

# PACCO

## WORLD

Our International  
Wire & Mesh Magazine  
for Existing and  
Prospective Customers

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## Export World Championship – Who Are the Real Winners?

Dear Reader!

Supporters, that extol the virtues of Germany as an economic base, like to shrug off much needed and long-overdue reforms or justify high labour costs with sayings like "I don't know what you mean, after all, we are export World champions!"

In part they are right, German companies do top the export tables – but lets place the emphasis here firmly on the word companies! Their present position is their rightful reward for the excellent work put in by their management and staff – a fact to be thought about by those that claim the title "world champion" for themselves without having the know-how or desire to run an international business of their own. The truth of the matter is that German companies are export World champions despite their domestic business environment. For a number of us – PACO included – an economically viable existence would be inconceivable without our exports.

So what does it mean to a company like PACO to export 60% and more of production? It means that, in the face of global competition, our performance continues to convince our customers around the World! These are the victories that have to be earned day-for-day by our workforce and sales partners. Victories that give a competitive edge to our customers through the products and services that they gain. From this point of view our customers are the real winners, they get their goals, we simply provide the assists.

One thing is for sure: the winners don't include those that spend their time giving interviews that play down the disadvantages of the business environment in Germany simply by arguing: "we are still top of the export league!"

The question that I am not alone in trying to answer is: "what has got to be done to keep the lead into the future?"

I know what our company has got to do. But do those that pride themselves with the title "export world champion" know this as well?

Best regards

Peter Ruppel  
Managing Director



## PACO-Special Cloths for Diesel Soot Filters: A Move Towards Cleaner Trucks & Co.!

**Suddenly everybody has realized it: something has got to be done! The EU has issued a directive to reduce particulate matter in breathing air – incidentally, back in 1999. Now – just six years later – much to our surprise, the legislators are threatening to ban Diesel-engine vehicles without soot filters from driving through large urban areas such as Munich. Having successfully banished drink cans out of our lives, we are surely not going to give in to a bit of Diesel soot? At PACO we have been working together with our partner GREENTOP for a number of years to provide an effective filter solution that will more than meet EU standards.**

**Successful development partnership**  
A proven formula for the successful development of innovations is to choose a competent partner and start working with them from the very outset. This was the case with the alliance between our customer GREENTOP, a supplier of Diesel particle filtering systems, and ourselves, an experienced and innovative developer of filter media. One of the fruits of this co-operation is the GREENTOP-ERS PR-Kat™, a retrofit particle-reduction catalytic converter for Diesel-powered cars and trucks. This can reduce the output of potentially harmful soot particles by up to 60%. In addition, it eliminates carbon monoxide (CO) and hydrogen chloride (HC) by more than 95%. The retrofit "cat" can either replace an existing oxidation catalytic converter or be installed as an additional component in the exhaust system. Additional advantages of this solution are lower exhaust back-

pressure, no maintenance, no blocking or clogging and high resistance against thermal and mechanical loads.

**Effective operation with excellent test results**

The innovative exhaust gas purification system has an oxidation catalytic converter made of metal wire fabric and sintered metal cloth. The undulation of the catalytic converter wire directs a portion of the exhaust gas through the filter cloth which, in turn, traps the soot particles. The PR-Kat™ is formed spirally out of a number of different layers. This means that there is a very high probability that even the finest dust particles will come into contact with the fibre cloth to provide an excellent particle trapping rate of almost 60% at all points. At the same time, the open structure of the PR-Kat™ prevents the exhaust system from becoming clogged.

The reduction of the separated soot particles occurs through the continuous oxidation of carbon with nitrogen dioxide (NO<sub>2</sub>). This occurs at a temperature exceeding approx. 200 – 250° in the catalytic converter to ensure perpetual regeneration during operation. Other advantages of this system are that no electronics or sensors are required. Also, there is no need for additives or an additional fuel injection system. The research institute for automotive engineering at the HTW college for technology and economics in Dresden tested the GREENTOP-ERS PR-Kat™ and recorded outstanding data. This shows that the system even complies with the stringent standards of the Swiss VERT program as well as the German TRGS554. Should legislation

*Continued on page 2*

**To fulfil the stringent emission control levels for Diesel-powered vehicles that the EU is to introduce, new exhaust gas purification systems are required. PACO has developed special cloths that can retain more than 99% of the finest soot particles in the range between 10 – 1000 nm. PACO customers and PACO filter media developers are well prepared to fulfil the continually tighter soot emission requirements for Diesel-engine vehicles.**







## PACO Filter Media for Synthetic Fibre Production: The “Feel Good” Fleece!

The fleece being referred to here is a light but at the same time voluminous and heavily roughened artificial fur fabric produced from synthetic fibres – particularly Polyester. This innovative material was developed in the USA at around the beginning of the eighties – initially finding favour for its suitability to extreme climatic conditions and extreme sports. It gained its reputation by combining its insulating capability, breathability, durability, and ease-of-cleaning with low material weight. PACO is one of the World’s leading developers of special filtering media for the production of Polyester microfibres, which among things are used to make fleece.

**Preparing for close relatives**  
PACO’s background is in weaving – albeit with wire. That is why we are always interested in helping others to effectively produce and process their fibres or threads.

Fleece is a knitted fabric that has a deep pile on one side. If this is cut through with a special machine, the extremely thin fibres macerate to provide a particularly fluffy surface – the thinner the fibres, the fluffier the surface will feel.

The most common artificial fibre used for fleece is Polyester. A material that will only absorb 0.5% of its own weight in humidity: even this is not stored, but is quickly repelled. This advantageous characteristic is further enhanced by the large surface area of the fleece material.

Fashion designers have recognised the appeal of fleece for a long time – not only because it feels good to touch, but also because it is comfortable to wear and easy to clean. Today, fleece is used in a wide variety of women’s and men’s outerwear, its appearance and feel expressing a modern sporty way of life.

### PACO spin-packs for synthetic fibre production

With melt spinning, the molten polymer – e.g. Polyester – is pressed through very fine spinnerets. The initially hot and, consequently, fluid, material is extruded at very high speed through the spinnerets and then solidifies to produce very fine fibres. To ensure that this process is not needlessly interrupted, the molten polymer is carefully filtered before it enters the spinnerets. This process not only removes contaminants but also the additives required for the initial treatment of the material. This minimizes downtimes as well as ensuring the high quality of the finished material.

As melt spinning demands extremely high precision and reliability, synthetic fibre manufacturers around the World like to rely on PACO pre-polymer filter candles, product filters and spin-pack filters. These are available for a wide variety of common methods and polymers. PACO offers specialized filter products for the production and processing of everything from microfibres out of Polyester through to the latest super-microfibres – in each case, satisfying the highest demands for purity. PACO spin-pack sieves have proved themselves particularly with very fine yarns. Their high resistance against yarn breakage enables higher production speeds and longer lifetimes.

## A Move Towards Cleaner Trucks & Co.

*Continued from page 1*  
be introduced to fit all Diesel-powered vehicles with particulate matter filtering systems, the system jointly developed by GREENTOP and PACO will go along way in fulfilling the EU directive.

### Experience with a future

GREENTOP has already gained more than 10 years experience in exhaust after-treatment. This competitive advantage is further enhanced by close ties with research institutes and organisations. Together with development partners such as PACO and HTW, new regeneration strategies are being developed and new filter media are being tested. Membership in the FAD (circle for furthering exhaust treatment technologies for Diesel engines) provides constant access to the latest developments and proposed legislation regarding Diesel particle filters. This means that work can be begun in good time to obtain the emission control levels that are expected in the future. The EU-commissioner Günter Verheugen has already indicated in a German television interview that legislation for reduced Diesel emission soot levels can soon be expected.

## PACO Spinneret Filter for Supermicrofibres: When 10,000 Metres Can Only Weigh 1 Gram

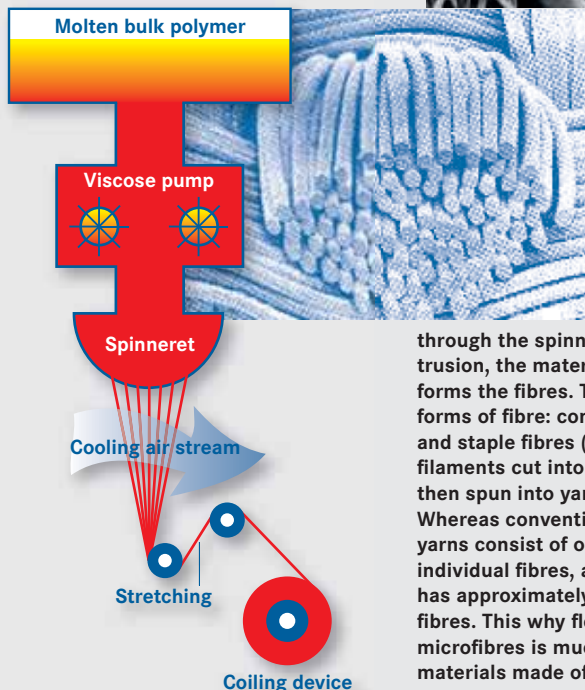
Microfibres are considerably finer than all natural types of fibre. To denote fineness, the unit “dtex” (decitex) is used. 1 dtex corresponds with a 10,000 m long thread that weighs 1 g. A silk thread has a fineness of 1.3 dtex compared to a microfilament Polyester thread that has a fineness of 0.5 – 0.8 dtex. This means that a microfilament thread is 60 times finer than human hair. As a matter of interest: 3 kg of a microfibre is sufficient to be completely wound round the earth at the equator.

The synthetic fibre industry’s products are classified as follows:

Coarse fibres	above	7.0 dtex
Medium-fine fibres	2.4 –	7.0 dtex
Fine fibres	2.4 –	1.0 dtex
Microfibres	1.0 –	0.3 dtex
Supermicrofibres	below	0.3 dtex



Difference in size between a yarn consisting of many microfibres (left) and a human hair (right).

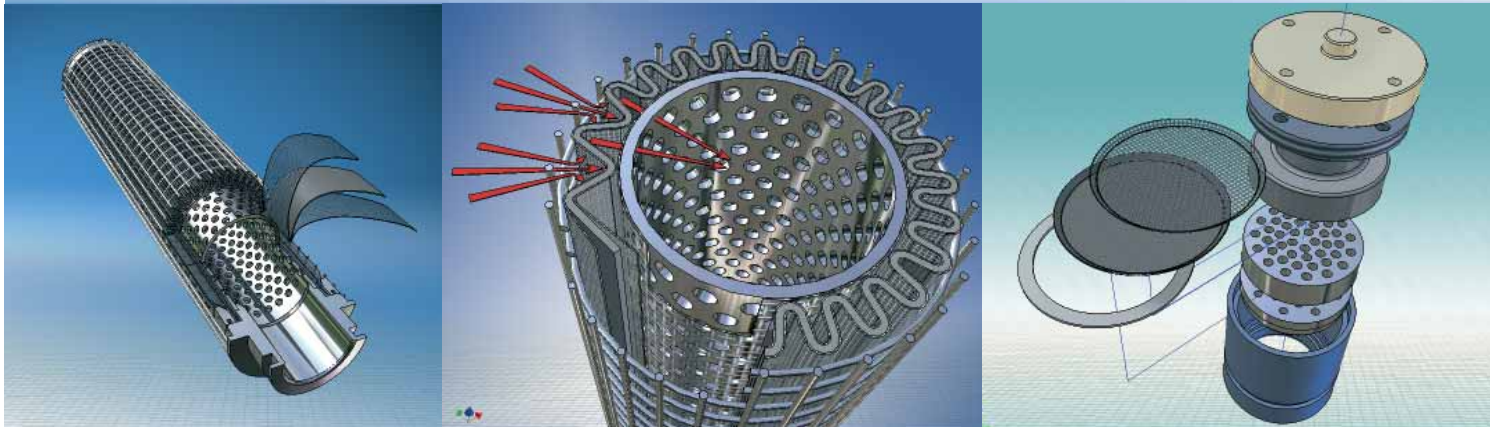


With melt spinning, the molten polymer is pressed through the spinnerets. After extrusion, the material solidifies and forms the fibres. There are two forms of fibre: continuous filaments and staple fibres (continuous filaments cut into pieces) which are then spun into yarns. Whereas conventional polyester yarns consist of only approx. 40 individual fibres, a microfibre yarn has approximately 150 individual fibres. This why fleece made of microfibres is much fluffier than materials made of conventional fibres.



# PACO's New CAD/CAM System

## The Beauty of Technology in 3D



PACO has systematically increased its CAD power to keep up with developments in engineering software. This not only allows design solutions and products to be clearly seen. Combining CAD and CAM also efficiently optimizes the fabrication of our products and subassemblies.

From AutoCAD to Inventor 9 CAD (Computer Aided Design) has long established itself as the "electronic drawing" board in all technically-oriented companies. The latest revolution is the jump in quality achieved by switching from 2D to 3D design. One of the main reasons for this switch is that it helps us to maintain design data compatibility with our suppliers and customers – an essential factor for the success of all concerned. Although, of course, our engineers and designers also like to see how their ideas clearly develop in front of them. 3D provides a far clearer means of conveying the fundamental concept and true quality of a product in the planning stage than was possible with previous drafting systems. That is why the software jump from 2D-AutoCAD to 3D-capable Inventor 9 is so important – and visually so spectacular.

**Practical assistance at a high level**  
The application of high-performance 2D/3D design programs such as Autodesk Inventor Series 9 (AIS 9) have considerably developed traditional drafting techniques. Already drawn shapes can be exactly defined at any time through the subsequent input of dimensions and relationships. This makes the mechanical design and drafting process far more efficient as new ideas and developments can be immediately put into practice and visualised. A special feature is the realistic representation of component surface structures, which give solid models the appearance of digital photographs. The exploded view of three-dimensional components allows the fundamental design and principle of assembly of workpieces and subassemblies to be graphically shown. This not only helps

A clear view: when seen in 3D, the design and construction of PACO filter products is clear at a glance

customers to visualise their product but also reduces design errors and ensures accurate bills of materials.

**CAM – the optimum link**  
Even today, the manual programming of modern CNC-machines is a procedure that is time-consuming, inefficient and a potential source of error. This is particularly the case when the component requires a number of prismatic machining operations. Using CAM (Computer Aided Manufacturing) to program CNC machines provides a number of advantages: shorter machining times, reduced risk of programming errors, increased productivity and assured quality. In other words, PACO's new CAD/CAM system provides benefits all around.

Visit us online!  
[www.paco-online.com](http://www.paco-online.com)

PACO non-woven cloths are primarily used for filter elements for pre-polymer and product filtration – as well as for PACO spin-pack-sieves.



## PACO's Short Guide to Weaving

### 9. Metal Fibre Cloths

Although these cloths are strictly speaking non-woven, we would still like to devote the final installment of our short guide to weaving to them. PACO metal fibre cloths are made up of extremely fine stainless steel fibres or fibres produced from special high temperature and corrosion-resistant alloys.

Extremely small fibre diameters are an important prerequisite for finest filtering with corresponding deep-bed structures. The diameter of the fibres used by PACO goes down to 2 micron. Our cloths generally have a multi-layer structure that is compressed and sintered by being heated in an inert gas atmosphere – this combines the fibres with each other and hardens them.

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## PACO Horizontal Filters Turning Cloudy to Clear!

The filtering of turbidity from fluids is an important processing step in a number of industrial production sequences. Usually a combination of candle and disc filters are used together with filter additives such as silica gel and diatomaceous earth which – together with the turbidity – form a dry sludge on the actual filter.

The basis of this horizontal filter filtration technology are disc-shaped, single-sided filtering elements within a pressure vessel. The circular metallic filter cloth is mounted onto a base plate and fixed at the edge, e.g. with a clamping ring. As the filter cloth is fitted loosely, it naturally tends to corrugate

– to a greater or lesser degree – so that cracks or craters develop in the dry sludge. This reduces the effectiveness of the filtration as it allows turbidity to pass through.

A solution to this problem are PACO filter plates that have particularly dimensionally stable filter cloths and a very high-quality finish. The cloths are fixed by a pre-tensioning system and tightened to a tension that is specifically calculated for the individual plate design. As a further service, PACO can prepare all common makes of horizontal filter and, when required, also provide the complete finishing.

## ADIPEC Abu Dhabi PACO at the Leading Oil and Gas Show in the Middle East

The organizers called their event the “Total Oil and Gas Show”. And they weren’t exaggerating: over 1,200 exhibitors from 54 countries were vying for the attention of more than 22,000 trade show visitors. PACO used the ADIPEC to promote its filter products for the oil production industry as well as its sand separation solutions.

The importance of the show to the region and industry was easily recognised by the fact that the crown prince of Abu Dhabi, his highness Scheich Khalifa Bin Zayed Al Nahyan, personally assumed the patronage of the event that took place between 10<sup>th</sup> and 13<sup>th</sup> October 2004

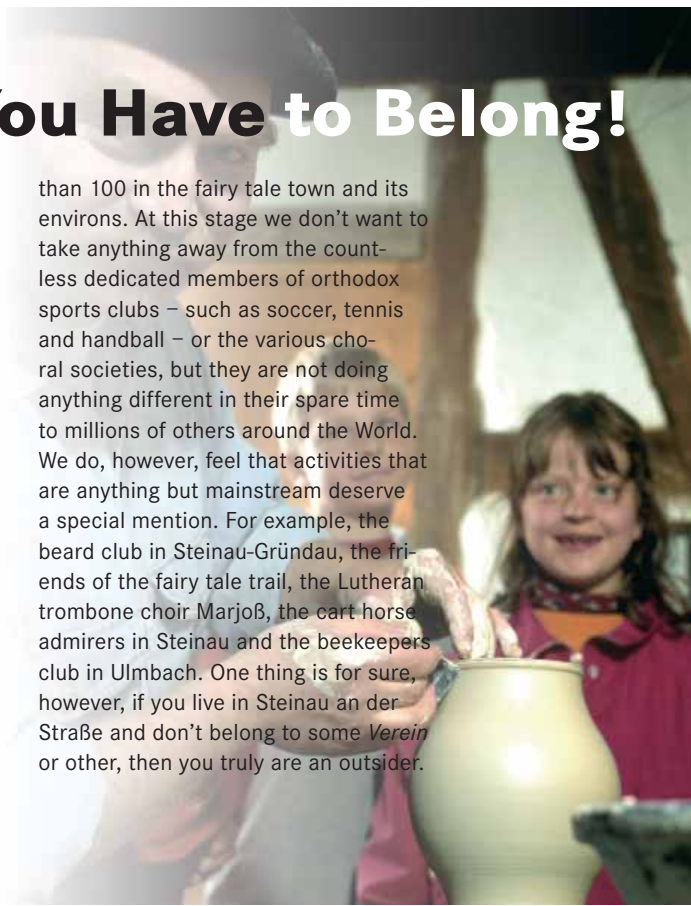


The names of these Gentlemen would not mean much to readers of PACO World. They would, however, recognise the names of the primary sponsors of the ADIPEC show and conference 2004: ExxonMobil, Shell & Total as well as BP etc.

## Steinau an der Straße: If You Live Here – You Have to Belong!

*Verein* is a German word that can only be very loosely translated into English with words such as “club”, “society” or “association”. These, however, can only provide an approximate explanation that is unable to provide the true meaning of the word. The *Verein* is an institution that is important enough to be dedicated its own paragraphs in the German Civil Code, known as the *Bürgerlichen Gesetzbuch (BGB)*. This says that you need to have at least seven persons to form a *Verein*. This means that a town such as Steinau an der Straße, with its population of just over 12,000, has the potential for about 1,700 officially registered clubs, societies or associations. This potential is, of course, not quite reached – but there are still more

than 100 in the fairy tale town and its environs. At this stage we don’t want to take anything away from the countless dedicated members of orthodox sports clubs – such as soccer, tennis and handball – or the various choral societies, but they are not doing anything different in their spare time to millions of others around the World. We do, however, feel that activities that are anything but mainstream deserve a special mention. For example, the beard club in Steinau-Gründau, the friends of the fairy tale trail, the Lutheran trombone choir Marjoß, the cart-horse admirers in Steinau and the beekeepers club in Ulmbach. One thing is for sure, however, if you live in Steinau an der Straße and don’t belong to some *Verein* or other, then you truly are an outsider.



## Bits and Pieces: Pearls of Knowledge – a Bit Different.

There are a lot of people that have said and written-down a lot of common sense. At the same time, there are also a vast number of people that have just not had the time or opportunity to make sense of such extensive wisdom. We feel that it is our duty to do something about this – with pearls of knowledge of a very special kind, viewed through the eyes of experienced businesspersons. Please read these for yourself – maybe you will encounter facts and views that not only appeal to you as an aesthete, but also as a normal working person:

Nothing is amazing for him that cannot be amazed.  
(Brainstorming for R&D)

The mediocre always feels that they are permanently defending themselves to the excellent.  
(May shed light on relationships among colleagues)

There is less courage needed to be the only one criticising than to be the only one praising.  
(Hallo, Boss...!)

I have no regrets says the vivacious, I will regret nothing says the inexperienced.  
(Both views of interest to someone just starting out)

When a firework’s alight, no one looks at the star-spangled sky.  
(The marketing team applaud themselves – and quality assurance look on in awe)

Say something that goes without saying for the first time and you will be immortal.  
(The words of the boss to the advertising manager. Answer Campari, what else?)

*The author of the aphorisms is the Austrian poet Marie von Ebner-Eschenbach (1830 – 1916). The translations and additional comments emanate from the PACO World editorial team.*