connections.

Even individual markings on the tubing can be supplied at the customer's request, or eventual additional testing can be arranged.

Materials for sensitive applications High-alloy stainless steel, nickel alloys, fluoroplastics like PTFE, enamel and glass are well-known types of materials that meet exacting standards. However, they are often unfeasible for flexible tubing because they lack flexibility, and they are rarely suitable for corrugated tubing because they do not provide sufficient means of emptying and cleaning. Chemical-resistant high-temperature elastomers are often unsuitable for contact with food or incapable of meeting other medical specifications.

This gap is filled by specially developed, high-grade, white- or natural-colored platinum-cured silicone hoses. They meet typical specifications such as:

- compliance with FDA 21 CFR 177.2600 (US Food & Drug Administration regulations)
- compliance with the food regulations of Germany's Federal Institute for Risk Assessment
- compliance with USP Class VI (Pharmacopoeia of the USA)
- compliance with 3.1.9. of the European Pharmacopoeia
- certified verification of conformity with cytotoxicity and hemolysis specifications for medical applications
- suitability for CIP (cleaning in place)
- sterilizability, for example, with saturated steam at +124 °C and 3 bars for a duration of 40 minutes or via irradiation

Connecting fittings Two criteria are decisive for connecting fittings for sensitive fluids:

- best possible dead space freedom, meaning no inaccessible spots and no corners or edges that are hard to clean
- compatibility of materials such as AISI 316 L, also known as material no. 1.4435 or 1.4436

Silicone hose with press-fitted, dead-space-free stainless steel fittings.

Under typical pressure ranges, it does not vitally matter whether press-fit or reusable screw fittings are ultimately used. What's important is the selection of the correct inner diameter, wall thickness and professional processing of the hose.

Documentation of proof On request, Angst+Pfister provides certification, proof of inspection and other verification documentation. Even individual markings on the tubing can be supplied at the customer's request, or eventual supplemental testing can be arranged. To ensure product delivery on deadline, requests for such quality assurance services must be made early on, at the latest when placing the order.

Angst+Pfister is a trusted name for quality The optimal product at the right place in defined and documented quality – that's what Angst+Pfister guarantees. Consult our specialists. They have the knowledge and experience to devise practical solutions to ensure that you have the right flexible connection for the intended application, whether as meter ware tubing or as a ready-to-fit hose system.

Hose data

Nominal widths:	3 to 102 mm
Operating pressure range:	up to 15 bars (depending on nominal width)
Bursting pressure:	4 times maximum operating pressure
Operating temperature range:	–60 °C to +180 °C
Vacuum stability:	90%
Bending radius:	approx. 4 to 5 times inner diameter
Manufactured lengths:	up to 10 meters depending on nominal width and hose version

Meeting the highest industry standards

EC 1935/2004
EC 10/2011

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APSOdrive®
Drive Technology

APSOvib®
Antivibration Technology

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