Bon appétit
An effective refrigeration chain ensures the perfect treat

Pure elegance
The new Artega with an all PU body

A strong team
Our partners on the Bosphorus
Dear readers,

The quake in the international financial markets is making waves worldwide. And it is not just affecting individual countries – the global economy in continents like America, Europe and Asia are also suffering under the recession.

Therefore, ELASTOGRA\n\nfinds itself faced with a completely new market situation that no one saw coming. Like other European-wide operations, we are also feeling the pressure, uncertainty and restraint when it comes to our customers’ existing or planned projects. And like all other companies, we are working on solutions so we can steer ourselves efficiently and surely through these difficult economic times.

The driving force of our commitment is now, as ever, the creativity and innovation of ELASTOGRA\n\n, which has been setting the standard for decades in the worldwide PU business. These ideas and products put our customers, even in difficult times, in a position to carry on their businesses successfully. And alongside our customers, we understand that the challenge is to explore new paths and look to the future, putting us in an even stronger position than we were in before.

In this new edition of PUR magazine, we will show that this philosophy not only presupposes consumer behaviour, but also offers a proactive approach to the situation. Whether in the automotive industry, coastal defence, insulation and transport, shoe fashions or hotels: Ideas and materials from PU will enrich our lives in the future, because they create a genuine increase in value – for producers and consumers. We hope you enjoy discovering the new possibilities.

All the best,

ELASTOGRA\n\nand the PUR editorial staff
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We can do it!

We talked to Dr Uwe Hartwig, Managing Director of Elastogran GmbH, about the credit crunch and opportunities for the financial year 2009
PUR: Dr Hartwig, what is your personal take on the current situation?

UH: These days we have to deal with a new situation almost every day. Yet the estimates from the economic research institutes and printed in technical journals show a clear downward trend.

PUR: But is the credit crunch already a reality for the consumer?

UH: Yes it is. There’s also a strong psychological factor in play. Consumers start getting used to the credit crunch and become more reserved in what they buy, particularly in the case of larger investments. That has a clear effect on our core industries, such as the automotive and building industries.

PUR: To what extent is the current crisis a reality for ELASTOGRAN?

UH: After three excellent years, there was a drastic collapse in sales in the fourth quarter of 2008. However, it’s important to remember that many of our customers are reducing stock and current production is lower than material demand. On top of that, some of our suppliers have had liquidity problems and prices have been unstable – issues that are reflected all along the supply chain.

PUR: How will ELASTOGRAN react to get through this difficult phase?

UH: We are well prepared because we have some crucial advantages. The most important thing is that we can operate in a flexible way.

Firstly, we are not dependent on one industry. There are markets, such as medical technology and cosmetics, that are almost unaffected by the credit crunch. In addition to our diverse portfolio, we are established in a regional way. Our systems house strategy is very valuable, as we already have a local presence in the trend growth markets in Eastern Europe, as well as in the Middle and Near East.

And of course we hold in-depth meetings with all our customers to work on individual solutions – including anything from changing payment dates to new and improved systems, or alternative products.

PUR: What does “innovative capacity” mean for ELASTOGRAN now?

UH: “Innovative capacity” is the key to our success, as we are able to react quickly to new customer needs. We are also seeing a real openness from our customers to work on innovation projects together to open up new market segments and promote new technologies, such as wind or solar energy.

We are also thinking about what happens after the credit crunch. And of course, we want to be at the very forefront if there is a general upward trend. After all, only the most creative companies can really drive economic dynamics.
…And in the new footwear magazine, Go!, you can see how.

In this year’s first issue of Go! (1/2009), you’ll see that the fascinating concept shoe made completely out of PU, pure 1:0, caused a stir at the SIMAC in Bologna. With over a dozen special polyurethane applications for each individual shoe component, ELASTOGAN impressively showed the kind of technical and optical finesse that’s possible these days using PU. Plus the new footwear newsletter from ELASTOGAN successfully highlights the role PU plays in the worldwide shoe industry. To find out more, just take a look at Go! – it’s all in there, step by step.

Join the safe side

A new brochure, Walk the Talk, is helping to clean up careless behaviour on the job in the chemical industry.

Around 80 per cent of all accidents in the chemical industry are a result of the incorrect or careless handling of chemicals. In order to reduce this potential risk and even eliminate it completely in the future, the European Disocyanate & Polyol Producers Association, ISOPA, have created the industry-wide safety programme Walk the Talk.

There is now a new, updated brochure, which shows how everyone involved can safely achieve greater efficiency, with less risk. For further details, check out the review at www.isopa.org/walkthetalk or simply e-mail main@isopa.org. With Walk the Talk, you’ll always be on the safe side.
Wheels in motion

The introduction of our new Elastofoam® I steering wheel in January 2009 has led to a 30 per cent increase in our capacity for steering wheel production.

The soft integral foam has been successfully used for a long time in steering wheel sheathing, as it possesses outstanding tactile properties suitable for all kinds of vehicle. Adopting it means that we can achieve a 30 per cent increase in efficiency without changing our machines or technology. So depending upon production capacity, this could translate into a few million quality steering wheels every year.

This is made possible by a new PU formula with improved fluidity, which reduces the need for re-machining and allows the wheels to be removed from the mould much more quickly. In addition, it means that steering wheels with even lower volumetric weight can be made with the same properties. And last but not least, the surface lassitude desired by the automobile industry has also been improved thanks to a coordinated release agent variant.

NaWi – how does it work?

It’s simple: With 60 scientific experiments, ELASTOGRAN has been answering chemistry questions for primary school children.

Education is no longer just a matter for governments. Companies have long recognised this, and are investing in future knowledge with private initiatives and partnerships. That’s why ELASTOGRAN has been supporting the project “NaWi – geht das?” from the Wissensfabrik Deutschland (knowledge factory Germany) for over a year.

As part of the project, BASF and other companies are sharing their knowledge to help educate children. Chemists from the research department at ELASTOGRAN have provided a special box containing 60 simple scientific experiments to a total of 15 primary schools. Plus more than 200 teachers were trained by ELASTOGRAN employees in order to instil a passion for chemistry in children throughout the whole region. The project has been in the press too, and weekly journal DIE ZEIT visited Lemförde primary school to see the successful implementation of the project for themselves.
Excellent design, high performance – with the arrival of the Artega® GT, a true highlight of the sports car scene slips into the fast lane. The breathtakingly styled coupé is enhanced with a unique synthesis of performance development, consumption, operating range and travel efficiency; a podium finish in the 300-HP league. But that’s not all. As a worldwide first series vehicle, the Artega has a body made completely from PU – giving it a consistent focus on lightweight construction.

Flashback: Geneva motor show 2007. The prototype of the Artega celebrates a brilliant premiere. The professional world and visitors alike are enthralled by the new German sports car, weighing just 1,100 kg and, with a power/weight ratio of 3.72kg/HP, setting new standards in its class. The Artega now has exactly what the prototype of the
Gran Turismo embodied in the 1960s: concise dimensions, ample room for the journey, a sporty engine and, because of its lightweight construction, a high degree of agility. Although it is not a “super” sports car, its values in driving dynamics mean, it can easily take them on and go even further with its captivating qualities in long-distance performance and everyday use. In short: It promises driving pleasure of the highest degree.

300 horses underneath, a layer of PU on top – that’s how you achieve 0 to 100 in 4.8 seconds

Apart from the 300-HP-V6 engine and the elegant, comfortable direct shift gearbox (both from Volkswagen), everything in the Artega is new. The goal of the sports-car-smiths at Artega, in the Westphalian town of Delbrück, was to develop

**Technical data of the Artega GT**

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<tr>
<th><strong>Motor:</strong></th>
<th>V6 direct injection in the rear</th>
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<tr>
<td><strong>Cubic capacity:</strong></td>
<td>3,597 cc, 220 kW (300 HP)</td>
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<tr>
<td><strong>Dry weight:</strong></td>
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<tr>
<td><strong>Power/weight ratio:</strong></td>
<td>3.72 kg/HP</td>
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<tr>
<td><strong>Drive:</strong></td>
<td>six gears direct shift gearbox</td>
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<tr>
<td><strong>Acceleration:</strong></td>
<td>4.8 s (0–100 km/h)</td>
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<tr>
<td><strong>Top speed:</strong></td>
<td>270 km/h</td>
</tr>
<tr>
<td><strong>EU-unit consumption:</strong></td>
<td>8.9 l (Super Plus)</td>
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<tr>
<td><strong>CO₂ emissions:</strong></td>
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</tr>
<tr>
<td><strong>Range:</strong></td>
<td>765/900 km (68/80 l Tank)</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>401 x 188 x 118 cm</td>
</tr>
<tr>
<td><strong>Wheel base:</strong></td>
<td>246 cm</td>
</tr>
<tr>
<td><strong>Boot volume:</strong></td>
<td>300 l</td>
</tr>
<tr>
<td><strong>Price:</strong></td>
<td>75,000 Euro</td>
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a sporty vehicle that’s also suited to everyday use, with well-engineered, high-volume components. The experts at ELASTOGRAN were consulted in order to implement the carbon fibre-reinforced PU component in the motor-racing-approved material combination of aluminium and high-strength steel. Working in close cooperation, the polyurethane lightweight construction body was developed, which today is made by experienced customers and partners, such as Erwin Friedmann Kunststoffwerk GmbH, Offenburg, and Automobil- und Kunststofftechnik GmbH, Hörselberg.

The combination of various polyurethane materials with outstanding mechanical properties makes the sleek two-seater genuinely lightweight and offers the additional advantages of cost and safety. Wings, tailgate, front and side parts of the sports car consist of Elastolit®, the carbon fibre-reinforced, microcellular PU system, which is characterised by a high degree of robustness and good impact strength even in extremely cold temperatures.

So light – so good. Using Elastolit, car body components of enormous accuracy are achieved that are resistant to deformation.

Using Elastolit as part of RIM-technology (Reaction Injection Moulding) has been proven to allow the construction of parts that have a distinctive, inherent rigidity and a narrow wall thickness. The low thermal coefficient of expansion of the fibre-reinforced polyurethane system provides for a high fitting accuracy and an extreme thermostability of the construction components. Due to its high surface quality, the lightweight construction material is ideally suited to the Class-A-lacquer finish of visible free-formed surfaces. In the roof, boot and bonnet, special polyurethane material combinations with sandwich constructions are used, which are characterised by an even higher degree of torsional rigidity with a light weight. All these advantages, which are also present in the back-foamed bonnet, are possible thanks to the polyurethane compound structure.

Injected for one second, hardening over 15 to 30 seconds – finished. This even applies to highly complicated, filigree construction units.
Many of the polyurethane body parts used in the Artega are manufactured using RIM procedures. The two-component, liquid, fibre-filled and highly reactive polyurethane system Elastolit is injected in one second into a closed tool. After just 15 to 30 seconds the finished construction unit can be removed from the mould, maintaining its high quality. In contrast to conventional injection moulding procedures, the PU RIM materials are fluid during the reaction and possess outstanding flowability properties. These are essential conditions for the realisation of complicated construction unit geometry and filigree design standards.

Pure sports car driving pleasure without purist ambience. Even in this dimension the new Artega GT is in a class of its own

The lesson is clear: The Artega is a “pure” sports car, without being purist. The subject in question is the beginning of a new car brand, creating something totally new without the constraints of the past. In all areas, the Artega is aligned with the established processes of mass production. Apart from the extraordinary development costs, this claim is especially apparent in the construction of the new 6,000 sq m car factory in the Westphalian town of Delbrück, where, for example, industrial processes in low volume production are carried out. Artega deliberately does not work in the sense of manufacturing according to the workshop principle, but rather in line manufacturing similar to mass production.

Just one more thing to say: The facts are clear – get in the Artega, start it and drive off – because every yard you cover will be much more convincing than anything else we could say.

- Elastolit: fibre-reinforced polyurethane system for the production of highly rigid body parts
  - Enormously robust
  - High impact strength
  - Distinctive rigidity
  - Narrow wall thickness
  - Boundless design freedom
  - High surface quality
  - Optimum flow properties
  - Quick removal from mould
  - Optimum removal procedures from mould – extreme thermostability
  - High degree of fitting accuracy
  - Very easy to process
  - Ideal for low volume and special series
Leading the way in refrigeration insulation

How PU helps to bring our much loved delicacies to the consumer in the freshest possible condition

Whether it’s red mullet, South African strawberries, Argentine steaks, French poussins or prawns from Greenland – ELASTOGRAIN’s PU systems deliver perfect insulation to ensure our much loved delicacies arrive ice-cold through environmentally friendly refrigeration that cuts expensive wastage. The systems are designed to work effectively throughout all stages of the refrigeration chain – and they are suitable for much more than fine food. PU systems are also ideal for transporting sensitive items such as medication, as the insulation provided is so efficient.
A vital link in the refrigeration chain

The refrigeration chain incorporates the complete process of storage and transport from the producer to the consumer, and an effective chain guarantees the constant maintenance of the ideal storage temperature for the product transported. The more sensitive the commodity is (for example units of stored blood or perishable food), the faster the cool-boxes must connect to the terminal or onward transport.

The most crucial aspect for producers, hauliers and consumers alike is a refrigeration system that is both efficient and protects resources. This can only be achieved through perfect insulation of refrigeration containers, whether they are boxes, hangars, cupboards or shelves. And it is in this field that the PU systems of Elastopor® H, Elastopir® and Elastocool® lead the way.

Welcome to the next generation of refrigeration technology

As the need for high quality, cost-effective refrigeration
transportation that cares for the environment increases, so does the demand for high performance materials that really deliver at every step of the refrigeration chain. ELASTOGRAIN’s Elastopor, Elastopir and Elastocool materials all combine greater insulation capacity with innovative technology to guarantee superior refrigeration.

16:1 – the factor you can count on

Our intelligent polyurethane hard foam insulation systems offer greater sustainability, economy and environmental protection. But how?

Saving energy

When one euro pallet of deep frozen goods travels through the entire refrigeration chain – from the manufacturer’s deep-freeze storage depot all the way to the consumer – 16 times more energy is saved (than was used during production) when PU insulation is used. That’s an energy conservation factor of 16:1.*

In other cases the saving can be greater still. In supermarket freezing, the energy conservation is 25:1 and in refrigeration and freezing combination systems, the factor is 20:1.*

Cutting CO₂ emissions

PU insulation reduces CO₂ emissions by more than 13 per cent, as well as saving on resources by over 12 per cent.*

Green is gold

Bringing ecology and economy together under one roof is not that difficult when you already have the right people with the right ideas. Our people have developed the most groundbreaking polyurethane hard foams – Elastopor H, Elastopir and Elastocool – for use in deep-freeze halls, deep-
freeze transport, transport containers, refrigeration cells, supermarket freezers, refrigeration and freezing combination systems and even the smallest of medical transportation boxes.

A fresh forecast

As consumers demand more, transport becomes faster and more efficient; and as saving money, energy and the environment become even more important, the future will allow only the very best refrigeration chain solutions and products. After all, it’s these products that will add value to companies and their customers.

ELASTOGRAIN’s rigid foam systems are clearly the first choice for sustainability, efficiency and cost-effectiveness. They are the systems of the future.

*The basis for these results are the current conditions of PU insulation against the lowest insulation strength available on the market today. Data established in cooperation with Öko-Institut, Freiburg.
Whether it is pizza, fish fingers, fruit or vegetables – when it comes to quality, taste and vitamin content, frozen food simply cannot be beaten.

Professor Dr Jörg Oehlenschläger is the scientific director of “Convenience”, a study by the German agricultural society Deutsche Landwirtschafts-Gesellschaft (DLG). He says: “When food is frozen immediately after production or harvest, the fresh qualities are sealed in during the deep-freezing process. After thawing, they are to a large extent unchanged.”

The testers at DLG also concluded that “frozen food in some product groups were predominantly judged to taste better than fresh food”. This fact is also naturally reflected in the market, and as a result, the total consumption of frozen vegetables increased in 2007 to almost 464,000 tons.

For fish, this figure was 299,900 tons, and in the case of ever-popular fish fingers, the figure was enough for every German to have eaten 23 of them – that's a total of 1,885 billion Knuspersticks! These are prepared according to the most modern nutritional and hygienic standards, with high-quality ingredients such as protein, iodine, iron and vitamins A and D. And just like fruit and vegetables, there's no comparison with non-frozen food with regard to taste, freshness and vitamins. And of course they're available all year round – so they are much quicker to prepare.

Cold has always played an important role in the preservation of food or wine: Alexander the Great had pits filled with ice during the Persian War to keep troop provisions fresh for longer, and Emperor Nero used snow and ice from the Apennine Mountains to cool fruit. But it was only some two millennia later that the victory march of frozen food began.

We have seen many important inventions in the area of refrigeration, such as the refrigerating machine by John Garry in 1844, the first absorber refrigerator by Ferdinand Carré in 1860 and the first refrigerator with ammonia liquefaction by Carl von Linde. And of course, the observations made by biologist Clarence Birdseye in Labrador – he saw how natives caught fish and froze them immediately at −45 degrees. Cooked later, they tasted as if they had been caught fresh.

Clarence Birdseye’s observation was later implemented by the Danish fish importer A.J.A. Ottensen. His idea: brine with a salt content of 28 per cent. With help from this and new refrigerators, fish could be frozen in just one to three hours, at −20 degrees.

This development was the starter gun in the race for the industrial production of frozen food. However, it was only around 1930 that the first frozen products were available in a supermarket in Springfield, Massachusetts. And it was some decades later before complete frozen menus were on sale in Germany.

Ice-cold truths

About taste, vitamins, tonnages and the track record of frozen foods
We always do really well...

With a wealth of first-class materials and intelligent detailed solutions, ELASTOGRAIN has been delivering efficiency and security to the offshore industry for many years.

Companies working within the offshore industry operate under severe pressure and need solutions that perform far beyond the norm. Clients can rely on ELASTOGRAIN’s solutions to function under the most extreme conditions.

The solutions that rise to the challenges

Every day the offshore sector faces hundreds of risks and dangers with the potential to ruin a project and even a business. ELASTOGRAIN’s PU systems Elastoshore®, Elastopor® H and Elasturan® help counteract these risks with their proven reputation for performing effectively under the most difficult conditions for the toughest industrial uses. Their characteristics set them apart and include flexibility, resilience, longevity, thermal insulation and impact strength.

Valuable qualities

These qualities are worth millions, as offshore laying barges cost up to US$ 500,000 a day (so breakdowns are incredibly expensive). Every second counts during the laying of long pipes under water, which is why ELASTOGRAIN’s PU offshore systems harden extremely quickly.
Perfect pipeline protection with intelligent polyurethanes

Tides, currents, storms, waves, corrosion and problems such as barnacle infestation exclude the use of many materials, which entails interruptions to production and high costs. Applications using PU have a clear advantage, as they are more versatile and robust than most other materials.

Huge possibilities

Ultimately, ELASTOGRAF’s solutions perform no matter where, how or at what depth they’re put to use. They can handle all types of currents, high-risk maritime issues and elements – and better still, they take it all in their stride.

Elastoshore. For stable pipeline connections. Elasto-shore joints guarantee the stable thermal and mechanical protection of pipelines at the welding seam. They have excellent elasticity and impact properties, short hardening times and offer longevity, even under the extreme conditions of the depths of the ocean.

Elastoshore GSPU. For safe thermal insulation and compressive durability of deep-sea and ultra-deep-sea pipelines. Elastoshore GSPU is a new generation of glass-syntactic PU for pipeline insulation. Containing no heavy metals, it’s a high performance material, which is very reliable, even under extreme stresses and high hydrostatic pressure.

Elastopor H. For the safe insulation of pipes – even under the most extreme circumstances. Elastopor H is also used for “sub-sea pipelines” due to its excellent insulating properties. In depths of up to 200 metres, Elastopor H sets the standard in insulating properties, temperature stability and solidity of the polyurethane foam.

Elastopor H opencell. For the protection from mechanical destruction, e.g. by dragging anchors and trawl nets. The opencell polyurethane foam with its high gross density becomes fully saturated with seawater in order to prevent the floating of the pipeline.

Elasturan. Up to five tons of heavy elastomer casting can be used to create “bend-stiffeners”. These stiffeners take the pressure of the enormous tensile and bending forces that affect the pipeline to protect it against destruction. Strakes made from Elasturan ensure that the pipeline does not oscillate. Available in a wide hardness range.
| **Strake** | Helix-shaped elastomer-moulded part that vertically drains off high horizontal water flow velocities and ensures that the pipeline does not oscillate. |
| **Pig** | Pig systems and components examine, clean and maintain the pipeline without interrupting the process flow. |
| **Doghouse** | Protective cover to guarantee the physical and thermal stability and functionality of the pipe and production system. |
| **Flowline protection/Cable protector** | Cast elastomers to protect the pipeline. Compared to other methods such as rock dumping or concrete reinforcement it is a highly efficient technique. |
...when we’re
under pressure

Down here only one thing counts: You give way, you lose. That's why there is an appropriate PU solution for every system. A solution that stops failures, mishaps and breakdowns, and is unbeatable under pressure.
**Bend Stiffener**

Able to take the tensile and bending forces that act on the pipeline and protect it through delimitation of the bending radii, restricting both movement and stress.

**Bend Restrictor**

A chain made from PU elastomer elements, arranged like a spinal column. It protects the pipeline against overloading (by the dead weight in the area of critical bending radii) by facilitating the crude oil from the seabed to the surface.

**Field Joint**

Stabilisation and protection of the pipeline in the area of the welding seam with an open cell rigid foam or a solid elastomer.

**Piggy Back**

A system that fixes cables and supplies lines to the riser.
What a good egg

Storing a 9,160 ton colossus with Elastocoat C unsupported on a gigantic “egg cup” is a huge challenge. But that did not stop our client, Evonik Degussa, from coming up with an innovative solution.
Evonik Degussa started with the right crane and elastomer. The team then added an enormous steel ball with a diameter of around 25 metres, a concrete foundation as big as a monster egg cup, a handful of experts and 19.5 tons of Elastocoat® C. The question was: Would the ELASTOGRAN PU system hold this enormous egg in its concrete cup?

An amazing solution that really does work

The answer was a resounding “yes” – but the challenges were considerable. The first step was installing an Elastocoat C polyurethane system as the lining of the four centimetre gap between the steel egg and the concrete foundation. The goal was the unstressed positioning of the egg with liquid gas. And as the egg was so incredibly heavy, there was simply no room for error.

That is why Evonik Degussa chose Elastocoat C as an elastomer. The product can be processed locally, is highly elastic, tension-free and UV- and weatherproof. All the qualities needed to keep the enormous egg in its cup year after year, while maintaining its natural properties and appearance.

The largest object ever to be laid on a PU bed

At the same time, ELASTOGRAN’s experts were faced with another real challenge. The PU had to be inserted quickly and precisely to ensure even distribution. That involved lifting the egg with a crane and lowering it just a few centimetres over the concrete foundation. Then the liquid PU was released from four hoses and distributed until the gap was filled. It was a process that had to be undertaken slowly from the centre outwards to the edges so that the PU was spread evenly in an upward direction.

After a setting time of five to six hours at an outside temperature of 20 °C, the system polymerised and materially integrated with the metal egg.

The end result was an absolutely firm adhesion without the need for tensile support. Following the project’s success, further spherical vessel projects are now being planned according to “the egg cup principle” in other locations.

Processor: www.ptcpur.de
Tank construction: www.neumann-eschweiler.de

<table>
<thead>
<tr>
<th>Spherical vessel – Facts</th>
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<tbody>
<tr>
<td><strong>Material:</strong></td>
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<tr>
<td><strong>Application:</strong></td>
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<tr>
<td><strong>Properties:</strong></td>
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An amazing trade fair hit

One of the world’s first 100 per cent PU-manufactured concept shoes inspired visitors at the SIMAC 2008 in Bologna. Developed by ELASTOGRAN, the “pure 1.0” caused a real stir

A winning slogan for a winning shoe. “pure 1.0” certainly lives up to its “Fully equipped – everything goes with PU” slogan. The shoe was designed in less than a year and from the ground up by international PU professionals from ELASTOGRAN. And it is conceived, designed and manufactured from PU alone – from the heel to the sole, and tip to the clasp.

With over a dozen special PU applications for each individual component, ELASTOGRAN has effectively demonstrated the technical and aesthetic flair that today’s PU offers. The company has also shown the potential that exists for the future’s designers and producers, as well as for the material and production properties of PU systems.

Doing things differently, doing things better

“Even proven experts who know all about PU and its possibilities have discovered surprising new applications for the 100 per cent PU shoe idea, and are buzzing about this"
enthuses Dr Johann Diedrich Brand and ELASTOGAN’s Martin Vallo. Both were involved in bringing the project forward in cooperation with notable suppliers from the shoe industry.

Dr Uwe Hartwig, Group Vice President BASF Polyurethanes Europe, is also very happy with ELASTOGAN’s recent success: “Our pure 1.0 is a vision of the polyurethane shoe of the future. It impressively demonstrates the enormous potential there is with design and development in PU.

The study also shows that we can put ourselves in our customers’ shoes, understand their problems and requirements and can purposefully develop intelligent solutions for them.”

A presence in every sector

Experts from across the whole of Europe have brought together a dozen individual PU parts to create this very special shoe. It is proof that with the right material, great minds can create anything.
Paradise on earth

“Call everything into question and do just the opposite.”
This is the gameplan of the Fraunhofer-Gesellschaft for their project “Hotels of the future”

Former Chancellor Helmut Schmidt is thought to have once said: “Whoever has visions, should go and see a doctor.” Well, the researchers at the Fraunhofer-Institut have saved themselves the trip by investing all of their ideas and inspiration into designing and creating the hotel experiences of the future.
Perfect from start to finish

More comfort, better service, a pleasant surprise – today’s traveller is looking for a hotel haven, not a nasty provincial overnight stay.

Reserving a room from anywhere in the world by text message is effortless and straightforward. And everything has been prepared before the guest’s arrival, as even the smallest details are already on the hotel’s records.

From the moment guests arrive, they feel cared for and appreciated. Beams of light lead them to their parking space before they enter the heavenly hotel. Lighting can be adapted to suit the guest’s mood, a whirlpool for two is waiting in the bathroom, robots deliver indulgent nightcaps and then there are the beds...

Sweet dreams

A perfect night’s sleep can only come from the perfect mattress. That’s why Fraunhofer’s planners chose mattresses made from Lupranol® BALANCE.

Lupranol BALANCE is made from renewable raw materials including castor oil. Its smooth and comfortable feel makes for a peaceful night's sleep, as does the fact that its sustainability means, it also cares for the environment. In fact, with Lupranol BALANCE it’s actually possible to preserve the earth’s fossil resources while doing nothing but sleeping, as almost a quarter of flexible polyurethane foam can be produced with renewable raw materials.

www.inhaus.de

<table>
<thead>
<tr>
<th>Mattresses foam – Facts</th>
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<tbody>
<tr>
<td>Material: Lupranol® BALANCE – PU basic product on the basis of renewable raw materials</td>
</tr>
<tr>
<td>Application: mattresses, padding for furniture and the automobile industry</td>
</tr>
<tr>
<td>Properties: good mechanical properties, low in odours and emissions, non-ageing</td>
</tr>
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</table>
O2 presents: SPS in concert

With a lot of creativity and even more SPS stages, Dublin’s most famous music hall, “The Point”, has been transformed into the city’s new highlight. The facelift has been completed in just 12 months and the hall also has a new name, “O2”
Many of the old hall’s original features have been kept, but the new construction accommodates more types of events. Theatre, concerts, shows and sports events such as boxing or even ice-skating – everything is possible thanks to the new, ultra-modern SPS stages.

An arena that brings more to its audience

The arena’s new shape allows more of the audience to sit nearer the stage. And the maximum public capacity has been increased from 8,500 to 13,000, with a total volume of 1,020 sq m.

The stage features long, projecting elements. These elements have only been viable, as stages made from SPS weigh less than a quarter of their traditional, pre-fabricated concrete constructions.

The new construction required fewer pillars and girders, allowing unrestricted views for more seats. And improved acoustics have added to the amazing improvements to the arena further still.

Flexible, fast and economical SPS

Only SPS could accommodate the concept and creation of such a leading-edge arena so cost-effectively and quickly. The erection and installation of the individual stage parts took just a few hours. As the SPS stage elements are so light, they were mainly erected by a lifting elevator rather than building cranes. A great advantage of SPS is that once elements are in place they are simple to install, as parts connect only with standard steel parts. So the arena’s seats were installed manually quickly and efficiently.

The arena’s architect, Damon Lavelle, HOK Sport, said “When we designed the arena, we already had SPS in mind. No other material would have made the solution we wanted possible. We’re very happy with the result of the SPS stages – the future belongs to this concept.”

<table>
<thead>
<tr>
<th>SPS and its advantages</th>
<th>Clever:</th>
<th>Light structures, architectural variety, beneficial CO₂ balance</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Quick:</td>
<td>SPS simplifies projects, shortens the construction period and therefore allows for earlier opening or re-opening of buildings</td>
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<td></td>
<td>Economical:</td>
<td>20 per cent savings in cost, increases yield possibilities</td>
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<td></td>
<td>Conclusion:</td>
<td>SPS stage elements save weight, construction time and costs during the building of stages and arenas. As an alternative to traditional concrete buildings, they offer improved design for the same level of functionality and only one quarter of the weight. The clear weight saving entails a weight reduction of 25 to 35 per cent in the construction of the frame. For a project of this kind, costs can be reduced by around 15 per cent.</td>
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Situated between East and West Turkey, Istanbul displays the contrasts and commonalities of two continents like no other place in the world. For ELASTOGRAN, its Turkish subsidiary represents the most southeastern cornerstone of its 13 system houses in Europe, the Middle East and Africa.

The location at Pendik near Istanbul has only been a part of the ELASTOGRAN Group since November 2000. It emerged from the Turkish company ISPOL, founded in 1985, which in 2000 was the most prominent independent PU systems producer in Turkey with a focus on small and medium-sized customers.

ELASTOGRAN took over the existing PU business and then four years later also bought the site and buildings in Pendik. Managing Director Carles Navarro says that “in
Elastogran Poliüretan (EPOL), we still perform pioneering work”. Since 2004 he has been developing the success of the system house together with a highly committed team of 44 employees.

**Out of the recession and into sixth position in Europe**

In 2001, the economic situation in Turkey was anything but stable. A banking crisis followed by the strong devaluation of the Turkish Lira made the set-up of the branch a challenging project. Under the direction of Laurent Tainturier (now President of BASF Canada), the team managed to make the most of the opportunities that came out of the crisis, and were able to firmly establish ELASTOGRAN within the heavily fluctuating Turkish PU market.

With the beginning of economic recovery in 2002, the market for PU products increased by 23 per cent. The PU growth rate is currently still above the increase of the domestic gross national product and occupies sixth position in Europe in terms of volume. Carles Navarro explains: “After the turbulent initial phase it is now a matter of adapting our production capacity for PU systems manufacturing to meet increasing demand.”
The progression and innovation continue

Take a tour of the site and it is evident how much construction is underway. A new earthquake-proof production hall has been built using Elastopir® sandwich panels, with special fire-protection design features supplied by the Turkish customer, Izopoli. Production was successfully started in October 2008 with four new mixing vessels using a completely new technology which allowed the parallel dosage of several system components. This means that the production capacity can be expanded to more than double the quantity of the former amount, putting the Turkish subsidiary in one of the leading positions of the European productivity league. Additionally, a new tank farm has been built and the entire site logistics have been redesigned. All in all, EPOL is now in a very strong position to keep building on its market leadership.

Endless opportunities with EPOL

PU rigid foam systems for the construction segment constitute 22 per cent of the entire sales. With outstanding insulation properties and an increasing awareness for environmentally friendly construction, the prospects for the insulation market are promising. Also, the market for applications of spray foam is moving at a fast pace. According to Navarro, “the construction and appliance segments are particularly attractive, whereas the footwear and automotive segments are less dynamic, though they are equally important in terms of volume in the mid-term development”.

Right now there is a particularly interesting project in development, called “PURe-Therm”, for roof and façade insulation. This recent innovation combines PU spray foam products with a top coat from BASF Construction Chemicals.
As a “package solution” for concrete façades, such as apartment and office buildings requiring an attractive frontage, this development in the Turkish market could also become the standard in other parts of the world.

In addition, the PU rigid foam system Elastocool® H is also being successfully used for refrigeration units. This is a booming segment at the moment with Turkey producing the highest number of refrigerators in Europe, mainly for export to Western Europe.

How the right materials can boost exports

The segment CASE (Coatings, Adhesives, Sealants, Elastomers) is also moving forward very quickly, particularly the PU flexible foam Elastoflex® W for mattresses and furniture. This market was, up until a few years ago, still covered exclusively by imports of foreign products. However, following ELASTOGRAIN’s development for the Turkish customer Ural Medikal, this has all changed. The new viscoelastic foam for cushions and mattresses can today be manufactured locally in only one single processing step. It has been such a success for Ural Medikal that it is now exporting its high-quality health products to 70 countries.

Hungry for success and new ideas

Such success stories depend on two different things: good products and committed employees. EPOL has both. “Here we have a young team that has developed a successful system house in a very short time,” says Navarro. “Our staff members are highly motivated and want to achieve a great deal. They are hungry for success and have enormous commitment.”

The turnover figures show this clearly, but there is no reason to slow down development, particularly while economic conditions remain unstable. Instead, marketing is being reinforced and internal training and customer service intensified. Ultimately, ELASTOGRAIN in Turkey looks set to remain ahead of the field for years to come.
Quiet...

As both the Dutch and European Union dislike noise-polluting traffic, ELASTOGREN’s developers in the Netherlands had a brilliant idea – the “loading surface whisperer”

The “loading surface whisperer” is simply a coat of Elastocoat® C laid onto a loading platform’s noisy, bumpy surface. The application means that haulage contractors, authorities that battle against noise pollution and the troubled local population are all well and truly traffic-calmed. And it proves once again that a small layer of PU can often solve problems more quickly and efficiently than rules and regulations.
Noise pollution challenges

In order to avoid peak traffic times, business deliveries generally take place early in the morning or late in the evening. In 1998 in the Netherlands for example, rules were laid down as to how much noise was allowed during the day. The maximum noise level between 7 p.m. and 11 p.m. was set at 65 decibels and 60 decibels between 11 p.m. and 7 a.m. This posed a real challenge for many thousands of suppliers bringing everyday essentials to the Netherlands’ towns and communities.

The Elastocoat C noise level solution

With a wealth of experience in the automobile and aviation industries, Elastogran B.V. in Boxtel developed the polyurethane system Elastocoat C to reduce the noise level of loading surfaces to 54 decibels by applying a coating thickness of just 5 mm.

Cutting noise levels was not the only issue – a loading area coating also needs to be durable to keep costs down and reduce the rolling friction of pallet vehicles, roll containers and sliding cardboard boxes. And Elastocoat C’s adhesion and abrasion resistance qualities proved to be highly effective in several tests.

Easy to clean and quickly to apply

Furthermore, Elastocoat C can be cleaned easily and thoroughly with cleaning chemicals under high pressure. Plus, it’s suitable for a diverse range of applications including lorry-loading areas, lifting platforms, loading ramps, levellers and horseboxes. The coating is also very quickly to apply, taking only 45 minutes for a surface of around 31 sq m. And the area coated can be used for loading in just four hours after application. The result is amazing and the Dutch people have their peace and quiet restored.

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Piek – Facts

Material: Elastocoat® C – polyurethane spray-system
Application: coating for lorry loading surfaces
Properties: noise-absorbing, hardens quickly, scratch-proof, long-life, wear-resistant, easy to process
For further information and a detailed brochure, visit www.elastogran.de or contact stefanie.vetter@elastogran.de.

Polyurethane.

Perfect insulation – efficient refrigeration.

*Absolutely required within the cold chain.

As well required: ELASTOGARAN’s PU systems Elastopor® H, Elastopir® und Elastocool® are the latest generation of insulation and insulating panels.

They save up to 16 x more energy than was used to manufacture them, reduce CO₂ emissions by more than 13 per cent and save resources by up to 12 per cent.**

Ultimately, the systems save time and money, increase efficiency and protect the environment.

**Compared to PU insulation provided by the lowest insulation panel thickness available on the market today.

For further information and a detailed brochure, visit www.elastogran.de or contact stefanie.vetter@elastogran.de.