



ELTEN

WHITEPAPER

PREVENT TWISTED ANKLES, PROTECT EMPLOYEES AND SAVE HARD CASH

HIGH QUALITY SAFETY FOOTWEAR: A HEALTHY FOUNDATION

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1. WHAT YOU WILL LEARN IN THIS WHITE PAPER

One of the most frequent causes of injury to the lower extremities are accidents resulting from slips, trips and falls (STF accidents). Objects left lying around, uneven floors and elevated workstations: in almost every sector - for instance in the construction industry, agriculture and the waste disposal industry, the steel and packaging industry, or in the field of logistics and within package delivery companies - lurk potential hazards, causing accidents that can occasionally result in serious injuries. Here, it is employees' feet that are particularly at risk. This can result in extended periods of absence, or the worst-case scenario, permanent incapacity. As a result, employers can incur enormous costs. If an employee cannot work for several weeks, this poses a risk of production losses, or orders may remain unprocessed. In turn, this poses the threat of significant financial losses, which may endanger the very existence of a small company.

Twisted ankles account for a significant proportion of STF accidents: it happens in a matter of seconds – an employee loses his footing, twists his ankle and injures himself. With serious consequences for all those involved. It is therefore clearly apparent that in professions whereby there exists an increased risk of STF accidents and twisted ankles, special protection must be afforded to employees' feet. This is the only way that a company can keep its entire workforce operational. Manufacturers of safety footwear offer solutions for this very problem – however, not all are equally suitable when it comes to providing permanent and reliable protection for employees' feet.

In this whitepaper we provide information regarding the hazards posed by STF accidents, and in particular twisted ankles, including addressing potential financial consequences. In addition, we show how these potential accidents can be effectively prevented and how money can ultimately be saved.

2. LONG-TERM CONSEQUENCES AND EXTENDED PERIODS OF ABSENCE

Every working day, around 1,000 unlucky people in Germany suffer an STF accident in the workplace. Many of these accidents are so severe that the persons concerned are incapacitated for more than three days. Almost 5,000 of those affected each year injure themselves to such an extent that they go on to receive an employers' liability association pension due to permanent health impairment as a result of their injuries. Around one in three accident pensions that are paid out due to a persistent reduction in earning capacity is the result of STF accidents. According to a secured projection by the statutory accident insurance association, Verwaltungs-Berufsgenossenschaft (VBG), the costs to employers' liability insurance associations as a result of occupational STF accidents¹ amounts to approx. 330 million euros per year. According to this projection, the cost to the German economy as a result of lost hours

resulting from STF accidents may even run into the billions. In this context, twisted ankles pose a particular risk, accounting for around half of all STF accidents. Anyone who, as part of his or her job, regularly climbs ladders, scaffolding or into the cab of construction or agricultural machinery will be exposed to this risk. This poses a threat of serious injury to the ligaments, the anklebone or the ankle joint. This affects more people than just the respective employee. For employers, periods of absence often mean more than just increased efforts with regard to shift and deployment planning; significant financial damages are often also incurred. The daily costs that an employer incurs through the loss of an employee are estimated at between 300 and 450 euros. All things considered, effectively protecting employees against falls and ankle twists is more than worthwhile.

STF ACCIDENT CAUSES

Smooth floor surfaces, steps, ladders, ramps and platforms are often triggering for STF accidents. However, various ground properties, weather conditions or uneven surfaces can pose a hazard. 45 percent of all STF accidents occur when walking on even surfaces – in these cases the floor is often too smooth or is contaminated.²

3. MOST FREQUENT CAUSES OF ACCIDENTS: STF

Accidents caused by trips, slips and falls (STF accidents) are not only prevalent in a sport and leisure context – they also top the list of occupational accidents by some margin. According to the German Statutory Accident Insurance Association (Deutsche Gesetzliche Unfallversicherung, DGUV), the number of reportable STF accidents in 2018 was 172,000³. This corresponds to around 21 percent of all reportable occupational accidents that year. In turn, with 43.6 percent in 2018, ankle twists accounted for almost half of all STF accidents – and at 9.5 percent also

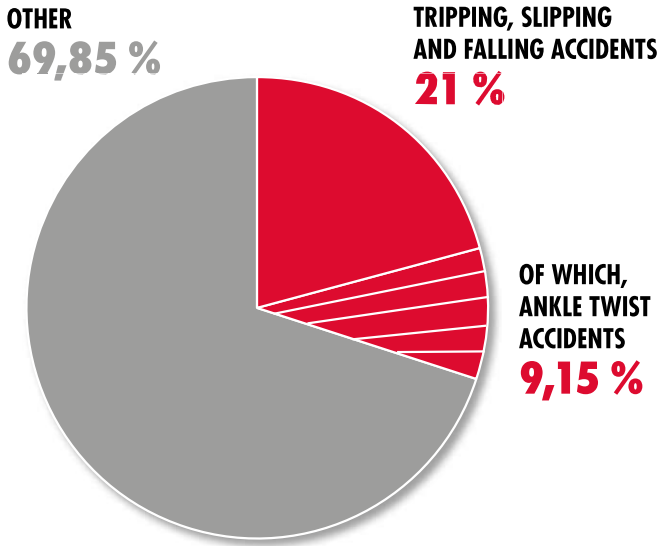
accounted for a significant proportion of all reportable occupational accidents⁴. Many of these accidents have such serious consequences that they result in the complete or partial incapacity of the person concerned, thus incurring enormous costs. According to the VBG, STF accidents cost the German economy around 8 billion euros every year⁵.

A mere glance at these figures makes it clear how important preventative measures with regard to STF and ankle twist accidents are.

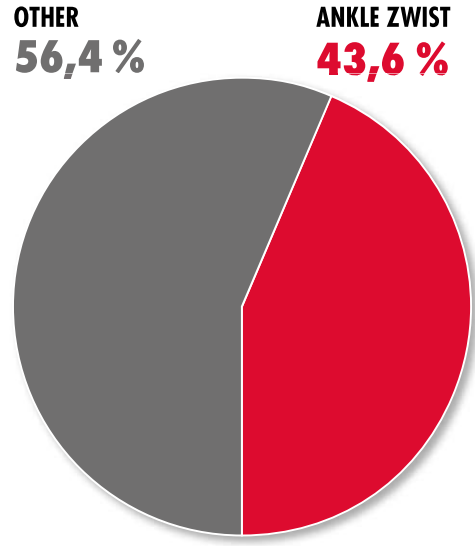
^{1/2/5} https://www.vbg.de/apl/arbhilf/unterw/171_srs_1.htm

^{2/3} Statistics Department, Deutsche Gesetzliche Unfallversicherung (DGUV)

TOTAL NUMBER OF REPORTABLE ACCIDENTS AT WORK



TRIPPING, - SLIPPING & FALLING ACCIDENTS



OCCUPATIONAL ACCIDENTS

When must an occupational accident be reported? According to §193 Para. 1 SGB VII, employers must report every accident within their companies whereby insured persons are killed or injured to such an extent that they are unfit for work for four or more days. Accident events are any occupational accidents, in the literal sense (§8 Para. 1 SGB VII), and all commuting accidents (§8 Para. 2 SGB VII), that is, accidents that occur on the way to or from the location of an insured activity. Pursuant to insurance law, commuting accidents are deemed equivalent to occupational accidents.

AN INCREASING NUMBER OF ANKLE TWIST ACCIDENTS

Accidents involving twisted ankles occur particularly frequently in the construction, logistics, waste disposal and agricultural sectors, as well as the steel and packaging industry, but also within package delivery companies. Added to this is the fact that an increasing number of employees are being deployed in particularly at-risk work areas– with the number of accidents and at the same time the need for appropriate solutions increasing accordingly. An ankle twist is something that happens quickly: an employee unexpectedly misses a rung when climbing

a ladder, or loses his footing on the ground when jumping down from the driver’s cab. Often it takes but a fraction of a second to twist an ankle. However, walking on an uneven surface can also result in a twisted ankle. This can ultimately result in ankle strains or breaks, or complicated ligament and ankle joint injuries. What’s more, a twisted ankle can also be the primary cause of subsequent serious injuries, such as stumbling into machines or falling from a height.

ANKLES ARE COMMONLY AFFECTED

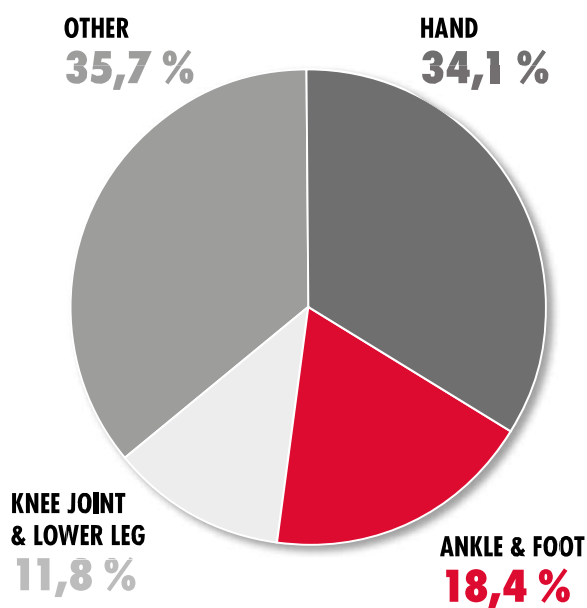
According to the statistics compiled by the DGUV, in 2018 ankle and foot injuries represented the second most commonly injured body part, accounting for 18.4 of all reportable occupational accidents. Of these, injuries to the upper ankle joint accounted for 57 percent, making it the area most commonly affected by twisted ankles. Considered on its own, this corresponds to a 10.5 percent share of all reportable occupational accidents. In this context, only the hand was more frequently affected than the foot and ankle area (34.1 percent, 268,000 cases).⁶

When considering newly granted accident pensions, foot and ankle injuries even top the statistics with 16.3

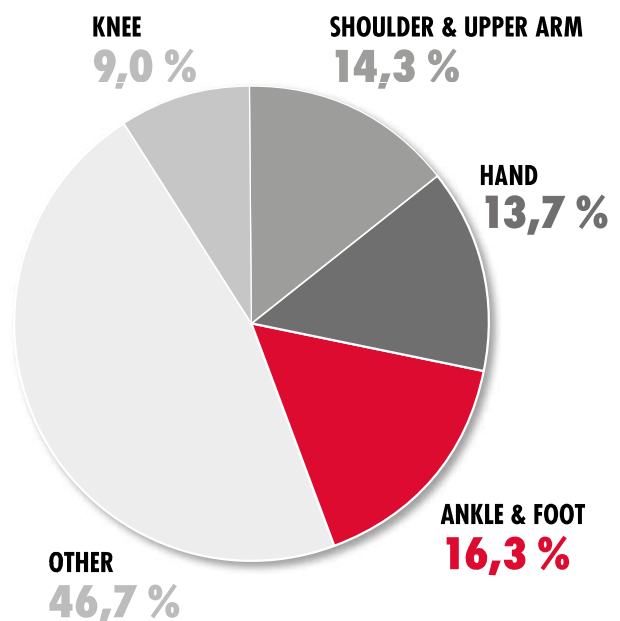
percent (1,900 cases). Here too, injuries to the upper ankle joint account for almost half, at 47 percent, and as such were the main cause of new accident pensions.⁷

At this point, the agricultural and forestry injury, along with landscaping, should be mentioned, as one of the sectors in which twisted ankles occur particularly frequently. According to the German Social Insurance Association for Agriculture, Forestry and Landscaping (Sozialversicherung für Landwirtschaft, Forsten und Gartenbau, SVLFG), in 2018 twisted ankles accounted for 7.4 percent of all occupational accidents. This resulted in the granting of 41 new accident pensions.⁸

DISTRIBUTION REPORTABLE OCCUPATIONAL ACCIDENTS



DISTRIBUTION – OCCUPATIONAL INJURY PENSIONS



THE HUMAN FACTOR

A significant factor in the occurrence of accidents is human error. Distraction, stress, time pressure, rushed movements or fatigue on long working days result in inattentiveness, and ultimately, accidents.

^{6/7} Referat Statistik, Deutsche Gesetzliche Unfallversicherung (DGUV)

⁸ Sozialversicherung für Landwirtschaft, Forsten und Gartenbau (SVLFG)

4. A SIMPLE SOLUTION FOR A FAR-REACHING PROBLEM

With regard to the avoidance of accidents as a result of twisted ankles in the workplace, along with the resulting injury to employees, the focus is often placed on the fundamental design of the respective workstations: non-slip treads, labelling of hazardous areas or the correct

lighting are important starting points in this regard. However, also of vital importance is the equipping of each individual employee with appropriate personal protective equipment (PPE).

FOOT PROTECTION OPENS UP POSSIBILITIES

Alongside classic safety features such as toecap protection and penetration-resistant midsoles, modern foot protection also offers features such as non-slip outsoles that provide more grip on slippery or smooth floor surfaces. However, to minimise the risk potential, especially with regard to twisted ankles, requires additional equipment. In the standards to be complied with concerning safety footwear, there are no requirements regarding ankle-twist protection, however, manufacturers have recognised the necessity and have developed preventative solutions. A taller and more rigid shaft is often deployed to provide the ankle area with the necessary stability. However, this can quickly constrict the foot, and under certain circumstances can cause painful pressure points, or in extreme cases restrict the circulation. This is because the rigid construction does not perfectly follow the natural direction of

movement of the lower leg and thus restricts the freedom of movement. This can cause the muscles to become sluggish, thus failing to sufficiently fulfil their natural stabilising function. As a result, as soon as rigid joint protection such as this is removed, the risk of injury can ultimately become even higher. Added to this is the fact that, in traditional safety boots with a high shaft, a crease can typically form in the ankle area when walking – this type of material fatigue can also result in the loss of some of the required stability.

A logical alternative, which has proven effective in such situations, is the use of special cuffs that stabilise the ankle joint and simultaneously adapt to the natural movements of the foot and knee joints. With BIOMEX Protection® technology, safety footwear manufacturer ELTEN offers precisely this type of joint protection solution.

PROTECTIVE PROPERTIES OF SAFETY SHOES

Alongside joint protection, there are other properties that are also crucial in avoiding STF accidents. It is important to consider optimal fit (length and width) just as the special requirements of the workstation must be taken into account. Smooth and slippery floor surfaces, for example, require a non-slip sole – a rough tread profile is recommended when walking on deep and uneven soils.

BIOMEX PROTECTION®

The flexible shaft cuff made from durable plastic is securely “anchored” in the midsole area of the shoe. When tensile and pressure forces then act simultaneously – as is frequently the case in the event of ankle twists – it gives the foot stability. Because the cuff is positioned in front of the lateral ligamentous complex, it protects against twists and impact. It wraps around the outside of the heel area and the ankle joint, which means the foot is not constricted and there are no pressure points or impairments to the circulation. What’s more, thanks to the mobile construction of the cuff, BIOMEX Protection® follows the natural, asymmetrical direction of movement of the lower leg. For, contrary to what one might expect, when the knee bends – when walking for example - the lower leg does not move straight, but rather in an inward direction, towards the centre of the body: the functional axis of the

foot is generally turned 30 degrees towards the inside. The BIOMEX axis corresponds to this natural axis of movement, and thanks to two angled centres of rotation in conjunction with the muscles, tendons and joints of the foot, the shaft follows the natural movement of the lower leg, unhindered. The lightweight BIOMEX cuff thus mirrors the movement of the wearer in such a way that he need not work against it. As a result, freedom of movement is retained, the naturally asymmetrical pattern of movement is not restricted and the roll behaviour of the foot is even improved. And there’s more: the system’s special biodynamic construction supports the body’s natural muscular reaction and protection mechanisms and gives the wearer more time to counteract the twist. As such, BIOMEX Protection® prevents ankle twisting and reduces the severity of the injury if an accident were to occur.

DEVELOPMENT OF BIOMEX TECHNOLOGY

The technology that enabled the development of BIOMEX Protection® stemmed originally from the sports sector (skiing, inline skating or hiking). ELTEN adopted the technology for use in safety footwear.

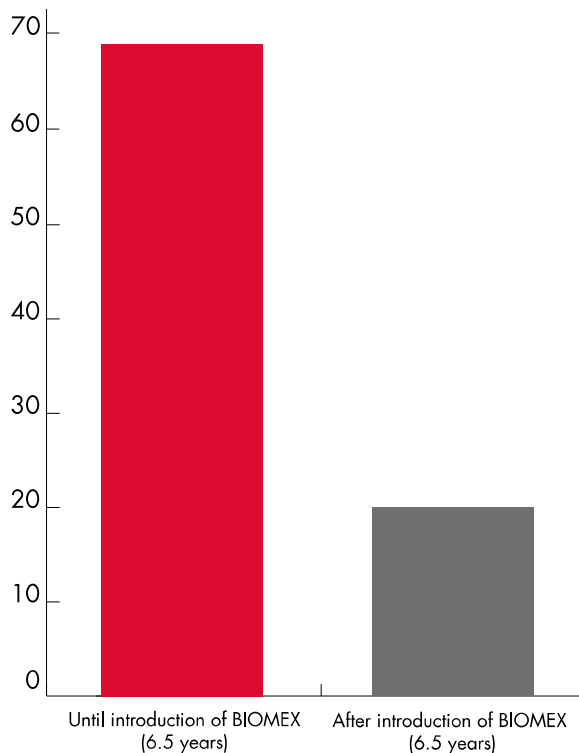
MEASURABLE SUCCESS

Numerous companies now use BIOMEX Protection® to protect their employees – and in so doing, they save hard cash. According to a study conducted by *Smurfit Kappa*, a globally active company within the packaging industry, the number of ankle twist accidents within the business fell significantly with the use of BIOMEX Protection® and the accompanying training of all employees regarding the correct use of the system: between 2012 – when the

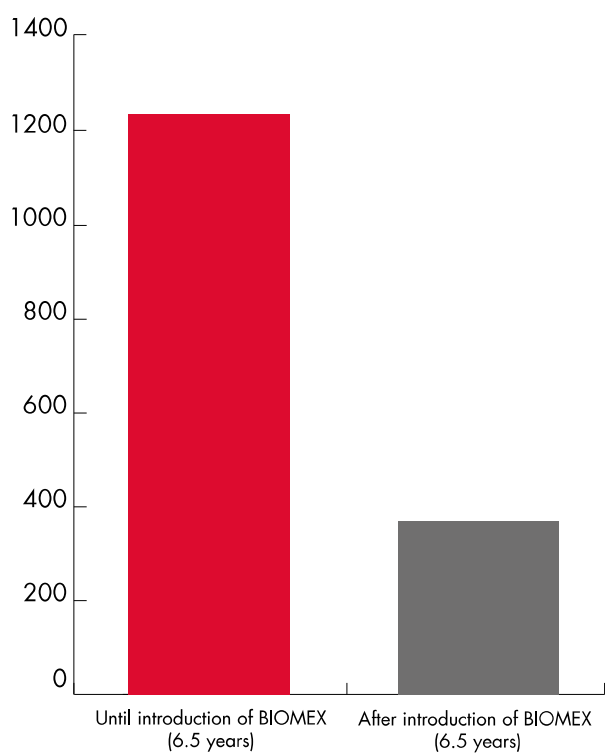
system was first introduced – and 2018, the number of ankle twists within the company fell from 69 to 20, which equates to a 71 percent reduction.⁹ This positive development is also reflected in the number of lost days caused by ankle twist injuries. At Smurfit Kappa the number of such injuries fell by 72 percent following the introduction of BIOMEX Protection® – from more than 1,200 lost days to fewer than 350.

⁹ Smurfit Kappa Group plc

ACCIDENTS BEFORE AND AFTER THE INTRODUCTION OF BIOMEX



DAYS LOST DUE TO TWISTING ACCIDENTS



5. PREVENT ANKLE TWISTS AND SAVE YOURSELF A GREAT DEAL OF BOTHER

Accidents caused as a result of slips, trips or falls are right up there on the list of occupational accidents. In this regard, ankle twists pose a particular hazard. Illness-related leave due to serious injuries caused by ankle-twisting costs German companies and insurance providers several billion euros each year. This represents an enormous financial loss, which is to some extent avoidable. Providing employees with appropriate foot protection can have a major positive influence in reducing the quantity and the intensity of ankle twist injuries in the workplace. A central point must be noted in this regard: appropriate joint protection should offer sufficient stability and prevent injuries – however, at the same time it must be sufficiently flexible in order to support the work of the muscles, without impairing the body’s natural muscular protection mechanism. It must not constrict the foot. In light of this, with the BIOMEX Protection® system, safety footwear manufacturer ELTEN offers a solution that takes precisely these factors into con-

sideration and that can be used in all potentially at-risk professions. The flexible plastic cuff protects the areas of the lower extremities (ligaments, muscles, tendons and joints), by wrapping around the heel area and the foot joint and following the natural movement of the foot. In this way, it prevents the twisting of the ankle – or at least significantly reduces the severity of an injury in the event of an ankle twist accident. Long periods of sick leave or, in the worst case, permanent incapacity can thus be prevented, and the company will save hard cash. Tests show that, through the use of the BIOMEX cuff, companies can reduce the number of ankle twist accidents by more than 70 percent. It is therefore clear: if a company invests in suitable foot protection for its employees, it makes a valuable contribution to preserving the health of its employees and, in an era marked by a shortage of skilled labour, to the sustainable preservation of the workforce.

* All of the figures stated in this whitepaper correspond to the information stated in the cited sources. The figures have been rounded up or down to improve readability.