

PACO WORLD

Our International
Wire&Mesh Magazine
for Existing and
Prospective Customers

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PACO Show Culture: With Expertise and Hospitality

Dear Reader!

Trade shows are a strange phenomenon: everyone finds them extremely tiring, but whenever they get the chance they always want to attend. For companies, shows take a lot of organizing and often entail a significant financial expenditure. It is essential that the company presents itself on its stand in the best possible light through an appealing stand architecture and comprehensive technical equipment. For the staff that are entrusted with representing the company on the show stand, one of the most strenuous parts of show life is the time spent waiting for visitors to come and talk and get information just as much as the talks and provision of information itself. And which show visitor has never come away with sore feet and mental exhaustion?

Despite this: if there was no such thing as trade shows, they would have to be invented. There is no other professional communication tool that is able to reach such a broad specialist audience, while at the same time being able to develop personal contacts and to provide the opportunity of one-to-one discussions.

In the past few years PACO has stepped up its presence at trade shows both nationally and internationally. In Germany the trade shows that PACO regularly appears at include FILTECH, POWTECH, easyFairs SCHÜTTGUT and the AICHEMA. Internationally we have presented ourselves over the past few years at leading trade events for screening and filtering technology in Russia, Indonesia, the Middle East, India and China. I have just got back from Beijing, where we took part at the ACHEMASIA. This visit brought home to me another advantage that only trade shows can offer: to gain first-hand experience of how quickly markets can develop and change. On one hand, it was interesting to see just how many competitors there are in the field of metal wire cloths. And on the other hand, to see the growth of high-quality special solutions. In other words, for PACO trade shows are becoming an increasingly important tool for its corporate communication. As well as being an ideal meeting place for keeping in touch with our customers as well as our competitors.

I would like to take this opportunity of thanking my trade show team for continually subjecting themselves to show stress. And I would particularly like to thank everybody that has visited a PACO show stand somewhere in the world. We are always working hard to provide our visitors with an informative, solution-oriented and, at the same time, hospitable show destination. Our homepage will keep you up-to-date with PACO shows dates. We would like to take this opportunity to invite you to visit us there or at one of the trade shows themselves.

Best regards


Peter Ruppe
Managing Director



The WWF estimates that cargo ships transport approx. 10 - 12 billion tonnes of ballast water across the oceans – and pump this back out into the harbour basins. Without preventative measures this would destroy the native aquatic flora, cause fish stocks to die out and damage the port installations and industrial piping systems. Estimated damage: approx. 11 bio. Euro per year.

Ballast water treatment with PACO: Fine Mesh Against Aliens From the Sea!

The logistical infrastructure for the globalization of commerce between all continents of the earth is provided by a fleet of thousands of cargo ships. Increases in the volumes of trade and competition to provide the cheapest freight rates have meant that increasingly larger, faster and more economical ships have been built that require the minimum of crew. However, this intensified use of the oceans and their waterways has allowed a largely unheeded problem to spread: the contamination of indigenous habitats by foreign plant and animal organisms that are carried in the ballast waters of ships: aliens from the sea!

The ballast water – providing the necessary stability

To make sure that ships remain stable and can safely navigate the seas, they require a sufficient draft, i.e. the depth of keel below the waterline. This changes, however, when the cargo is discharged, the level of fuel in the tanks drops during the voyage, or the load shifts due to rough seas. The weight that is necessary to provide the required draft is achieved by taking in ballast water directly from the sea. A process that also works the other way around whenever needed: if the ship takes on additional cargo or fuel, the surplus weight is reduced by pumping out the ballast

water. This method is not only extremely cost-effective, it is also extremely efficient. Nevertheless the nature of shipping is such that whole oceans may lie between the intake of ballast water and the discharge back into the sea: water that was taken onboard in Hong Kong or Singapore will not be pumped out until the ship reaches the Mediterranean or North Sea. This involves risks that were ignored for a long time. Simply the amounts involved are extremely awe inspiring: every year approx. 1.8 billion tonnes are carried onboard ships and released back into the sea. The problem is in the plant and animal organisms that

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Mesholutions created by PACO





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Ballast water treatment with PACO

are contained in the ballast water. These are not only able to upset complete ecosystems, they can irrevocably destroy them.

Ballast water treatment mandatory since 2009

Just how devastating the introduction of an alien species through ballast water can be is shown through the example of the Chinese mitten crab (*Eriocheir sinensis*). Within a short period of time, a large population had formed, which then started to prey on fish in German rivers. They also started to dig pits in dikes which has undermined the flood prevention measures. The similarly introduced naval shipworm (*Teredo navalis*) has developed a taste for the bank protection groynes along the German North Sea coast. And we don't want to forget to mention single-cell organisms such as dinoflagellates that, through a population explosion, can cause a red tide to occur. In the algal bloom phase these not only turn the sea water blood red, they also produce a poison that can kill fish. This poison can also be absorbed by mussels which enter the human food chain with the risk of food poisoning that, in the worst-case, may even cause death.

The worldwide damage caused by alien plant and animal organisms introduced through ballast water is estimated to be in the multi-billion dollar range. Necessary counter-measures are usually extremely complex and very expensive.

Although the MARPOL convention had tried to find a solution to the problem of ballast water as far back as 1973, there was no real change in the day-to-day practice. In February 2004 the IMO (International Maritime Organization), a sub-organization of the UNO, passed a Ballast Water Convention that came into force in 2009, and will become universally binding at the latest from 2016 onwards. The "International Convention for the Control and Management of Ships' Ballast Water and Sediments" stipulates that ballast water has to be treated according to predetermined standards – corresponding with the so-called "Ballast Water Performance Standard D-2" – before it can be pumped out into the sea. The initial problem in 2004

Characteristic of the reverse dutch weave PACO RDW are the extremely fine warp wires that are arranged as closely together to each other as possible with comparatively thick weft wires. This enables exact openings in conjunction with a large filter related free open area. The advantages of this cloth are filtering precision, extremely good dirt retention capabilities as well as excellent cleaning and regeneration characteristics.

was a lack of suitable equipment or processes for the prescribed ballast water management. Things have, however, significantly changed since then.

The process for ballast water treatment

Three basic processes are used for the cleansing of maritime ballast water: the mechanical, the physical and the chemical method, whereby often a combination of methods is used.

Mechanical cleansing generally consists of an initial cleaning stage with a hydrocyclone that removes coarse particles and organisms (>50µ) from the ballast water before fine filtration separates plant and animal organisms of between 10 and 50µ. With most ballast water treatment plants, this pre-cleaned water is then disinfected through a physical or chemical treatment process. Physical purification is, for instance, carried out through ultrasonic waves, UV radiation or heat treatment. For chemical disinfection, chlorine extracted from seawater, hydrogen peroxide, peracetic acid or ozone is used.

Special demands on the filter process and cloth

First of all, a ballast water purification system that is to be retrofitted to an existing ship or installed in the engine room of a new ship has to be compact, as modularly structured as possible and,

of course, inexpensive. And needless to say, it also has to be extremely powerful, as berthing times in port are getting shorter and shorter and thousands of tonnes of ballast water have to be mastered! During operation, the quality and reliability of the filtration process are of utmost importance. This means that particularly the separation efficiency has to be exactly and dependably adhered to throughout the total duration of operation. In addition, the filter media have to have long lifetimes and be unaffected by saltwater as well as mechanical stress. It is also essential that the filter elements do not have a tendency to clog, enable easy removal of the filtrate, and have very good regenerative capabilities. With all of these demands, it is no surprise that the solutions offered by the various suppliers are very closely scrutinized to make sure that they are capable of delivering the results. When mention is made of the name PACO, this is already a good sign. After all, PACO is one of the world's leading manufacturers of stainless steel wire filter cloths as well as metal cloth laminates for fine filtration. At the same time, PACO is also a leading filter maker – providing filter disks through filter candles to customer-specific filter packs. Ballast water management has long grown into one of the specialist fields of activity for PACO R&D engineers.

On course with the customer – full steam ahead!

The PACO contribution to the mechanical treatment of ballast water has proved itself in the range between 10µ

and 50µ. Of course, filtration solutions for the separation of contaminants that are significantly smaller than 10 µ are also theoretically possible. But these would require process times that are not available due to the limited berthing times of the ships in the various ports around the world. This is where physical and chemical methods come in. The filter medium of choice from the PACO range is the reverse dutch weave RDW, a cloth that is available as a "light" version or a "heavy" version, or as a reverse dutch twilled weave. This is complemented by the almost limitless possibilities for specifying PACOFIL metal cloth laminates. The best type of filter cloth for a particular ballast water management task can be determined through a series of tests at the PACO technical service center – in close cooperation with experts from the customer side. Experience has shown that when both sides work closely together to swap wishes, experiences and ideas, and develop a mutual understanding of what's needed, they will develop the best possible solution. It goes without saying that this is the time when questions about the most suitable material from Super Duplex to Hastelloy, flow rates and cleaning characteristics, the appropriate mesh design, the optimum type of seam and preferred finish such as non-stick or anti-growth coatings will be clarified.

PACO is well-known for its willingness to communicate about technical matters, which ensures that the best possible solutions can be quickly found. Try us out: it doesn't cost to ask!



Choose the avenue to increased revenue...

... is the promise on the title page of the product range brochure for PACO screen printing cloths. It describes the philosophy and technical achievements behind "PACO Smart Mesh". And it underlines the economic advantages of PACO solutions for screen printing. It also provides information about the wide variety of applications for PACO screen printing cloths: electronics & IT, foils & displays, cars & planes, energy & environment as well as china & glass. The brochure is available in German, English, Spanish and French. It can be obtained directly from PACO as a printed version or as a download from

www.paco-online.com

PACO Screen Printing Cloth

Smart Mesh – the Innovative Mesh!

It all began sixty years ago with metal wire cloth for textile printing. That was the point at which PACO joined in the competition to provide better and better screen printing solutions. Almost from the outset it became clear that both were a perfect match for each other: screen printing as a printing technology that is constantly able to redefine its boundaries – and PACO screen printing cloths that, through continuous innovation and ever increasing precision, have paved the way for new applications. Today PACO is one of the top three manufacturers in the world that offer screen printing cloths made of super fine stainless steel wires.

Inherent advantages for high tech applications

As with all other areas of production technology, screen printing has to permanently provide a fine balance between quality and cost minimization. But if you are looking for the best possible quality you can't afford to simply cut costs. This is how the competition



The fine difference between screen printing cloths is in the quality: the higher the quality of the cloth and the frame, the more precise and cost-effective the printing results will be. That is why PACO's own quality standards are just as important as systematic quality control.

for high tech applications is decided between screen printing cloths made of polyester fibres on one hand and stainless steel wire on the other. PACO screen cloths are inherently able to offer higher precision through their strong binding which provides superior register accuracy. They remain in shape up to 600°C, do not change their volume, are not susceptible to any loss of tension or tendency to abrasion and do not absorb any moisture or solvents. All in all they reliably offer higher quality with more printing cycles and longer lifetimes. Which in the end results in totally optimized cost-effectiveness.

Challenge of electronics and communications technology

Although screen printing has long established itself as recognized printing technique, the most exciting thing about it is its future! At present it is experiencing a boom, particularly due to high-tech applications such as electronics, IT, communications technology and alternative energy production. In fact the boom in the photovoltaic sector would simply not have been possible without the con-

tribution of screen printing. And this is strongly linked to the advances that the PACO development team have made to provide even more precise and powerful screen printing cloths. The fact is, however, that screen printing cannot just sit back and rest on its laurels – and the manufacturers of screen printing cloths even less. The PACO innovation of yesterday is standard practice among competitors today. That is why PACO continues to continuously develop, so that it can constantly maintain the leading edge. The rapid development in electronics and communication technology and the need for more and more precision and rationality in all areas of production mean that the innovation potential of screen printing is being constantly pushed further and further to its limits. A challenge that is of course passed upstream to the wire manufacturers and finishers.

From screen printing cloth to Smart Mesh

From PACO's point of view, the most fascinating thing about metal wire cloths for screen printing is not what they can

already do but what they could also do if needed. This means that they are never considered as a finished product, but more as a bridge to something new. In this respect PACO screen printing cloths can be considered as part of the thinking process during R&D, innovation projects and engineering refinements. That is why we have given our screen printing cloths the title "Smart Mesh" – cloths that have the capability of providing new and improved solutions.

The PACO Smart Mesh range today consists of four main products: PACO SD (standard), PACO ED (extra thin), PACO SD-AM (calandered) and PACO Solar Mesh. All have fundamental qualitative as well as certain specialized characteristics that make them predestined for a wide range of specific applications. The direct contact with PACO application engineers not only draws on the pool of experience gained from a wide variety of successful applications. There is also a large chance that, through the interchange of experiences and ideas, requests for completely new applications will result in new and innovative solutions in further fields of activity.

PACO & HETA at the AchemAsia 2013: Plenty of Interest – From the Competition Too!

China is a huge market. And China is a huge competitor. This was an experience that PACO and HETA made as they took part in the AchemAsia 2013 in Peking. All-in-all the visit to the largest international trade show for the process industry in Asia was very successful. But it was also very thought provoking.

At home in the German Pavilion

The AchemAsia is held every three years. It is organized by an "expertise joint-venture" consisting of DECHEMA and the Chemical Industry and Engineering Society of China (CIESC). The show focusses on activities that are of particular interest to the PACO Group, such as food production, pharmaceuticals, biotechnology, fine chemicals, petrochemicals, environmental engineering and water treatment.

The PACO and HETA stand was located in the German Pavilion. This was realized with the support of the German Federal Ministry of Economics and Technology (BMWi) and provided more than eighty German companies with a platform to present their products and services. In our conversations with Asian visitors to the stand, we often heard how they already are or would very much like to work together

with German companies as they value our quality, our punctual delivery and, in particular, our high level of innovation. So far, so good.

Showing an interest – too much of a good thing

The AchemAsia 2013 was able to attract 400 exhibitors from over twenty countries as well as more than 12,000 visitors. About half of the exhibitors came from China. Among these were at least twenty who could be considered to be direct competitors of PACO and HETA. It seemed that their stand personnel spent far more time on our stand than they did on theirs. Of particular interest and, despite the prohibitory signs, object of countless photographs were the HETA HSA and RSA filter systems with their unrivalled perfect finish. But also the extremely wide range of PACO filter elements on display attracted



Always ready to talk: The AchemAsia team on the PACO/HETA stand together with the Chinese distributors from Rebound Technologies (from left to right): Garvin Ruppel, Kevin Zhou, Peter Ruppel, David Song.

plenty of interest, whichever way you like to view it.

A positive balance

At the end of the show, the team on the PACO/HETA stand could not complain about having too little to do. This team was made up of PACO and HETA staff together with representatives of our Chinese distributor Rebound Technologies. There were countless discussions with interested visitors, some of which look like being intensified and developed into firm orders. In addition we also spoke at length to existing and potential customers that we had invited in advance. These not only represented Chinese and Asian companies, but also included customers from Germany that were either also presenting themselves at the show or have a subsidiary in China.

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KYB & PACO: For Power Steering Safe Must Always be Safe

There is almost no other industry that has to try to square the circle of providing quality and cost-effectiveness in the way that is expected of suppliers to the motor industry. A situation that also applies to the KYB Corporation, the world's largest manufacturer of shock absorbers and a globally active technology company with headquarters in Tokyo, Japan. A KYB manufacturing subsidiary in Pamplona, Spain has just been chosen from among all other vendors located between the EU and China to supply a sieve for the hydraulic pump in car power steering.



The safety valve in all hydraulic pumps produced by KYB will in future have a high-tech sieve made from PACO metal wire cloth to safely prevent foreign particles from penetrating into the pressure control system of the pump.

Power steering: for comfort and safety

A lot of motorists cannot remember what it was like to drive a car without power steering. Whereby cars with power steering have only been around since 1951. That was the year when Chrysler first offered power steering as an optional extra for their model Imperial. After this it took decades until power steering had established itself as a standard feature. Today, in the day and age of heavier, front wheel drive cars with wider tyres, servo assistance of the steering power has become completely indispensable – not to mention the needs of trucks, buses and other commercial vehicles.

Small but essential

The heart of every power steering system is a hydraulic pump. And this, in turn, has a safety valve. This is a pressure-relief device that safeguards the power steering against over-pressure that may occur through thermal expansion of the

medium in the enclosed system. Where necessary it will open a bypass to the hydraulic circuit to enable pressure compensation. And this means safe steering regardless of the external conditions.

At the head of the safety valve is a sieve made of PACO metal wire cloth – a little smaller than a one Euro coin. This filters the hydraulic oil to protect the inside of the safety valve against contamination. This has to be highly resistant to mechanical stress and ensure long-term stability throughout the lifetime of the vehicle into which it is fitted.

Thoroughly checked and approved

To get onto the approved list of suppliers for the motor industry is no small feat. The demanded quality has to be uncompromisingly ensured and documented through quality assurance test reports. Long-term supply guarantees are absolutely essential. And the price has to be right. With all this taken into account, the people in charge were convinced by the documentation provided by the PACO test facilities as well as the compatibility with their own manufacturing and quality management system. The standard three monthly supplier audits that KYB routinely perform will ensure that the close qualitative working relationship will be maintained. We are looking forward to a long-term and successful supply partnership.

www.kyb.ua/eu/kyb_corp

Steinau an der Straße: 200 Years of Children's and Household Tales by the Brothers Grimm

The Brothers Grimm town Steinau an der Straße can celebrate yet another Grimms' anniversary. This time it is "200 years of Children's and Household Tales by the Brothers Grimm". An exhibition that was held at the start of the year in the Brother Grimm House in Steinau also commemorated this birthday that is as equally important for the broad reading public as it is for literature buffs.



It was back in March of the year 1813 that the majority of the first edition of 900 copies of Children's and Household Tales, Volume One" originally appeared. About seven years before this, the poets and romanticists Clemens Brentano and Achim von Arnim had encouraged Jacob and Wilhelm Grimm to collect and preserve fairy tales that were passed on through oral storytelling tradition. Of the first 50 or so fairy tales, Jacob Grimm had written down 25 and Wilhelm Grimm 14. The publisher Georg Andreas Reimer from Berlin edited the tales himself and became so committed to his role that it caused tensions and delays to occur. At least he was attentive to the wishes of the Brothers Grimm and produced an affordable book that also encouraged the reader to participate. The second volume of Children's and Household Tales appeared soon after in 1814. But it was not until the second edition of both volumes was published in 1819 that "Grimm's Fairy Tales" began to take on the form that we know and love today. This version included evergreens such as the "Bremen Town Musicians", "Hans in Luck" and "The Wishing Table". Why don't you take another look at Grimms's Fairy Tales? They are still just as enjoyable as they always were.

√ Brilliant Minds

Kumar Patel Inventor of the CO2 Laser

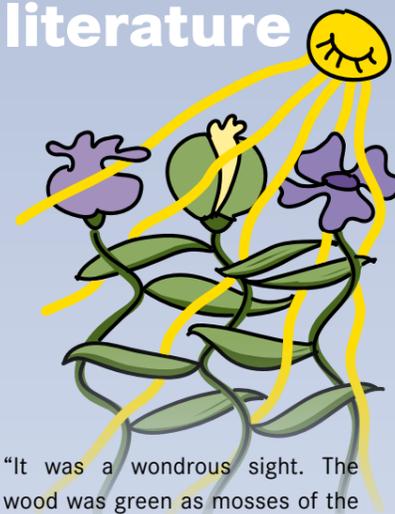
There are scientists, researchers, mathematicians and other brilliant minds to which PACO is deeply indebted because their contributions positively influence the way that we carry out our day to day business. Theme related, we would like to introduce our readers to them in a series appearing periodically in various issues of PACO WORLD.

Laser beam welding is one of the most important joining techniques used in the production of numerous PACO filter products and HETA filter systems. The advantages are a very high joining quality, thin and small weld seams, low thermal distortion and high welding speeds. Reason enough for us to take a closer look at the inventor of the CO2 laser. This was C. Kumar N. Patel, a Stanford graduate electrical engineer and physicist, who was born in India in 1938. He started his professional career at Bell Laboratories where he began by carrying out fundamental research into the subject of laser applications in pure gases. In 1963 he discovered the qualities of carbon dioxide gas for use in conjunction with lasers. As he then went on to invent the efficient transfer of energy between molecules through vibration, he had created the conditions for the CO2 laser, the first gas laser that could continually generate a high beam energy. Other types of lasers had other inventors. But we would particularly like to thank Kumar Patel for probably giving us the most useful of them all.



Bits and Pieces:

The art of weaving in world literature



"It was a wondrous sight. The wood was green as mosses of the Icy Glen; the trees stood high and haughty, feeling their living sap; the industrious earth beneath was as a weaver's loom, with a gorgeous carpet on it, whereof the ground-vine tendrils formed the warp and woof, and the living flowers the figures. All the trees, with all their laden branches; all the shrubs, and ferns, and grasses; the message-carrying air; all these unceasingly were active. Through the lacings of the leaves, the great sun seemed a flying shuttle weaving the unwearying verdure. Oh, busy weaver! unseen weaver!—pause!—one word!—whither flows the fabric? what palace may it deck? wherefore all these ceaseless toilings? Speak, weaver!—stay thy hand!—but one single word with thee! Nay—the shuttle flies—the figures float from forth the loom; the fresher-rushing carpet for ever slides away. The weaver-god, he weaves; and by that weaving is he deafened, that he hears no mortal voice; and by that humming, we, too, who look on the loom are deafened ... For even so it is in all material factories. The spoken words that are inaudible among the flying spindles ... Ah, mortal! then, be heedful; for so, in all this din of the great world's loom, thy subtlest thinkings may be overheard afar!"

Source: Herman Melville, *Moby Dick*, chapter 102 "A Bower in the Arsacides"

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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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