

# PACCO

## WORLD



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Our International  
Wire&Mesh Magazine  
for Existing and  
Prospective Customers

## Our Customers – The Winners!

Dear Reader!

What can be better for a supplier than to know that their customers are being successful with the products that they supply? That is why, for example, we were very pleased to hear that one of our customers has just won the German environmental prize. Or when the Ariane 5 safely launches another two satellites at a time into orbit. Or when somewhere in the world, a piece of chocolate slowly melts in somebody's mouth and this was made possible by our sieving and filtering technology (see our main article for more information). Whenever our customers are successful, we automatically share their success.

Our contribution is a quality that helps all of our customers to succeed: an understanding of what they need, wish and want to achieve – at the highest level. Invaluable for this is our extensive experience of a wide range of industries, a variety of processes and numerous technologies. All of this provides a synergy potential from which all of our customers can benefit. As far as we are concerned, the best success is when our customers are the winners in their markets, among their customers and with the juries that judge their products.

Best Regards

Peter Ruppel  
Managing Director



## PACO and Chocolate Production: Extracting Excellence!

Numerous processing stages influence the way that the cocoa bean is transformed into a piece of mouth-watering chocolate. Some of these require demanding sieving and filtering procedures. That is why it is no surprise that you will find PACO sorting things out here. More than that: we have been supplying sieves and filters to the manufacturers and users of chocolate filter presses around the world for a number of years. The fascinating thing about working with cocoa and chocolate producers is not just the technical challenge. It is also about being associated with a craft that has a long tradition which began with the Mayas and Aztecs and has continued with names like C. van Houten or Rudolf Lindt – with no foreseeable end in sight.

**The cocoa bean has a problem:  
it is rather fat**

The Aztecs took their cocoa beans as they found them – after all, they considered them to be a present from Quetzalcoatl – the god responsible for their fertility. When the Spanish conquistador Hernando Cortez arrived to conquer Mexico in 1519, the Aztecs offered him "chocolatl". The extremely bitter taste of the drink made of fermented and crushed cocoa beans was, however, one that he didn't quite readily acquire.

After the Spaniards had brought cocoa back to Europe, it found its way into the homes of the royal families – together with sugar – as a delicacy that was completely beyond the reach of normal mortals. This wasn't to change until the Dutch industrial pioneer Conrad van

Houten recognised that the cocoa bean had got everything that was needed to be a success in the mass market. But first of all a solution had to be found to take the fat out of the cocoa bean. Otherwise, the high fat content would interfere with the intended solubility in water or milk.

**The principle of the cocoa press –  
nowadays a high-tech product**

To take the fat out of the cocoa bean, C. van Houten invented the cocoa press in 1828. Regardless of whether whole beans, de-shelled cocoa nibs or fine nib dust is pressed, the resulting products are the same: yellowish-white cocoa butter and brown cocoa press cake. Today's cocoa presses, which have been perfected through modern technology such as hydraulic operation, electronic control and a high pressing forces in excess of 500 bar, enable the fat content in cocoa to be dropped to only 9%. This compares to a figure of 20% in the days of Van Houten's original press.

The cocoa butter that is extracted using this method is not only used in the production of chocolate. It is also an ingredient in cosmetics (e.g. creams and lipstick) and medicines (e.g. suppositories).

The press cake is turned into cocoa powder which is either sold pure or further processed to produce a range of other products.

**From bean to cocoa powder:  
only the best is good enough**

The quality of the cocoa powder and cocoa butter will, of course depend on the quality of the beans. The best come from equatorial regions of South America and

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## PACO and Chocolate Production

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West Africa. Famous varieties are, for instance, Criollo or Forastero. Nevertheless, no matter how good the beans are, they will not provide satisfactory products when their quality is not matched by that of the manufacturing and processing procedures. To begin with, the cocoa beans are cleaned to remove all extrane-



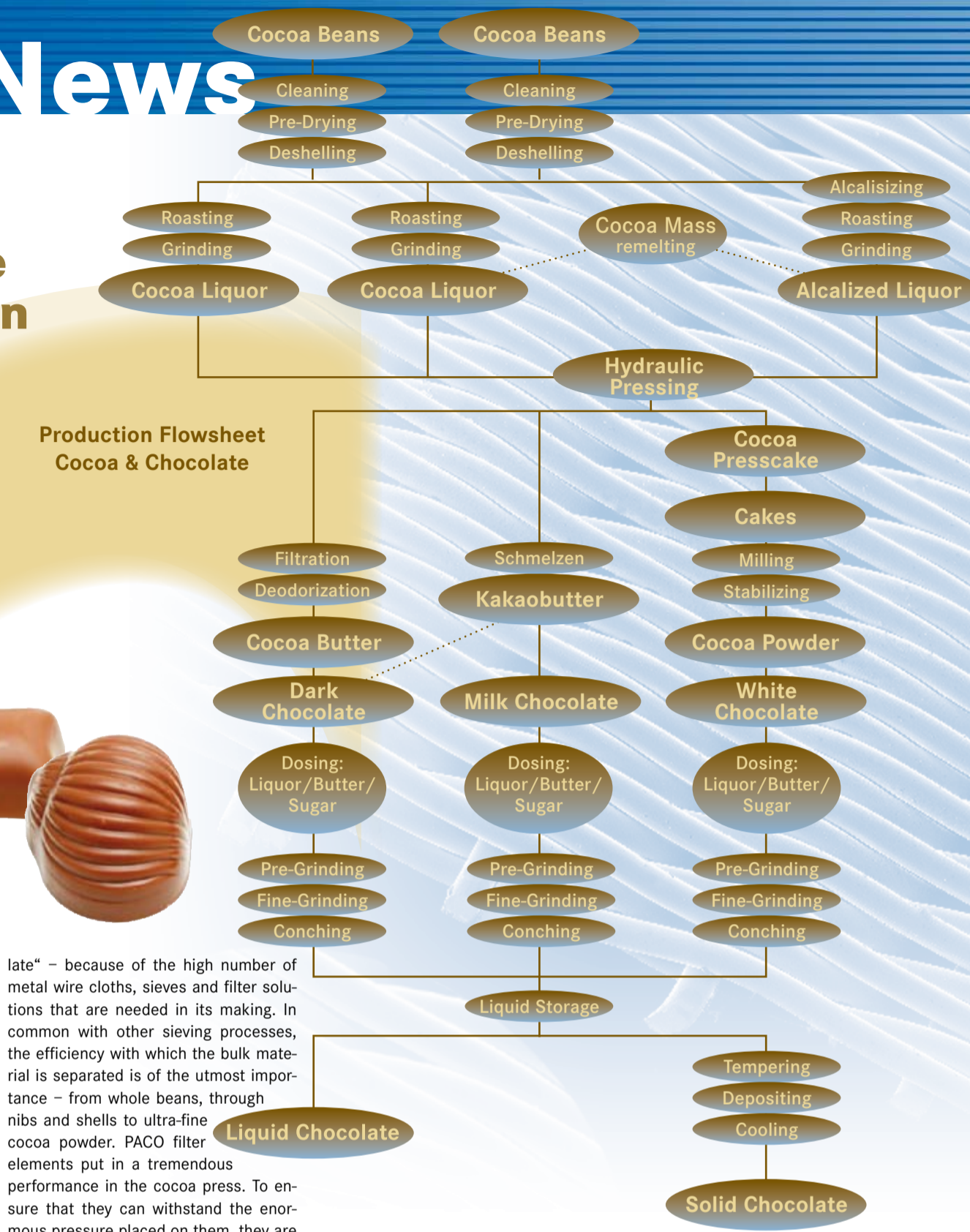
ous material – to all intents and purposes, the first sieving process. In most cases, the beans are then roasted to intensify their aroma and bring out the typical cocoa colour. Following this, the roasted beans are broken open and sieved again to separate the so-called nibs from the shell remainders. The cocoa nibs are then milled to form a liquor and heated to 70 °C or more. Due to the high fat content, heating will cause the liquor to become thinner so that it can be efficiently pumped into the cocoa press. And this is where both product and processing technology are tested to their extremes: the cocoa butter is literally pressed out of the cocoa liquor.

Depending on the desired residual fat content, a pressure of up to 1000 bar will be exerted on the press cake. This not only places an intense load on the mechanics of the cocoa press, but also on the filter media that separates the cocoa butter from the press cake.

Finally, further sieving and filtering operations are needed to produce the cocoa powder and further process the cocoa butter.

### PACO solutions for cocoa and chocolate processing from A - Z

When you take a closer look at a bar of chocolate, you could also call it "PACO-



### Production Flowsheet Cocoa & Chocolate

late" – because of the high number of metal wire cloths, sieves and filter solutions that are needed in its making. In common with other sieving processes, the efficiency with which the bulk material is separated is of the utmost importance – from whole beans, through nibs and shells to ultra-fine cocoa powder. PACO filter elements put in a tremendous performance in the cocoa press. To ensure that they can withstand the enormous pressure placed on them, they are inserted in layers. The basis is formed by PACOPERF perforated supported discs, PACOMESH woven support and backup screens and PACOSCREEN woven filter cloths. They are mounted onto filter plates that are individually designed for each specific type of press. The most commonly used filter cloths are PACO SIMPLEX, PACO DUPLEX and PACO TRIPLEX (for specifications, please refer to [www.paco-online.com](http://www.paco-online.com)). The 1.4016 (T430) material that is used these days for the metal cloth is magnetic. This means that should the combination of high pressing force and material fatigue cause a metal

wire to break, any metal fragments can easily be removed from the cocoa with corresponding magnetized tools.

**The final step: welcome to paradise!**  
One of the secrets of the success of cocoa is that it harmonises so well with other aromas. Apart from its long-standing companion sugar, these include cinnamon, cloves, cardamom, coffee or vanilla. The Aztecs also combined their "chocolatl" with extremely hot chillies, a taste that has come back into fashion among chocolate gourmets. Cocoa drinks remain popular among young and old

alike. And what would a cappuccino be without a topping of cocoa powder?

The highest form of artistry and craft of the chocolatier are, of course, products such as pralinés, petit fours, confectionery products and a number of desserts. It is, therefore, no surprise that the leading manufacturers of cocoa presses come from the countries that are renowned for their cocoa and chocolate products: for instance, Italy, the Netherlands and Germany. At PACO, we are familiar with the manufactures of cocoa presses – and also the sweets and candies that their machines help to produce.

## PACO Factory Herolz: Expanding Capabilities with an Additional Area of 1800 m<sup>2</sup>!

At the end of January 2007 a further phase of the factory extension at the PACO site in Herolz (between Frankfurt/Main and Fulda) was commissioned. This consists of additional storage area that increases capacity to 1800 m<sup>2</sup> and a new office building with 200 m<sup>2</sup> space for the accounting and human resources departments.

**Increased flexibility and speed**  
The increase in the storage area at our Herolz factory is primarily intended to allow more metal wires to be stocked

so that we can react faster and more flexibly to the needs of the market. At the same time, the space that has been freed up after moving our stores can be

used to expand our manufacturing operations. Before the end of 2007, eight high-performance looms built by our own engineering group will be installed and put into operation. In this way our weaving and processing capabilities will be substantially increased. And the staff in our accounting and human resources departments are also looking forward to having more space to work in.

To keep up with the needs and wishes of our customers, PACO has substantially increased the metal wire storage area. At the same time, production capacity at the Herolz site has also been expanded.





# PACO with Damavand at the EXPOKISH 2006: Kish Island – the Dubai of Iran

Iran is not a destination that is readily associated with mass tourism, despite its beaches, sun and rich history. However, for the oil industry and its suppliers, trade shows in Iran are among the most important in the world. That is why PACO was represented with a stand at the EXPOKISH 2006.

## Jewel in the Persian Golf

Kish Island is situated in the Persian Golf approx. 20 kilometres away from the Iranian mainland. It takes about 45 minutes to fly there from Dubai. Teheran is about two hours flight away. Kish Island has the status of a free trade zone with special tax concessions. That is why the one and a half million visitors that it attracts each year view it as a shopping paradise. The Iranian government has

started a campaign to economically develop Kish Island as a rival to Dubai. Part of this plan is the establishment of an oil bourse trading in petroeuros.

Tourism is very important for the approx. 16,500 inhabitants of Kish. Even the shah of Iran spent his vacation there. There is no shortage of luxury hotels. Although everything is very westernised, the strict ban on alcohol remains very much in force. And women still bathe on the beaches behind high corrugated iron fences.

## ENEX 2006 – 3rd International Exhibition of Energy

For the third time, the ENEX invited an international audience of energy professionals to Kish Island. Between the 14th and 17th November, the island's exhibition halls provided the state-of-the-art backdrop to show off the latest technologies, services and equipment for the oil, gas and petrochemical industries. PACO was also represented on a stand together with its Iranian joint-venture partner Damavand. They showed a range of products that are of specific interest to the energy industry, which included metal wire meshes, sieving frames and filter elements for the petrochemical industry.

Known and respected as a force The reaction at the exhibition showed that the attention that PACO has paid to the Iranian market for a number of years is definitely reaping rewards. Particularly the joint venture with the local partner Damavand – together with a continuous

ramping-up of production in Iran – has had a very positive effect. PACO/Damavand are already very well known and have a large market share. Further to this, PACO's high standard of quality is widely recognised and valued. This meant that the joint exhibition stand was very busy – and elsewhere around the ENEX there were plenty of opportunities to come into conversation. A number of interesting options on orders were negotiated that should come to fruition during the course of this year.

[www.expokish.com](http://www.expokish.com)



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

# American Textile Machinery Exhibition: PACO at the ATME-I® 2006 in Atlanta, Georgia (USA)

The ATME-I 2006 presented itself once again as the largest event of its kind in the Americas. It is considered to be the number one exhibition for textile machines, equipment, accessories and services for manufacturing textile

fibres and yarn as well as for weaving and knitting etc. PACO was there together with their partner Petree & Stoudt to show solutions for the filtration of liquefied polymers that are used to produce synthetic fibres.

# International Phosphate Conference: PACO Subsidiary CANAL Shows Their Experience in Morocco

The imperial city of Marrakech was the venue for "The Second International Conference on the Valorization of Phosphates and Phosphorous Compounds". Once again the event was organised by RECHERPHOS (Researcher's Network on Phosphates). The Belgian PACO subsidiary CANAL Engineers, a company that has had considerable experience with phosphates, fertilisers and the African market, was represented with a stand of their own at the conference.

## Top-class stage

It is no coincidence that the COVAPHOS II was staged in Morocco. After all, this North African country is home to more than half of the world's presumed reserves of the raw material phosphate. The problem that the country has had until now, however, was that the majority of the phosphate that was mined left Morocco unprocessed. As this meant an unsatisfactory level of returns, the conference looked at new strategies which would be more lucrative for the domestic industry. Once again, the organisers succeeded in bringing together scientists, industry and technology suppliers interested in phosphates and phosphorous compounds around a single conference table.

The main subjects discussed during the event were, for example, the geology of phosphate, the theoretical and practical usage of phosphates, phosphoric acids in the chemistry of fertilisers, application of fertilisers, phosphorous and biological materials and protection of the environment.

## Numerous delegates

CANAL Engineers used the conference as an opportunity to present their products.

The CANAL stand was very busy. This pleased managing director André Brassine (middle) as well as the visitors.



ucts. Around 300 delegates from 24 countries were in attendance. Approximately two thirds were scientists and the other third were from industry. The quality of the event can be judged by the fact that all of CANAL Engineers' important customers from North Africa and the Middle East participated. The exhibition stand was very busy, with visitors expressing a particular interest in Dutch weaves for sulphur filtration, perforated sheet segments and elements for filtering phosphoric acids as well as fine dust separators. The numerous conversations served not only to intensify existing customer relationships but also to promote CANAL Engineers and PACO as qualified partners for the phosphate and fertiliser industries.



At the ATME-I approximately 1000 exhibitors presented their production lines, machines and products for textile fibre manufacturing. PACO together with its partner Petree & Stoudt, devoted itself to the subject of filtration.

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PACOSLOT wedge wire screens are valued by brewers because of their quality, reliability and product safety. Their qualities are also appreciated in a wide range of other applications such as coolant filtration, resin traps and nozzle filters.

## PACOSLOT Wedge Wire Screens: Reliable Tools for the Finest Beers

Germans take pride in their beer. That is why the centuries old *Reinheitsgebot* (purity law) only allows the purest ingredients. But these alone are no guarantee for the finest beers – the manufacturing process also has to ensure utmost purity. PACOSLOT wedge wire screens stand for ultra-pure processing technologies and filtering results – not only for breweries.

### The joins are the key

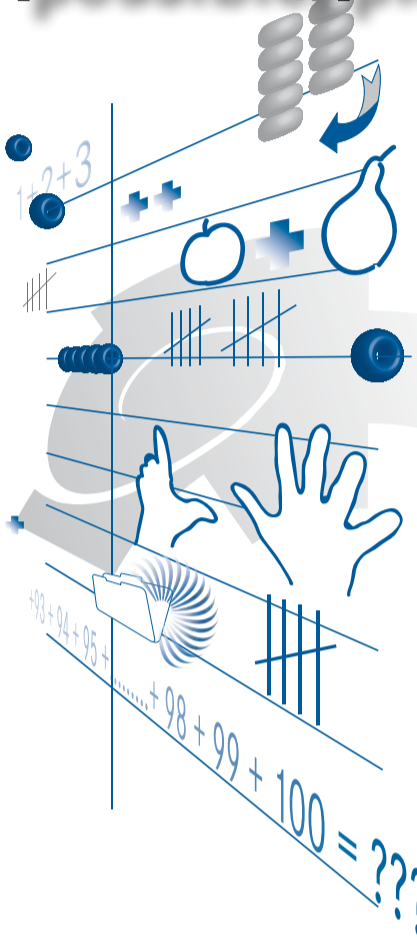
PACOSLOT wedge wire screens have a spirally running surface structure with axially arranged supporting sections at the cross-over points. These joints are welded without the use of any additional materials and are, consequently, extremely pure! The lengthy experience that has been gained using optimised processing parameters ensures that the material structure of the shaped wires will remain unchanged. PACO's joining expertise in combination with leading-edge production equipment has been perfected to such a fine art that wedge wire screens with a slot width as small as 25 µ can be produced with extremely fine manufacturing tolerances. The specific design concept of a wedge wire filter depends on the selected material, the required filtering direction (from outside to inside or inside to outside) and particularly the hydraulic qualities and associated mechanical requirements.

### All clear for beer purification

The PACOSLOT wedge wire screens used in the production of beer have an outer diameter in the range of 27 to 37 mm with lengths between 800 and 2400 mm and slot widths between 40 and 80 µ

Filtration occurs with the help of an additional filtering layer of sediment that collects on the PACOSLOT element with the PACOSLOT initially acting as the carrier material. The precision of the PACOSLOT wedge wire screens enable the fast and effective bridging of the sediment. The beer filtration itself occurs through a separation of the liquids and solids, whereby the fluid to be filtered flows through a porous body created by the additional filtering layer. This traps the turbidity – which with beer is primarily the yeast cells and protein-tannic acid complex as well as precipitations such as oxalate crystals and hop resins. The filtering sediment is removed by reversing the flow.

## Add the numbers from 1 to 100 – as quickly as possible, please!



One plus two is three, plus three is six, plus four is ten, plus five is... – it'll take a long time before we've added all hundred integers together – won't it?

That's what a primary school teacher thought in 1784 as he wanted to keep his pupils busy for an hour or two. But he hadn't taken one of his pupils into account – the seven year old Carl Friederich Gauss. He put up his hand after just a few minutes and said what the correct answer was: 5050. As his teacher enquired how he had worked out the answer so quickly, the little Gauss replied: "it's quite easy:

- 1 + 100 = 101
- 2 + 99 = 101
- 3 + 98 = 101
- 4 + 97 = 101
- etc. etc. until
- 50 + 51 = 101.

in total, 50 equations can be formed that always equal 101. And 50 x 101 is 5050."

Would you have been able to work out the answer so quickly? Somehow, when it comes to solving a problem, we always seem to take the more laborious and long way round. But looking at a challenge or problem from a completely different point of view can often save a lot of time and effort. And to do that you don't need to be another Carl Friedrich Gauss who, even during his lifetime, was titled the "Prince of Mathematics". The creative capability of changing the order of things to reach innovative solutions is something that can be very helpful to us in our everyday working lives.

*Carl Friedrich Gauss, 1777 – 1855, mathematician, physicist and astronomer. In all three disciplines his work paved the way for developments that we know today.*

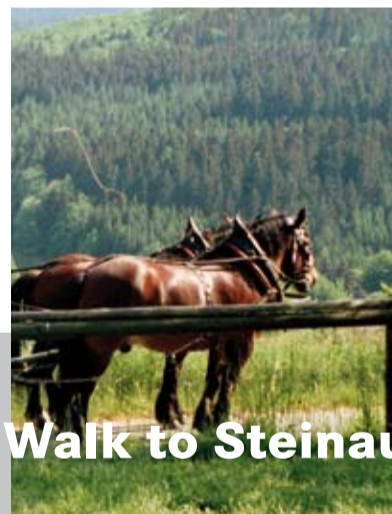


## Steinau an der Straße: The Donkey's Way – You Can Also Walk to Steinau!

More than two thousand years ago, tracks and roads were already providing the infrastructure for cultural exchange and the flow of trade. One such old-established transport link is the Eselsweg (Donkey's Way). This runs for 111 km from Schlüchtern, in the Main-Kinzig district of Hesse, through Steinau an der Straße and the beautiful Spessart forest to Großheubach in the Bavarian district of Miltenberg.

Today a very popular hiking route In times past, celtic warriors, roman merchants, bishops and counts with

their entourages, knights, craftsmen and peasant journeyed along the way. Incidentally, the name refers to the medie-



val caravans that used the backs of donkeys to transport salt from the saltworks at nearby Bad Orb.

Today the Donkey's Way is a popular hiking route. This is particularly because of the romantic path that it takes: 111 km running almost exclusively through old beech and oak woods at an alti-

tude of between 400 and 500 metres, without valleys (in other words, easy to walk along) and to each side charming towns and villages full of picturesque architecture and rich on history.

[www.walk-in-europe.com/germany/donkey-way](http://www.walk-in-europe.com/germany/donkey-way)

## PACOs Short Guide to Manufacturing



Work at PACO is characterised by a variety of different production techniques. We present the most important of these in a series that appears periodically in the next few issues of PACO WORLD:

### 4. Welding and other joining techniques

As every day as the joining technique called welding appears to be, it nowadays takes on a number of different forms. At PACO "the non-detachable joining of two components through the application of heat and pressure" is interpreted in a variety of ways. In each case, high process reliability and welding quality is combined with innovative welding process control and quality assurance. The welding techniques used by PACO include: plasma welding, tungsten plasma welding, electron beam welding and wolfram inert gas welding. Other joining techniques include soldering, sintering and gluing.

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