



BK Giulini site, Ludwigshafen.

CREDIT: RHENOFLEX GMBH

Something old, something new

Ask a shoe technician which was the best material to use for heel counters and they would most likely say thermo bonding non-woven. Mention bonded leather and they would probably smile and say it was old technology and not suitable for today's shoemaking. They would be mostly correct in both instances. However, while the vast majority of footwear produced today does indeed use thermo counters, manufacturers of quality ladies dress and men's Goodyear welted shoes both continue to use bonded leather as it offers everything the more traditional shoemaker looks for in a heel counter. Salamander in Germany is a major producer of high quality bonded leather board for a variety of applications including a range of products specifically for use in shoe counters.

Bonded leather is both strong and supple, so the counter will give enough support in the right places while also adapting to the shape of the foot. The foot is a delicate structure, easily

damaged by ill fitting shoes, so the heel needs firm support while some flexibility is desirable around the ankle. It is easy to mould to shape and, unlike synthetic materials which can only be edge skived, it can be skived thick or thin throughout the counter to provide toughness or flexibility wherever it is most needed. It will also take a wide knife edge skive, which prevents shadowing on light weight leathers and, combined with the flexibility this creates, allows the counter to go further forward to add more support to the foot on high heeled styles.

Its very toughness and resilience also means it will retain its shape throughout the life of the shoe. Ladies shoes must retain a clip over the heel to stay on the foot, so retaining this is extremely important. Thermoplastic materials can weaken under heat and prolonged wear so that the shoe begins lose its grip on the foot. And, lastly, because it is made from pure leather fibres and other natural products, it will absorb and transmit moisture to maintain pleasant

conditions inside the shoe. Excess moisture is a primary cause of foot discomfort and accelerated breakdown of the shoe itself.

The counters can be pre-coated with thermoplastic adhesive or with a latex type at the point of insertion during lasting. This to most modern eyes is the major drawback as inserting a fully moulded counter is labour intensive and requires a degree of skill in order to achieve accuracy and avoid wrinkled linings. The majority of footwear manufacturers cannot afford such luxury and so alternatives have been developed over the past 60 years which have now become highly sophisticated.

A REVOLUTION

Rhenoflex, a subsidiary of chemical group BK Giulini in Germany, started to produce heat-activated thermo-adhesive counters in the 1950s. Unlike its competitors, it used woven or non-woven substrates which it sold in sheet form. The big advantage was that it could be cut to shape and skived within



Salamander in Germany is a major supplier of bonded leather for heel counters. CREDIT: SALAMANDER GMBH

the shoe factory rather than being ordered as a complete component. This offered a greater degree of flexibility and economy and set the pattern for counter materials for many years to come.

The next innovation, as far as product was concerned, came in 1980 with the introduction of the patented RX3000 range. This was a major breakthrough in that the adhesive was contained within the material itself rather than being an outer coating. This meant that the skived edges would also stick to the upper and lining, thus improving the bonding area. The material was also easier to handle when hot, as it did not stick to the operator's fingers. The fact that it was made using a powder system with synthetic fillers and polyester fabric meant it was also recyclable and thus environmentally friendly.

The final refinement introduced in the late 1980s was Rhenoprint, which was totally powder-based and, although it still contained fillers taken from post-industrial waste, there was no woven element. It could also be moulded to the required shape with all edge reductions included to eliminate skiving. It also effectively eliminated all waste as everything could be re-ground and re-used as prime raw material. RX5000, introduced in 2005, took this idea a stage further by replacing the synthetic fillers with natural ones and brought the modern counter into line with the 'old' bonded fibre one in terms of environmental compatibility.

Rhenoflex's philosophy has always been to remain one step ahead and the driving force has always been to develop products that customers demand. The latest to come out of the company's R&D laboratories involves materials with comparable performance to existing ones but which are

much lighter in weight. This is in response to sports brands' quest for ever lighter weight shoes. Naturally, counters and toe puffs do not contribute much to a shoe's overall weight but, when it comes down to counting every single gram, it helps to have materials available which are up to 40% lighter.

Although the whole project is still in the development stage, tests have shown positive results. The company is naturally guarded in what it will reveal regarding how these new materials are formulated. Nevertheless, it would appear that a key factor lies in the use of expansion or blowing agents which expand during the production process to closely controlled limits. A special composition of polymers and a great deal of process know-how are required to ensure a homogenous distribution of those agents and a consistent material hardness and density.

Common properties such as resilience and shape retention are said to be excellent. As one can imagine, application is the key to performance, so all parameters have to be fine-tuned to avoid any compression and

deforming while ironing or moulding. Counter materials will be offered coated both sides as previously for ease of application and control in the factory. Rhenoflex says that the big advantage of the new material over conventional perforated ones lies in its stronger structure which means less substance is needed to achieve a given degree of hardness. When perforating a material the loss of resistance must be compensated by increasing the thickness.

So, here we have two totally different counter technologies, one old and one new, but both offering the ultimate in terms of performance in their respective spheres. Forgetting the respective technologies involved, the other big difference is that bonded leather has nowhere further to go as it is now so limited as to where it can be used. This new and as yet unnamed material from Rhenoflex, however, not only has huge potential for sports shoes but will doubtless be used in many other types of footwear in the years to come. Ladies dress and fashion shoes for starters? 

Lightweight sports footwear such as this running shoe by Nike is the initial target for the new Rhenoflex material.

CREDIT: NIKE

