



Bekina Thermolite PU working boot – wet grass can be slippery. IMAGE: BEKINA

DON'T SLIP UP

Slipping is the most common form of industrial accident. While most falls are not often serious, some are and can lead to long term health problems and possible loss of job. Most of us in the northern hemisphere tend to think of slippery conditions as being associated with icy roads and pavements in the winter months. Slippery floors, however, occur everywhere in the world and are an everyday hazard for people working in hotels, kitchens, restaurants and laundries. They can take the form of wet or greasy floors, brightly polished stairs and entrances, or other routes with slippery surfaces used by waiters, room service staff, cooks and other members of staff.

Timberland is an acknowledged market leader in the design, manufacture and marketing of rugged outdoor footwear. It therefore has years of experience in providing a sure footing for its customers on difficult surfaces. This experience has now been put to use in its footwear designed for industrial use and a good example of this is the PRO range of shoes specifically aimed at the hotel industry where

people are often on their feet all day and require superior comfort, as well as confidence in regard to slippery or shiny surfaces.

In developing this range of shoes, the company has worked side by side with BASF Polyurethanes in finding a soling material that would provide exceptionally high standards of occupational safety. The answer was found in BASF's Elastopan PU and Elastollan TPU ranges of compounds. These were found to offer outstanding abrasion resistance for extra-long life, excellent flexing properties for comfortable movement throughout the day and outstanding grip on the extremely slippery surfaces often encountered in hotel kitchens and laundries.

ELASTOPAN SYSTEMS

A decisive factor in achieving good synergy between shoes and feet is an appropriate choice of materials. Elastopan is a remarkably flexible material in this regard as it offers almost unlimited design scope in terms of shape,



Footwear from Timberland's PRO range.

IMAGE: BEKINA



colour and texture. It is also easy to handle and process as well as having excellent physical properties. It is a multi-component polyurethane foam system that is compatible with all dosing machines currently on the market and has been specifically designed for the production of high-quality midsoles and non-slip outsoles for a variety of end uses where these other features also apply.

1. Shaped moulded soles for dress and leisure shoes where it offers comfort, lightweight for ergonomic efficiency, good durability and flexibility in regard to sole design and colour.
2. Direct soling on trekking boots where its lightweight provides an advantage in terms of the wearer's performance. It is also sturdy, abrasion-resistant and shock absorbing to ease strain on joints and muscles.
3. Moulded sole units where it offers resistance to oil and petroleum products for industrial and safety footwear as well as being anti-static.
4. Moulded insoles, orthopaedic walking aids, bath mules and clogs where its lightweight makes it easy on the foot. It is also resistant to abrasion and hydrolysis, and can be combined to other materials such as leather, cork, wood, textiles or felt.

ELASTOPAN PLUS ELASTOLLAN

Elastollan is highly resistant to abrasion, oil, hydrolysis and microbes, and is easy to process by injection moulding. It is also flexible under cold conditions, so it performs well with regard to durability and grip, however wet or greasy the surface underfoot. Its general physical properties make it particularly suitable for the production of heavy duty and other industrial footwear soles. It is for these reasons that Elastopan Grip Tec and Elastollan Soft are used by Timberland for the PRO range.

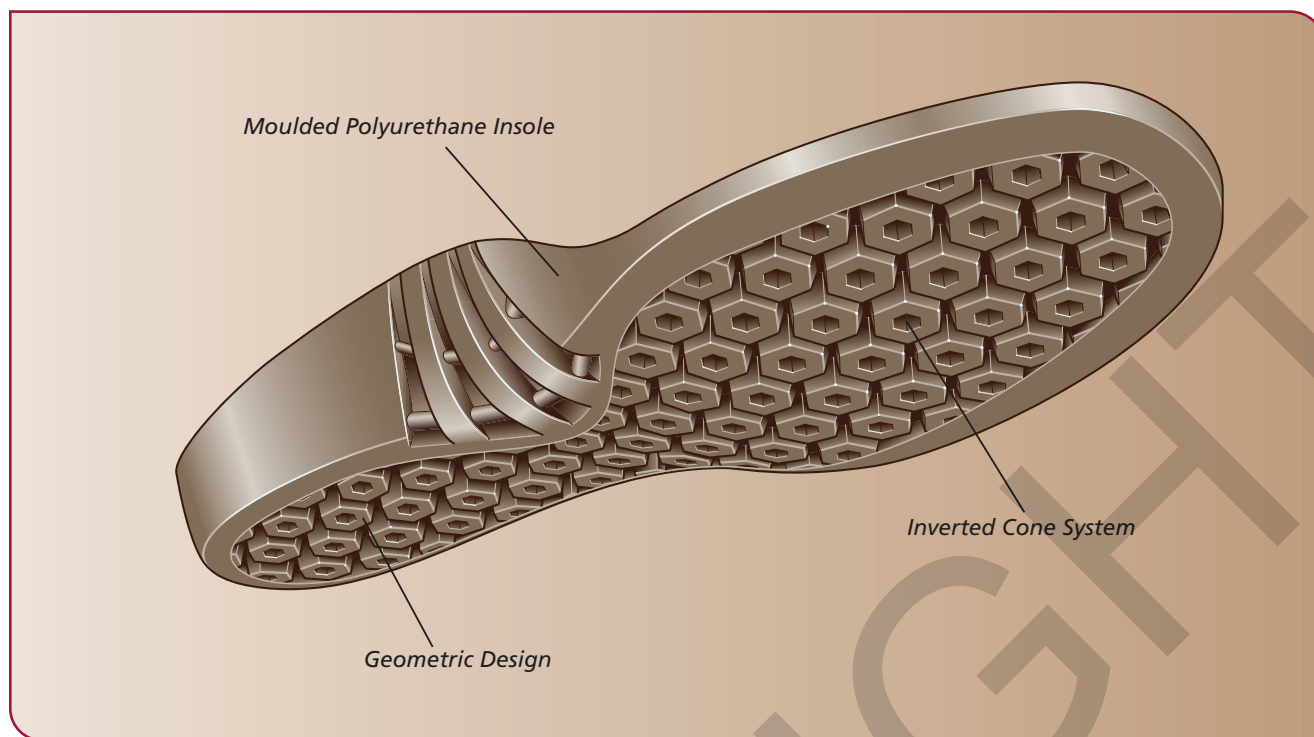
Compared to materials such as rubber, PVC or EVA,

these two compounds show clear advantages in terms of better long-term flexibility, tear strength, resistance to puncturing and hydrolysis, as well as flexibility over a broad range of temperature scales. Both bond well mechanically and chemically without any auxiliary agent or pre-treatment when direct moulded onto the shoe bottom. Processing is straightforward and uncomplicated, which also helps to reduce costs compared to alternative materials.

Elastopan Grip Tec is in fact a new compound that features a chemical composition that has been shown to offer the very best resistance to slip on icy surfaces compared to other soling materials. It also has the advantage of up to 30% less density compared to standard rubbers, so the overall weight of the shoe immediately becomes lighter with all the benefits to the wearer that implies. As far as Timberland is concerned, it must feel it has the best of both worlds, with materials for its soles that do exactly what they want them to do and a supplier able to develop and supply them to a high quality standard—clearly no slip-up in this instance.

PU WELLIE BOOTS

Now that PU has become firmly established as a soling material for work boots, it is being increasingly used in 'wellington' boots. This type of boot has traditionally been made using either vulcanised rubber for better quality products or, more recently, PVC for lower priced examples. Both are heavy to wear and have poor insulation properties, making them either very hot or very cold depending on the time of year. The machines used to produce them have low outputs due to long cycle times caused by the vulcanisation process in the case of rubber and the cooling time needed for PVC. Pioneered by Desma, they are being increasingly moulded in polyurethane which offers some significant advantages.



Shoes in the PRO range also have moulded Elastopan inserts for extra comfort during a long working day.

IMAGE: TIMBERLAND

Boots can be produced entirely from PU in a simple process by using one density for the main body of the boot and another for the sole or, alternatively, a more abrasion resistant TPU for the sole. This multi-functional ability has opened new possibilities for boot producers to widen their ranges and at the same time reduce manufacturing costs. In addition to all the well known benefits of PU, such as comfort and lightness, there is greater scope for innovative design.

ADVANTAGES

PU wellington boots have become very popular for industrial applications where the wearer has to spend up to eight hours a day in them. It is therefore a great benefit to all concerned if the standard of comfort can be raised without reducing safety standards. PU boots do this in several ways.

To begin with, they are much lighter than either PVC or rubber boots. Polyurethane also has excellent thermal properties enabling the boots to be worn in a much wider range of environments; for instance, they are particularly effective in cold conditions as they can be worn in temperatures down to -30°C .

Then there is the question of safety and, as with the shoes for hotel employees, the most important factor is once again slip resistance, in this case due to the necessity of wearing them in wet conditions. The combination of a correctly formulated PU and a good tread pattern on the outsole will give excellent results, particularly if the latter is designed so that any dirt and mud comes away quickly and easily. Finally, there is the question of colour for which, as we have already stated in this article, there is now no limit.

BASF Polyurethanes has been successfully involved in the production of wellington boots in Europe for about 10 years now, working with companies such as Bekina in

Belgium and Sievin Jalkine in Finland. The market for this type of boot has grown strongly of late in other regions as well, albeit with a decisive difference. The new generation of boots now in use across the world does not use any rubber at all, a fundamental change that is mainly due to the Elastopan PU system having demonstrated indisputable advantages over rubber as a material of choice.

RUBBER GETS THE BOOT

Elastopan is available in two different variants for this type of production: a polyester version for safety boots and a polyether one for leisure boots. By optimising the basic system in this manner, BASF has made itself the world's leading supplier of raw material in this sector of the footwear market. As remarked, because this new generation of boots can be made either entirely from PU or combined with other materials such as TPU or rubber for the outsole, the company scores all ways. By constantly developing new ways to improve quality and performance, Elastopan has created a serious challenge to rubber's supremacy.

Summer or winter, in fields, stables, on construction sites or on other wet or muddy surfaces, boots made from Elastopan have proved extremely successful. To begin with, they are up to 40% lighter than rubber boots and are also up to three times more durable. They are cool in summer but warm and soft in winter, very comfortable and extremely slip resistant. At the same time, they are also proof against oil, grease and fertiliser as one would expect a top-quality work boot to be. In fact, as regards the best material for this type of footwear, the boot is now very much on the other foot. 🇩🇪