

PACO

WORLD

Our International
Wire & Mesh Magazine
for Existing and
Prospective Customers

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What Do You Consider Normal?

Dear Reader!

With Paul GmbH & Co having put their big anniversary behind them, things at the company are now getting back to normal. But these days, what do you consider normal?

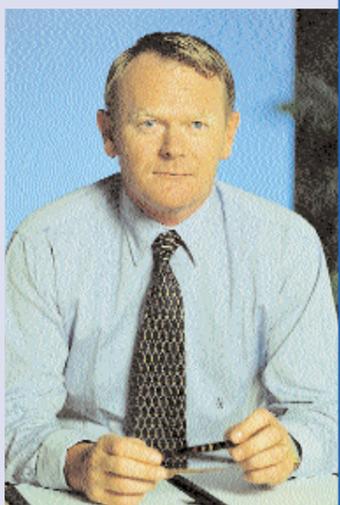
Is it normal that the economies of a number of Third Countries are now running smoother than those in Old Europe or in the New World, the USA? This is a fact of life that we are going to have to get used to!

Is it also normal that the EU suddenly has 10 new member states. All of which are equipped with almost unlimited ambition, dynamically developing economies and extremely interesting market opportunities.

At PACO, we already developed our markets and customer base in Central and Eastern Europe a number of years ago. Regardless of whether it is commonly viewed as normal or not: it doesn't make sense for us as a company to wait and see how others make use of the best chances. This is a policy that we are continuing to pursue in other developing markets such as India and China.

It is, therefore, no surprise that one of the maxims of our company is "never view anything as normal!" For instance, that our customers are satisfied with us, that we remain competitive in the face of global competition or that our employees always do an excellent job. Only keeping alert to the quickly changing business environment and market requirements will make sure that being successful is "normal" in the future.

Best regards
Peter Ruppel
Managing Director



Bubble Trap in the Upper Stage of the Ariane 5: PACO Filters in Space!



The Ariane 5 is the latest member of the successful European launch vehicle family. And PACO is there again – right at the forefront: in the upper stage, that is responsible for precisely settling the satellite and providing the fine tuning for the injection into the transfer orbit, there is a PACO filtering component that has been specially designed for a zero gravity environment.

A small part for a spacecraft, a big success for PACO

For a manufacturer of woven wire cloths and filters based on metal filter media this is, of course, not what can be called a volume market: approximately six Ariane 5 launch vehicles are to be sent into space each year. But it is a very lifting feeling to know that a PACO product is playing its part in commercially developing space flight.

This is further heightened by the fact that the PACO contribution is placed at the very tip of the towering Ariane 5 system: in the tank of the upper stage – the EPS.

Compact bundle of energy with considerable demands

When looked at physically, a rocket is a fairly simple construction: solid or fluid propellant is burnt to provide acceleration. This was a feat that the Ancient Chinese mastered a long time ago. However, to get a rocket into space, a lot more is needed than just thrust. And in the case of a satellite carrier such as the Ariane 5 everything becomes particularly captivating: the upper stage contains the valuable satellite freight that has to be precisely launched into the specified orbit around the earth. This requires a complex drive and control system that has to perfectly operate in weightless conditions. Something that is ensured



The Ariane 5 upper stage EPS. German companies such as DASA or Daimler-Benz Aerospace are the primary contractors for the EPS – and PACO is amongst them.

by the EPS – the "Etage à Propergols Stockables" which basically means "Stage of the Storable Propellants".

Safely supplying fuel in any position

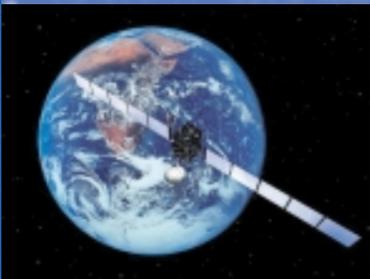
The EPS upper stage uses four propellant tanks. These feed the drive system for the delivery and positioning of the satellites. The fundamental aim of this design is to allow fuel to flow through at least one opening. To ensure that this occurs even under zero gravity conditions, slight overpressure is applied to the tank. While propellant flows through one opening, the others have to be blocked to prevent any gas from intruding. It is with this demanding operation that PACO becomes involved, by providing specialised screening technology that serves as a "bubble trap".

PACO is the master of the "bubble point"

The bubble trap effect requires that the flow resistance for the liquid propellant through the moistened

screen is less than the "bubble point" of the non-covered screen – in other words, less than the pressure that is required for air to penetrate. To enable propellant to flow through the screen more easily than air, a capillary effect is created in the mesh of the PACO screen: the feed pressure remains below the capillary pressure of the screen (bubble point) which consequently prevents air from penetrating. The component supplied by PACO, which is known as GRD (Gas Retention Device), is incidentally completely prepared, produced and quality controlled in the Steinau factory.





A unique launch vehicle: The Ariane 5 Carries Satellites in Double Packs



Three-quarters of all telecommunication satellites for the Western world are propelled into space by an Ariane launch vehicle. This means that the European commercial space industry is the most successful of its kind in the World. A reason for replacing the Ariane 4 with the Ariane 5 is the significant payload increase which means that it is the only launch vehicle that can carry two or more heavy satellites into orbit at once.

A white giant

The leading position of the Ariane 5 in the global market of carrying loads into space is based on its extremely high rate of reliability of 98.5% and its unique performance capabilities. The current payload of approx. 7.5 t is, depending on weight, not just sufficient for one but for two, three or more satellites that are to be brought into a geostationary orbit. From 2006 onwards an increase in capacity to approx. 12 t is intended. The payload capacity for the shuttle

service to the international space station with help of the unmanned transport vehicle ATV is to be further increased to 20t. This all means that the Ariane 5 also leads the way in the competition for economic efficiency.

European success –

a German contribution to quality
The initiator of the Ariane program is the European Space Agency ESA, which is made up of 14 member states. The program is managed by the French space agency CNES. Responsible for the production of the central stage and the propellant boosters is the French aerospace company Aérospatiale – together with Euro Propulsion. Daimler-Benz Aerospace Dasa has been a project partner from the very beginning of the Ariane program. It supplies large sections and a number of smaller components which are used in various areas between the tip and the foot of the rocket. DASA is also the contractor for the component in the EPS tank that is supplied by PACO.

New: EN 9100 (E) ff / AS 9100 ff PACO Certified for Aerospace!

PACO has added yet another quality management certificate to its collection: certification according to EN 9100 (E) ff / AS 9100 ff. This, at the same time, means the approval and listing for the European aerospace industry in the international database OASIS (Online Aerospace Supplier Information System) of the IAQG (International Aerospace Quality Group).

Qualified as a high-tech supplier
The standards of the EN 2100 series provide the framework for an extensive quality management system based on EN ISO 9100:1994 and EN ISO 9001:2000. They are technically the equivalent of the standards SAE AS 9100/9110/9120.

Whoever is in possession of a certificate confirming compliance with one of the new EN 9100 (E) ff / AS 9100 ff standards has proved that they are qualified to be a supplier to the aerospace industry, being manufacturers of subsystems or finished aircraft or spacecraft. At PACO we are proud and, at the same time, confident that we have achieved this after an extremely demanding certification procedure. We wish to take this opportunity to thank everybody that has worked with us to make this achievement possible.

for increased demands

The new standard expands the existing QM standards in specific areas to satisfy the increased quality and safety requirements demanded by the aerospace industry. The additional demands primarily focus on the following areas:

- A configuration management system to monitor the functionality and design status of products throughout their entire lifetime
- 100% traceability of data pertaining to all raw materials, resources, procedures, tooling and personnel used
- Detailed definition, in agreement with customers and legislative authorities, of the safety and function of the product to be produced
- Risk analysis and evaluation when new technologies are employed

PACO – an established aerospace industry supplier

For a long time, PACO has been supplying the aerospace industry with products such as special meshes for acoustics screens that absorb noise in aircraft engines or aluminium or

S. Schäfer (PACO) and H.B. Wundersee (EADS Space) meet on 7th July 2004 at the presentation of the Quality Management Certificate EN 9100 P 2 (S1) which was made at the space transport technology specialist's premises.

copper cloths for components that protect against lightning strike or electromagnetic interference. However, the reason for obtaining the additional certification was the supply of filter components for satellite tanks such as those to be used in the Ariane 5.

This PACO component is an integral part of the GRD – Gas Retention Device – in every EPS tank of the Ariane 5.



For further information
www.Paco-online.com

PACO at the 9th Iran Oil Show 2004

“We Want to Systematically Take Part in the Oil Boom in Iran!”

Interview with Klaus Ruppel, PACO Export Manager

PACO World: *Mr. Ruppel, you were recently in Iran, or to be more precise, in Teheran. why?*

K. Ruppel: The 2004 Iran Oil Show was held there between 6th and 9th July. This is the largest and most important show for the oil, natural gas and petrochemical industries in

vibration screening machines that separate unwanted solids (e.g. coarse drill cuttings) from the drilling mud.

PACO World: *Is production being limited to screens, or will the 2nd major PACO activity – filter technology – also be established?*

take part in the oil boom in Iran. And with the way that the show went for us, we are very optimistic that we will succeed.



the Middle East. For the first time we were represented there with our own booth. This was a very important event for us at PACO.

PACO World: *Is that not a rather expensive undertaking for a medium-sized company?*

K. Ruppel: We have no choice! In a global economy the markets don't come to us, we have to go into the markets! And Iran is a particularly interesting market for us. The Iranian oil minister stated that the country's oil sales in 2004 will increase to approx. 21 billion US\$. Further to this, the Iranian President reckons on bringing investments exceeding 100 billion US\$ into the country to dynamically expand the industry. For us, this means that on top of the investors that are already active, there will be a wide range of companies that could potentially use our products. We just have to be present.

PACO World: *Such a presence far away from the company headquarters in Steinau has to be well prepared and requires a sound local infrastructure. How will PACO make sure of this?*

K. Ruppel: The fact is that PACO has already been active in Iran for a number of years. A Joint Venture with the company Damavand in Teheran means that we already have local production capacity. The weaving mill that was set up in 1999 will receive two extra PACOHM looms at the end of 2004 and another four PACOHM and PACOHM-S looms during the first quarter of 2005, so that we can keep up with the increasing demand. The cloths that we produce primarily go into screen production at Damavand. Our Joint Venture partner uses this to equip all common makes of screen for use on shale shakers; these are

K. Ruppel: Yes, during the Iran Oil Show we have agreed to set up a joint filter manufacturing operation together with our partner Damavand under the technological leadership of PACO before the end of the first quarter in 2005. This will be housed in our partner's newly built 8000 m² production facility. By the way, this is ideally located on an easy-to-reach site near to the new Imam Khomeini International Airport.

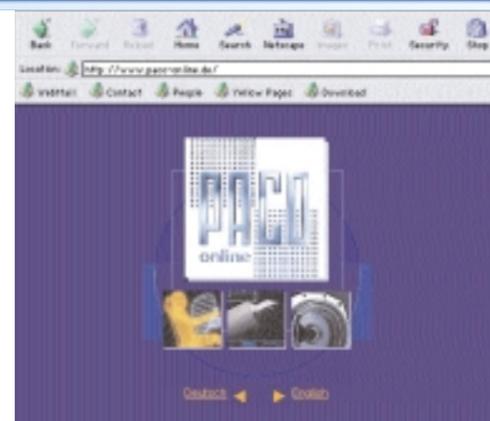
PACO World: *Where are the filter products to be used?*

K. Ruppel: Filter elements are in great demand in the petrochemical industry. And I think that our experience and quality will give us a good chance here.

PACO World: *Finally, how would you rate the results of your presence at the Iran Oil Show?*

K. Ruppel: We are very happy with the results. We made a number of initial contacts with enquiries regarding both our screening and filter technology. And, as I mentioned earlier, we could further develop our cooperation with our Joint Venture partner. We want to systematically

PACOPLATE® filter media are used, amongst other things, for the filtration of high viscosity fluids (melt filtration), for air rectifiers (centralised quenching in air quench cabinets), in suction filters, centrifuges, fluidizing bed applications, ventilation of silos as well as in the chemical, biotechnology and pharmaceutical industry.



Visit us online!
www.paco-online.com

PACO was present for the first time with its own booth at the Iran Oil Show. In addition, PACO was also represented at the booth of its Joint Venture partner DAMAVAND.



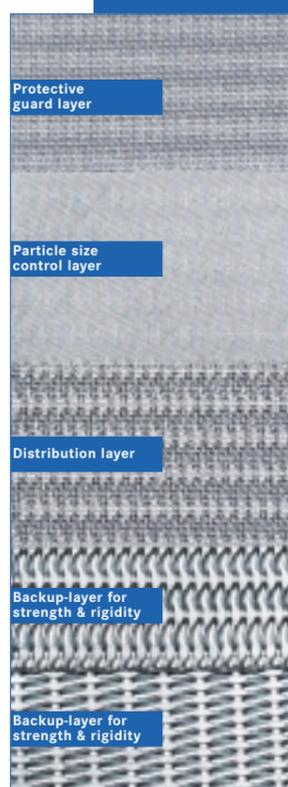
PACOs Short Guide to Weaving

8. PACOPLATE® Cloth Laminates

Laminates are composite materials that consist of two or more layers. PACOPLATE® is a filter media made up of a number of layers of various steel wire cloths that are sintered together using high pressure and heat.

PACOPLATE® is made of stainless steel wire cloths that use the standard materials 1.4301 (T304) and 1.4401 (316).

The cloth mixture is specifically chosen for each individual filtering application to provide an optimum combination of durability, filtering accuracy, high flow rates and regenerability. The range consists of two layer types with cloth thicknesses of 0.15 mm through to versions with a hundred layers and filter thicknesses of up to 100 mm. The filtering accuracy ranges from 1 µ to 200 µ. Characteristic to the product are its high mechanical loading capability, ease of processing, inherent stability, high scuff resistance, high thermal loading capability (up to 600°C), good contamination absorption and ease of cleaning.





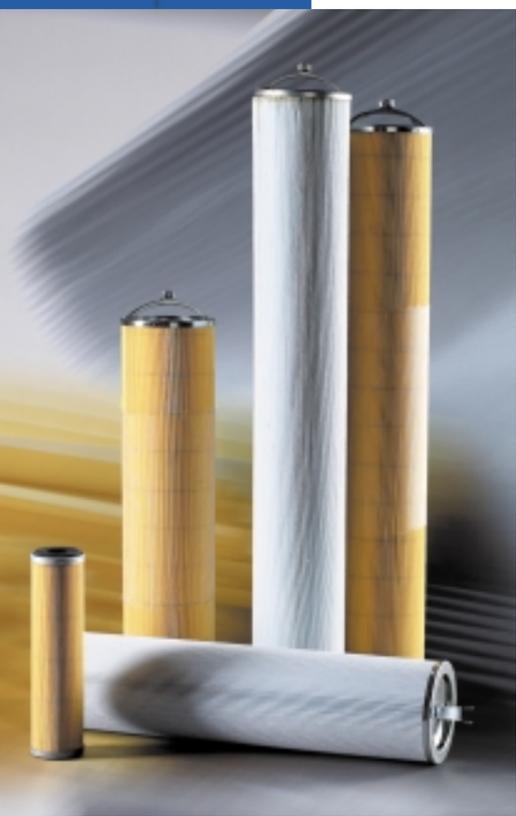
PACO filter media for stirrer devices – specialists for coarse and fine

When it comes to filtering fluids containing special solids, stirring filtering dryers and stirrer devices are much requested specialists. This is particularly the case when subsequent treatment of the separated solids is required – for instance, washing or mashing in the plant. The fluid and solids are separated through vacuum or pressure or a combination of both, with this being optimised through heating or cooling. Examples of such

processes include applications for waste water conveyance and processing, rain retention or flood water protection.

The preferred filter media in stirrer devices are

- PACO metal filter cloths,
- PACOPLATE® as filter cassettes,
- ceramic filters or
- filter bags .



We will immediately do, what we (also) can: New from PACO: Paper Filters That We Produce Ourselves

Whoever can fold, pleat and process metal cloth into filter elements can also do this with paper and polyester fiber fabrics. Following frequent requests, PACO has, therefore, expanded its filter range to include non-metallic filter elements that they produce themselves. Further additions and amendments to the range are planned for the future.

Highest quality filter media and manufacturing

PACO filters with non-metallic filter media are manufactured to equally high standards as those that characterise PACO metal wire cloths. This means that only top quality special papers are used for the production of paper filters. The paper manufacturers have to guarantee that the fibre and pore structure as well as the filtering accuracy are, in all respects, as specified by us or by our customers.

To provide the largest possible filtering area in the tightest space, PACO paper filters have an extremely precise folding geometry. The height of the folds varies according to the filter size, differential pressure, flow rate and medium to be filtered. The filter medium is processed – if necessary, with a supporting fabric – on a dedicated pleating machine, that has been especially developed by PACO. In a sequence of steps, the filter medium is pleated and cylindrically formed into a sleeve and then glued in the area of the axial joint.

The end pieces on the upper and lower seams of PACO paper filters are drawn from stainless steel or galvanised steel sheets in the company's press shop and then glued to the filter. The adhesive or sealing compound used, being specially selected according to the specific application of the filter.

High performance for universal applications

The demands placed on filter elements made of paper or polyester fibrous media are just as high as those placed on filters made of other materials: good dirt hold capacity through optimum porosity and uniform pore distribution, low flow resistance, excellent water separating capability and high mechanical, thermal and chemical stability. In addition, other characteristics such as high wet tenacity, high form stability and long filter lifetimes are also particularly important. Finally, the filters have to prove that they are environmentally friendly as well.

The range of PACO paper filters consists of filters in almost any needed shape and size for use in a variety of fields from waste management, the motor industry and effluent disposal through to biotechnology, chemicals and the pulp industry. Application examples include industrial engines, construction machines, compressors, heavy goods vehicles, agricultural machinery, fork-lift trucks, stationary engines and vacuum pumps as well as shipping, yachts, disposal engineering and dust separation equipment.

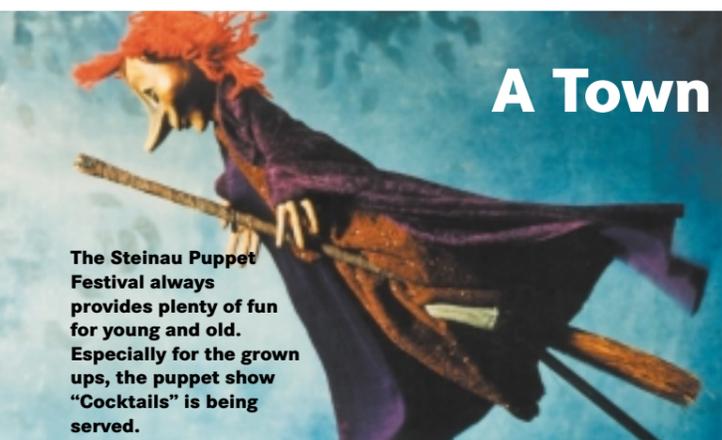
The new PACO paper filter range provides a further example of the high quality that applies to all PACO products. With their development, PACO can draw on over 25 years experience of producing pleated filters out of metallic filter media such as Pacomesh, Pacopor/Pacofil or PACOPLATE® "L".



Bits and Pieces: The Old Trapper

In the far north of Canada, an old trapper was preparing himself for the imminently approaching winter. He busily hacked wood and stacked it in front of his log cabin. As an Indian from one of the native tribes came past, he asked him, just to be on the safe side, what the winter would be like. "It's going to be as cold as usual!" was the reply. Being a cautionary man, the trapper stacked some more wood in front of his home. As, a short time later, a chief came past, he once again enquired about the sort of winter that could be expected. The chief pensively looked at the stack of wood and said: "Its going to be a fairly hard winter." Consequently, the trapper made his stack of wood even bigger. Just by chance, the big chief came past and the trapper asked him as well. The answer came with a serious expression on his face: "The winter is going to be exceptionally long and cold." As the trapper hacked and stacked even more wood, he asked the big chief why he and his tribe had such an unusual instinct for foretelling the coming winter. "Excuse me, we haven't got an unusual instinct for foretelling the winter.", was the puzzling answer, "but if such an experienced trapper stacks this much wood in front of his cabin, then we can be certain that the winter is going to be really tough."

A story picked-up and freely passed on by an economist to illustrate the secret of cause and effect in economics.



A Town Lets the Puppets Dance

The Steinau Puppet Festival always provides plenty of fun for young and old. Especially for the grown ups, the puppet show "Cocktails" is being served.

Steinau a.d. Straße:

Fairy tales and puppet shows belong to Steinau just as much as a topping of cream on a bowl of succulent strawberries. Between the 2nd and 13th October, the town of the Brothers Grimm hosts the 12th Steinau Puppet Festival. This year's theme is Grimm und Otfried Preussler. Stages are expected from throughout Germany and the Czech Republic. The shows being staged range from

"Little Red Riding Hood" and "The Brave Little Tailor" based on Grimm through to Preussler's best sellers "The Robber Hotzenplot" and "The Little Witch". There is also a puppet show called "Cocktails" that is being especially put on for the grown ups. If you are looking for an excuse to come, why not visit us at PACO in Steinau and take a look at the puppets while you are here!

Impressum



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