

PACO

WORLD

Our International
Wire&Mesh Magazine
for Existing and
Prospective Customers

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Family Businesses and Globalization

Dear Reader!

Globalization means that the world is getting smaller – and that's a good thing as this brings markets, business partnerships and people closer and closer together. Nevertheless, this isn't the recipe for success in itself. The situation is much the same as that of a family. Everybody feels connected in some way, but they still have their own personalities, desires, responsibilities and chances.

So why shouldn't a family business be a successful role model for globalization?

The key to success always was and always will be personal involvement and the sense of responsibility that this generates. This leads to a level of commitment that is of far more value than any discounts or dumping price wars will ever be: it means better solutions, better quality and better service so that our customers have a far better chance of a successful long-term relationship with their downstream users.

PACO is a family company. It was founded by my father who is still a director of the company despite being advanced in years. My brother and I are responsible for the daily running of the business. And the next generation is already preparing themselves for their commitment to PACO. More important than this, however, is the sense of family responsibility throughout the whole company – common to all members of staff regardless of background, trainees and experienced professionals, suppliers and customers, partners from science and research etc.

I am convinced that the feeling of being part of such a close-knit community is the best recipe for success that there has ever been. But this always has to be honestly meant.

Best Regards

Peter Ruppel
Managing Director



Electronic Printing – Screen Printing for RFID: The Finer the Better with PACO!



The abbreviation RFID stands for “Radio Frequency Identification Application”. As its name implies, this method enables the remote retrieval of identification data that has been stored on an object. As RFID chips are getting smaller and smaller, extremely precise screen printing is required. A trailblazer for this development are, once again, PACO SD stainless steel precision cloths for screen printing.

Strong growth anticipated

Renowned market researchers are predicting strong growth in the market for “printed electronics”. The industrialised countries leading the way in the development of this field are Japan, Sweden, Great Britain, USA, China and Germany. And PACO is directly involved. The most important applications for RFID are in the food processing industry as well as pharmaceuticals and medical supplies. There is further potential in areas such as anti-counterfeiting and protection against shoplifting. It is, therefore, no surprise that retailing and logistics companies are looking to the widespread use of RFID technology as a way of reducing costs and improving efficiency.

The components of RFID technology are a chip (transponder) as well as an antenna that are attached to an object or animal and a reader. This not only controls the reading process but also

contains the interface to the data processing systems and database.

Better than barcodes

The non-contact identification of goods, materials and products is a central process within logistics systems. Until now barcode systems have predominantly been used due to their reliability and comparatively low cost of operation. A disadvantage, however, is that the systems are relatively unintelligent. Apart from the identification of the respective object, no other information is passed on. RFID technology, on the other hand, can be used to obtain further information than just straight-forward identity details. The use of RFID has, for instance, become accepted practice for the identification of animals, passports or banknotes. As the cost of this intelligent technology has been brought down to a matter of cents for each object, the door is wide open for a far wider range of applications.

Smart labels – screen printing, the technology of choice

The term “smart label” describes a paper-thin RFID chip or transponder configuration. Generally, this is a thin plastic film onto which a transponder coil and chip are applied. The procedure of choice to apply the transponder coil is a screen printing process – although

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Electronic Printing – Screen Printing for RFID

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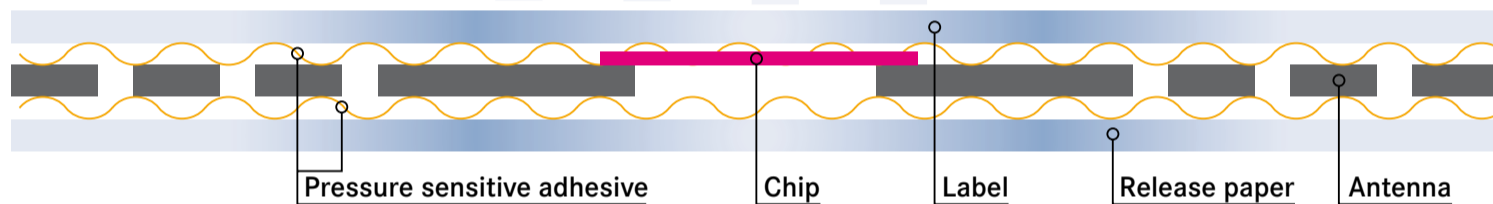
sometimes an etching process is used. Nevertheless, there are also differences in the chosen method of screen printing. When, for instance, printing screens made of polymer filaments are used, the inherent higher flexibility of the material means that there is a higher risk of inac-

curacy. The more miniaturised the electronic elements have to be, the more important the reliable stability of the screen cloth becomes – something that can be better ensured when stainless steel wires are used. At the same time it is important that film thicknesses of at least 25 µm can be attained so that the resistance in the individual tracks of the circuit can be kept to a minimum. Further to this, the pastes that are printed have to have good drying and hardening characteristics.

intensive and hard to implement production technologies, screen printing is proving itself to be the best solution – and particularly screen printing on the basis of metal wire cloths. All the more so as RFID chips get smaller and smaller – the size of a grain of rice already being state of the art. And the miniaturisation trend shows no signs of letting up. A development that speaks for PACO: as the tracks to be produced on the RFID chips get smaller and tighter, utmost precision becomes more and more important for the screens used to print them. This is where PACO SD stainless steel precision cloths for screen printing come into play. They enable extremely fine and tight tracks to be printed with excellent edge definition and an optimum register accuracy. In other words: the time is working for PACO – and PACO is working for the future.

A RFID inlay consists of three components: 1. RFID chip, 2. aluminium-etched antenna and 3. connection between the chip and antenna. All three components are applied to a special plastic film through a screen printing process. This is then integrated into a paper label and affixed to goods that are to be managed in an automated logistics system.

Predestined for RFID: PACO precision screen printing cloths
Although a number of manufacturers of RFID transponders are still using cost-



PACO Spin Pack Filter for Synthetic Fibre Production: Increased Filter Surface for Optimum Lifetimes and Throughput

The heart of any synthetic fibre production is the spinneret with its various components. This multi-pored device not only influences the quality of the fibres, but also the productivity of the fibre or film manufacturing operation. In turn, the heart of this is the spin pack. Its properties and design have a direct effect on the cost-effectiveness, reliability and consistent quality of the manufacturing process. PACO has now developed a type of filter with a special pleating and optimized edge design. This increases the polymer throughput of the spin pack filter and enables longer lifetimes.

A science in itself
Spin pack filtration is a science in itself. The system developer and process engineer have to take a number of different options into account. It is, therefore, extremely surprising that operators often seriously neglect the spin pack, as evidenced by a recent study carried out in the USA. Further to this, cheap filters are often used. The cents saved here are often spent many times more on shorter exchange intervals and a drop in the quality of the fibres.



More pleats – more filter area – more throughput

With the help of advances in pleating technology, PACO has been able to develop a spin pack filter with an increased number of pleats. Additionally, the design of the filter edge has been optimized so that the risk of leaks can be further minimized.

The high viscosity of the molten polymer requires correspondingly high pressing forces that place considerable stress on the spin pack filters and frequently cause problems in the production process. For instance, a leak may occur at the edge of a pleated filter with the result that unfiltered polymer can directly enter into a spinneret and clog it with contaminants. In addition, the high pressure can cause the pleats of conventional pleated filters to be strongly pushed against each other thereby substantially reducing the filtering surface to that of a flat filter.

The increase in the number of pleats provides significant competitive advantages. The larger filter area enables a higher throughput volume and longer lifetimes. The latter, in turn, means that the outlay in time and money for inspection and servicing work can be reduced. Further advantages are: less production downtime, increased filtering accuracy and, above all, improved product quality.

The new PACO spin pack filters can be tailored as required for any production process by taking into account parameters such as flow rate, viscosity, pressure loss and lifetime.

PACO R & D can provide custom solutions, offering a service that accompanies development and assists with implementation of the application on an industrial scale.

PACO spin pack filters are available in different shapes, sizes and finenesses. But they've all got one thing in common: high quality PACO filter media.



PACO Mechanical Engineering

Why We Can Cut the Finest Figure

The cutting of extremely fine metal wire cloths in the fabric grain direction is an art that has to be mastered. A human hair is between 40µm and 75µm (thousandth millimetre) "thick". PACO metal wire cloths often have mesh openings of 3µm and need to be cut into widths of less than 10mm. The skill of a top hairdresser or tailor will be more than stretched to its limits here. Highest precision expertise is needed, and this is put into practice by PACO's own mechanical engineering team.

Jobs of a completely new scale
Something that from a conventional point of view seems quite easy – such as cutting cloth – is a real challenge if you have to do it on a microscopic scale. The tailor still uses shears to cut his cloth for a made-to-measure suit – and the technology used in state-of-the-art automatic cutting machines for the ready-to-wear market is fundamentally the same too. But when it comes to cutting the

finest metal cloths, such as those made by PACO, conventional methods are nowhere near up to the mark. Standard ready-to-buy solutions cannot meet the high-level demands respecting precision and easiness on the material.

Whoever wants to cut cloths considerably thinner than a human hair in the fabric grain direction has to be prepared to innovate.



We prefer to rely on ourselves
PACO stands for the mastery of even the most difficult challenges. Our mission, nevertheless, doesn't end at just producing more and more demanding products. To make sure that we are continually in an even better position to satisfy our customers' needs, we invent and implement the necessary production equipment. In this way we can be sure of providing total quality.

An excellent example of this company philosophy is the cutting of metal wire cloth: the exact cutting of cloths with mesh openings of 3µm in widths of less than <10mm or the cutting of cloths with 300µm mesh openings and a wire thickness 0.20mm is not possible with conventionally available solutions. That is why a number of years ago PACO's own mechanical engineer-

High precision cutting system produced by PACO mechanical engineering to cut the finest metal wire cloths within the closest tolerances.

PACO Export Report In Malaysia Palm Oil is Filtered with PACO

Malaysia is the world's largest exporter of palm oil and palm oil products. Together with Indonesia, this peninsula in the South China Sea accounts for more than 90% of the world production of palm oil. After soybean oil, palm oil is the second-most widely produced vegetable oil.

Universal raw material for the home and chemical multinationals
Palm oil is considered to be an excellent cooking oil and frying fat, it is vegetable, can be heated to high temperatures and is in itself tasteless. These characteristics are valued, among others, by globally active hamburger restaurant chains. But this doesn't tell the whole story about palm oil. It is also a raw material of considerable importance for the chemical industry – keyword: fatty alcohols. Regardless of if you are looking at washing detergents or face cream, textile finishing or biodiesel – palm oil is always there.

Filtering as a key function
Palm oil is extracted from a mash that is made by milling mature palm fruits. PACO products are introduced early into the process at the crude palm oil stage. This is separated from long fibres, kernels, kernel shells and coarse contaminants by vibration screens – often double-deckers.

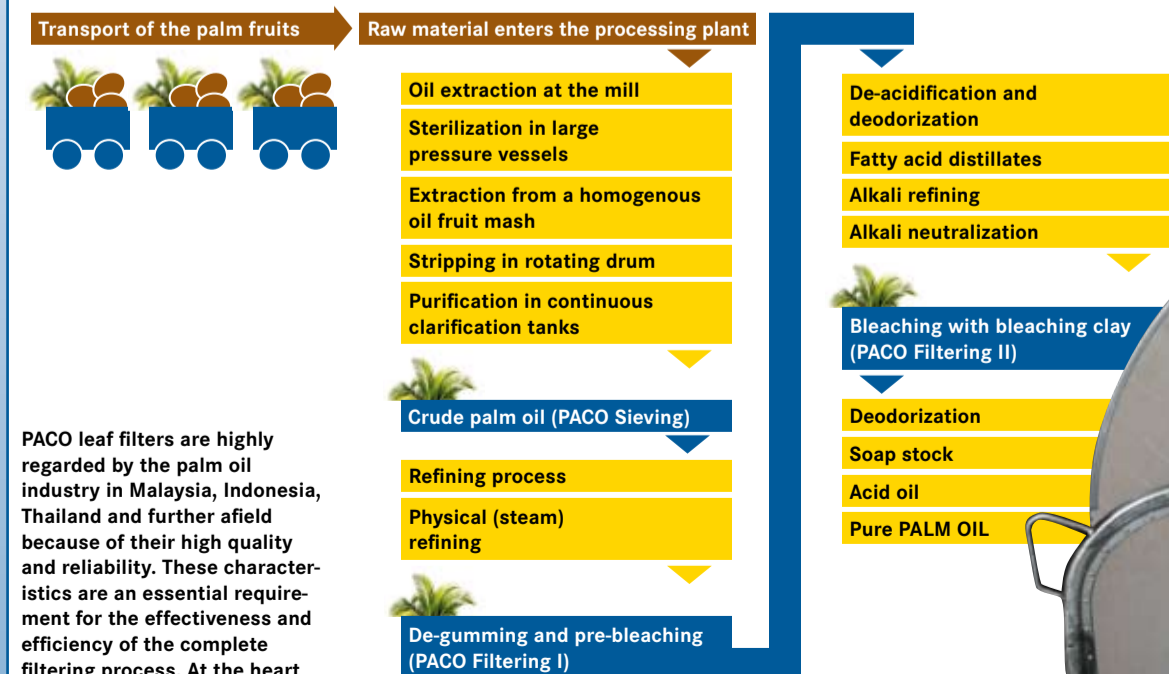
To finally produce pure palm oil, various filtering processes are required where PACO products are also the filters of choice (please refer to the flow chart showing two alternative processes).

During the refining, the oil is heated in a vacuum environment for chemical

bleaching using phosphoric acids and active bleaching clay. At the end of this processing step, the oil and mineral mixture is pressed through hermetic PACO leaf filters with stainless steel mesh elements before polishing filtration brings the product to the desired level of purity.

In the next edition of PACO WORLD we will report in more detail about leaf filters and PACO filter plates.

Palm Processing Flow Chart



PACO leaf filters are highly regarded by the palm oil industry in Malaysia, Indonesia, Thailand and further afield because of their high quality and reliability. These characteristics are an essential requirement for the effectiveness and efficiency of the complete filtering process. At the heart of this is the perfect design, shape integrity and durability of PACO filter elements.



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ing team started development of its own cutting systems to make sure that the demanded high precision could reliably be achieved. Of course, over the years the designs have been continually refined to constantly set new standards. Consequently, it is no surprise that customers from around the world and even competitors value PACO expertise for the high precision cutting of metal wire cloths.

PACO at the INTERPART: Subcontractor Products as Stars



A place for intensive talks:
Dipl.-Wirt. Ing. Roland Kirchner from PACO at the joint stand with DOERING at the INTERPART 2007 in Karlsruhe.

This year, PACO once again exhibited together with its authorised sales partner DOERING GmbH at the INTERPART in Karlsruhe, Germany. This "International Suppliers' Trade Fair for the Automotive, Machine and Construction Engineering Industries", that took place between the 9th and 11th October has established itself as a main attraction for purchasers, designers, developers, production managers, quality managers and others in the procurement process. A further increase in the number of visitors at the fair as well as on the PACO/Doering stand underline the success of the show concept.

Quality before quantity
Whereas other suppliers' trade shows present the complete process chain, the INTERPART completely concentrates itself on subcontractor products and services – they are the "stars". This not only means that there is a more exclusive specialist audience, but also it is much easier to select potential suppliers on the basis of experience and particular qualifications. All in all, excellent conditions to develop existing national and international business relationships as well as, of course, to set-up new ones.

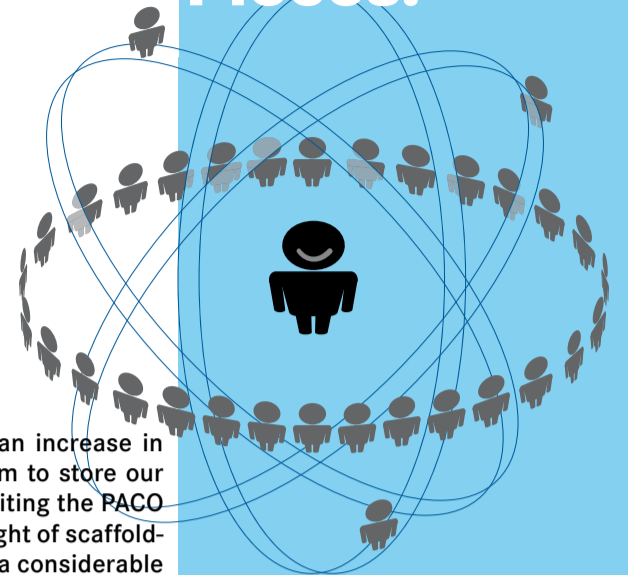
Compared to the previous year, the number of visitors to the fair increased by 15%. And on the PACO/Doering stand there were almost 10% more direct contacts with visitors as well as individual discussions.

Metal wire cloths – at the centre of interest

One of the strengths of the PACO/Doering show appearance was the presentation of complementary products solutions. Centre-stage was primarily taken by PACO metal wire cloths together with knitted metal wire meshes and perforated sheets. Visitors to the INTERPART particularly value the opportunity of one-on-one discussions that they get. This is simply not possible at large trade shows such as the ACHEMA or Hanover Fair. It is, therefore, no surprise that the PACO/Doering stand at the INTERPART was once again a favourite spot for intensive trade talks which will influence developments for a long time after the show has finished. The following up of leads is already well underway.



Bits and Pieces:



Building Progress: More Room for Further Growth!

A manufacturing company cannot, unfortunately, just increase hard disk capacity to cope with an increase in customer demand. Our machines need a lot more space, just the same as we need plenty of room to store our products and accommodate the extra staff that we have hired. That's why anyone working at or visiting the PACO plant at the moment will find themselves on what appears to be a major construction site. But the sight of scaffolding, the sound of pneumatic drills and, at times, a hectic working atmosphere are the precursors of a considerable improvement in workplace quality.



A gap between buildings is being closed: additional space for the re-screening service and production is being created.



What is a Customer?

A customer is always the most important person in a business.

He doesn't depend on us, we depend on him. He doesn't mean an interruption in our work, he is its content. He is not an outsider of our business, he is a part of it. He is not somebody that you argue with. After all, nobody will ever win an argument with a customer.

A customer is a person that tells us what they need. Our job is to do this to his and our satisfaction.

Handwritten in approx. the 12th century by Hans Heinrich Path in Eismar Abbey.

Extension of Plant II in Steinau's Western Industrial Estate

While, due to its complexity, the extension of the company headquarters in Steinau is still underway, the expansion of the production facilities in Plant II (Western Industrial Estate "Im Poppen") is already taking shape. During the first phase of the project, a 400 square meter gap between two buildings will be closed. This creates desperately needed space to expand sieve production and

other closely related activities. The need can be clearly seen when you look at the size of the current operation: six stretching tables + peripheral equipment have been installed that can handle frame diameters of up to 3000 mm. These are complemented by production lines for endless belts and eyelet sieves.

As particularly the re-screening service is quickly expanding, the creation of additional space is unavoidable. That is why the extra 400 square meters clearly

mark the way forward for not just this area of our activities, but also for the staff working there.

The next step in the expansion of Plant II is the thorough renovation of a building that is currently used as a store. This has an area of 600 square meters and will be constructionally optimised as well as being fitted with thermal insulation and a heating and air conditioning system to perfectly equip it for the cutting-to-size of coarse and medium cloths.

Steinau an der Straße: Diplomats Economic Tour Stops-Over in the Brothers Grimm Town

Steinau, PACO and diplomats from around the world: the visit of the Diplomats Economic Tour was a complete success.



Globalization is everywhere – including, of course, Steinau an der Straße. This fact was proved by the visit in the Brothers Grimm town of a number of diplomats from around the world. The names of the countries represented reads like a page out of the PACO export atlas: India, China, Indonesia, Malaysia, Australia,

Russia etc. The delegation from the German-Asian Economic Circle's Diplomats Economic Tour consisting of General Consuls and Consuls were also guests at PACO, where they were treated to a company tour. What really got the diplomats excited was the extent and levels of manufacturing that could be seen and

experienced in the company's headquarters in Steinau.

The view of the weaving mill with its hundreds of looms was something that the visitors won't forget for a while.

Local companies were then given the chance of presenting themselves in the Steinau market hall. PACO was also

there with its own stand. The upshot of this is that Steinau has proved that its local companies can provide an international platform and that a comparatively small town can be home to companies that have achieved great things.

PACO's Short Guide to Manufacturing



Annealing – Drawing Quality Out of the Fire

Annealing is a manufacturing process that can give metallic materials better processing properties. Although it might sound easy: heating, holding the temperature at the annealing point and cooling – annealing is a very sophisticated refining process. Changing the microstructural condition of the metals and causing their re-crystallisation is an extremely difficult challenge.

At PACO, the processing step "annealing" is carried out to improve and stabilise the physical characteristics as well as systematically changing the mechanical properties of the metal cloths. For heat treatment, PACO uses a fully automated continuous annealing lines. These work within the temperature range of 750°C to 1200°C and have an electronic multi-zone control system, a controlled inert gas feed and a special viewing unit.

Imprint

All information in this edition of PACO WORLD has been carefully checked prior to publication. Nevertheless, we can make no guarantee for completeness, accuracy and up-to-dateness.

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