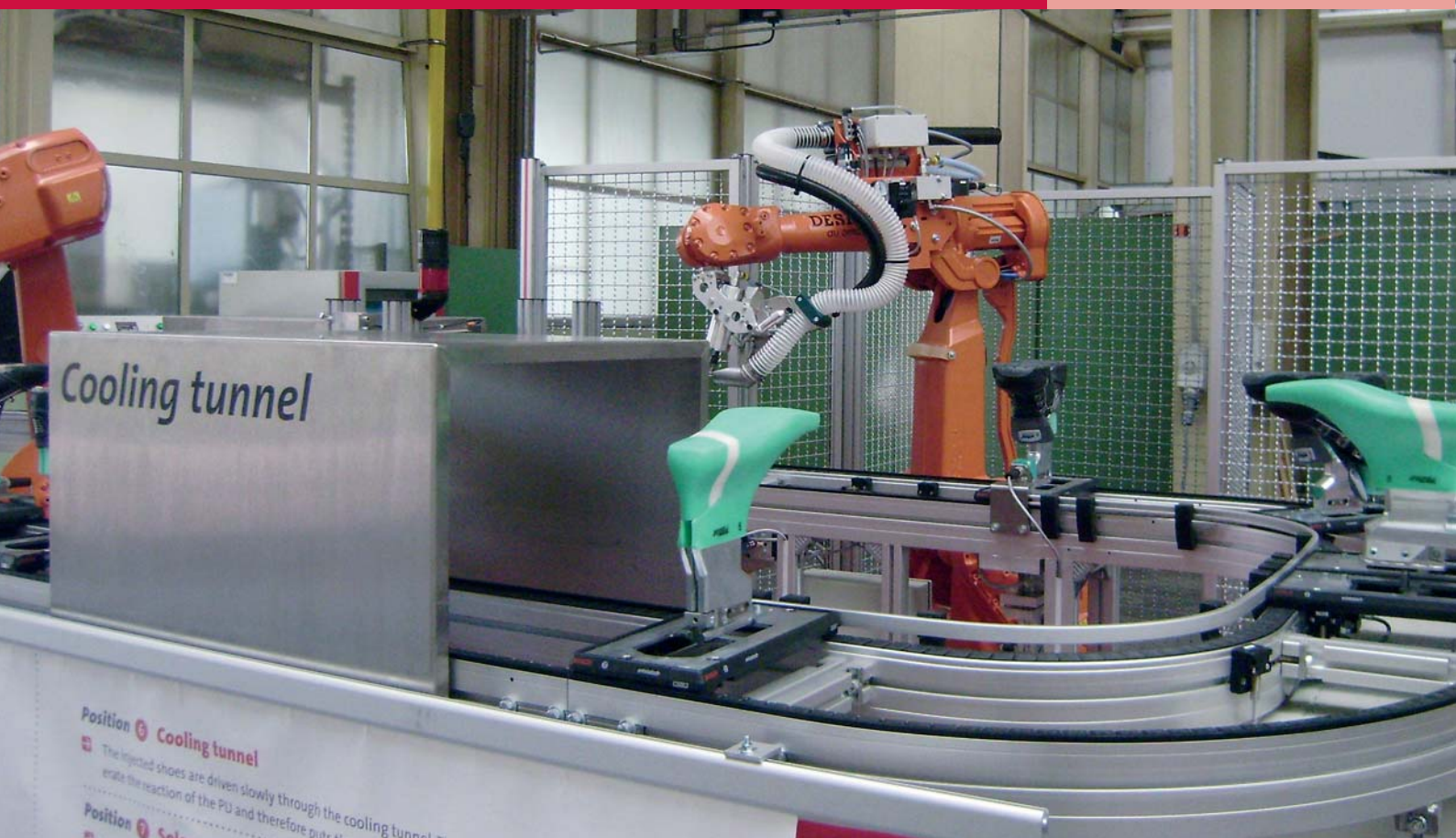




Desma's amir system enables the rationalisation of footwear production. CREDIT: WTP

DESDMA HOUSE FAIR 2008

Following a successful event in September 2006, provider of production systems to the footwear industry Desma opened its doors again this year to specialists from across the global industry for its 2008 'House Fair'.

The informal event, at the company's headquarters in Achim, near Bremen, consisted of an exhibition featuring 36 partner companies in the footwear materials space, a series of seminars, and demonstrations of its processes for direct soling, sole production, boot manufacturing and automation.

One of the highlights in the demonstration area was a display of the production system Desma has developed for inserting rubber or TPU soles directly onto lightweight polyurethane boots. The technology provider explained that the machine offers companies who manufacture this type of footwear a high level of flexibility, making it possible for them to add multi-coloured soles, for example, to their range, or to vary the hardness value of different areas of the same sole, with the heel or the ball of the foot the most likely to require greater toughness.

The demonstrations also showed direct soling of rubber and polyurethane bonded soles in one cycle on a rotary table with two bonding possibilities. The first option is to use non-

woven for the bonding between a rubber outer sole and a PU midsole, or, alternatively, adhesive may be applied to a hot rubber outer sole. Perfect bonding is ensured by the use of a primer, applied by robot.

Visitors to the House Fair were also able to look at Desma pouring units. The company said its mixing and dosing technology enables manufacturers of polyurethane soles to produce without a rinsing agent. It can also be used to produce heels, inserts and even technical parts. Pouring heads may be either manually guided or moved within the process cycle on runners, or robot-steered with an individualised steering pattern.

The amir system that enables the rationalisation of footwear production using automation was also on display. The laboratory installation had all hardware and software components of a production unit, with the amir conveyance technology, including interfaces with production planning and operating data processing, was. Desma said that, in industrial conditions, amir had been shown to increase production by up to 30% compared to conventional processes. The system, using plastic lasts, enables the production of shoes in short cycle times, with low labour costs.

BENEFITS OF RUBBER

The seminar programme began with a presentation from Dr Rik Bokhorst of Schneegans, a German materials supplier to the safety footwear market. He spoke about using rubber as the soling material for safety and military footwear.

He made it clear from the outset that the moulded parts his company produces for the footwear sector include combinations of rubber and plastic, as well as rubber on its own. An automated plant at the company's headquarters at Emmerich in Germany develops and mixes all the compounds in the most efficient way possible, he said.

The rubber in question is single density, vulcanised rubber with a hardness of between 50 and 80 on the A scale of the Shore Test, and Schneegans is able to produce it in a variety of colours apart from black.

For Dr Bokhorst, the advantage of using rubber in these specialist footwear applications is that it has good slip and heat resistance, but the disadvantages are that incorporating a sole in this material into a finished shoe is labour intensive, and the material is heavy.

"For every 100 grammes you add to the weight of a shoe," he explained, "it's the equivalent of adding a kilo to the weight members of the emergency services or the military have to carry in their backpacks."

Perhaps not surprisingly, then, rubber is coming up against greater competition than ever these days, from alternative materials such as polyurethane (PU) or thermoplastic urethane elastomers (TPUs). Nevertheless, Dr Bokhorst is convinced that when conditions become tough, particularly in hot and humid environments, rubber can still represent the best bet.

"Maybe it's not as easy to process as PU," he continued, "but you have to take care that you get adhesion. Cost is a very difficult point and a lot depends on the amount of material and the density you want. In our normal production, we're using a lot of combination of plastic and rubber; you can get very good adhesion from this, but you have to be careful over what plastic you use. We are using a lot of polyamide at the moment and it has good binding."

He said he was happy with how the material his company produces had been working with equipment such as the Desma direct soling machine. There has to be a good fit between the materials you use and the machine setting to get what he called "a good process".

Rubber, he reminded delegates, offers great versatility as a material for soles. He added: "Some customers want outsole resistance. Well, we can offer that. We can make the material conductive, improve oil resistance, and even supply



The demonstration area was among the highlights of the Desma House Fair 2008.

CREDIT: DESMA

self-extinguishing properties, which is ideal for firefighters. An example is a firefighter boot with these properties made by Elten.

NONWOVEN WONDERS

Next to speak was Volker Braeunling from Freudenberg (perhaps most famous for its household products brand Vileda), who addressed the subject of nonwoven concepts for functional solutions in the shoe industry.

The company's footwear components division is relatively new, but its approach, Mr Braeunling explained, is the same as that of all the divisions of this family-owned company: to try to introduce functional materials that will enable footwear manufacturers to offer shoes that "work better".

So far, it has concentrated on making linings, interliners or counterliners. One example is a product called Drysole, which it produces under its Vildona brand. It's a membrane-system for keeping footwear waterproof, made from fibres that Mr Braeunling's company manufactures from specific polymers, to a specific length and thickness. "It's like paper manufacturing," he observed.

The company also has a process called Spunbound, which uses chips or granules of the polymers instead. The benefit of this, he explained, is that you end up with fibres that have no ends.

He said that the basis for making any nonwoven was to form a web and bind the fibres into it. Finely bound fibres offer a fine surface on the material, producing microfibrils such as the small rectangles of cloth that we use to clean our glasses. But it's material that can also go into the lining of shoes or boots. You can dye them the colour you want or impregnate them with the necessary coating to make, for

example (using a hydrophilic polymer), a Drysole lining.

WEIGHT CHALLENGE

The discussion then returned to rubber, with Ashley Allen of Australian materials provider Abar Rubber taking the floor. His company's main product is dual-density rubber (DDR), which, he said, offers good crack resistance, less weight and the possibility for footwear manufacturers to reduce the labour intensity of their operations.

He went on to explain that DDR-soled boots have many possible applications, but feature most prominently in the usual three main market segments: military, emergency services and industrial safety. Looking further ahead, he said his company, and others in this space, faced the challenge of making lighter midsole materials, perhaps as light as 0.5 grammes per square-centimetre "to capture some of the PU market". He said there was a lot of business out there to be won.

"The surface finish is a limiting factor at the moment," he admitted. "If you use too much blowing agent, the midsole can be disfigured. But rubber is so flexible you can compound anything you want into it. We've even tried putting Kevlar to improve the tear-strength of outsoles, but availability and price were a problem."

Paulo Cesar de Almeida of ITM Brazil closed the first day of the seminar programme, talking about the role that comfort and functional fabrics have to play in the safety footwear sector.

He began by saying that it was difficult even to define comfort, as it's such a subjective thing, but that he had concluded that all you could say was that comfort was "the absence of discomfort". Footwear manufacturers have a keen need to understand this, though, because one loose thread at the ankle can undo all their hard work.

Nevertheless, some elements of this are easier to define. Most people would agree that moisture vapour needs to be driven away from the foot, for example. Mr de Almeida said his company's information suggested that, in most safety footwear brands, 50% of moisture can remain in the shoe. Using textiles with good wickability in the linings can help. Other textile innovations that can come into play include building in antimicrobial functionality.

After a vibrant social evening, with activities that included a cruise on the River Weser, the House Fair went into a second day. The seminar programme continued with presentations from Johan van Dyck of Huntsman (polyurethane solutions for customer-specific



The exhibition area, in a marquee at Desma's headquarters in Achim, hosted 36 partner companies in the footwear materials sector. CREDIT: DESMA

problems), Andreas Schmidt of Fagus (last design for safety footwear), Andrea Benvenuti and Giuseppe Vairo of Dow Footwear Solutions (a new dual density soling solution made of polyether TPU outsole and polyether midsole), Giorgio Rolla and Donato Bargigia of Repi (on the use of vegetable oil-based pigment dispersion in

PU for the footwear industry) and Mark Southam and Mike George (on testing for soling systems). We hope to bring greater detail of at least some of these papers in future issues of World Footwear. 🍷



Soling systems featured prominently in the demonstration area.

CREDIT: DESMA AND WTP