

Refined Bitumen Association

Safety Footwear Risk Assessment for Bitumen Delivery Drivers

The information in this risk assessment is given in good faith and belief in its accuracy at the time of publication, but does not imply any legal liability or responsibility by the Refined Bitumen Association.

The Health and Safety at Work Act 1974 and The Management of Health and Safety Regulations 1999 require employers to provide safe systems of work to ensure the safety of their employees and the public. Health and Safety Law imposes duties on both the supplier and the customer to provide safe systems of work. This risk assessment is intended to help both parties comply with their respective responsibilities during the delivery of bitumen products and is not intended to vary the legal responsibility of either party.

1. Introduction

Current UK safety legislation requires employers to carry out risk assessments to identify the dangers to which employees are exposed in the course of their work and then to define the physical and procedural measures by which the risks can be eliminated or at least minimised. Through this process the 'residual risk' can be addressed by the use of personal protective equipment as the last line of defence.

This risk assessment addresses the role of safety footwear in minimising the risk of hot bitumen burns and other injuries to the lower legs and feet during the bulk bitumen delivery process.

2. Potential Injuries to Lower Legs and Feet

Burns

The most serious risk posed by the handling of hot bitumen products is burns, as bulk bitumen is handled as a hot liquid at temperatures up to 230°C. Burns are most likely to occur if there is an uncontrolled release of hot bitumen. The equipment employed and associated safe operating procedures, as defined in the UK Edition of the Guide to Safe Delivery of Bitumen, are designed to minimise this possibility. The guide is reviewed on a regular basis and updated / improved when appropriate to further minimise the risk (Ref RBA website: <http://www.bitumenuk.com>).

Sprains and Fractures

A sprain is a stretch injury to the ligament that supports the ankle and is normally caused when the foot is turned inwards on an awkward step or on uneven ground. Fractures are normally caused by a sudden forceful twist or hard blow to the ankle or foot.

The first line of defence against such injuries is the requirement, as defined in the UK Edition of the Guide to Safe Delivery of Bitumen, for a safe and readily accessible delivery point to be provided. This includes the provision of a flat even surface at the delivery point and adequate lighting. Manual handling training, which includes safe lifting techniques, is provided for drivers to minimise the risk of delivery hoses and other miscellaneous equipment being mishandled and dropped.

3. Footwear Requirements

The UK Edition of the Guide to Safe Delivery of Bitumen, indicates the recommended Personal Protective Equipment for bitumen delivery drivers, see Appendix One. All safety boots must be manufactured to BS EN 345, include toe cap protection and anti-slip soles. In addition the key requirements of footwear for delivery drivers are:

- Resistant to hot bitumen spillages.
- Provide support to the foot and ankle.
- Correctly fitting, comfortable and practical for the application.

4. Safety Footwear Assessment

Safety Shoes

Normal safety shoes incorporate a steel toe cap for protection against items being dropped on the foot but they provide no ankle support and only partial protection against burns. The low and open side of the shoe, the tongue area and lace eyelets provide ingress points for hot bitumen.

Safety Boots (Lace-up)

Although lace-up safety boots provide ankle support there is a concern about their ability to protect against bitumen burns. The relatively low top, the tongue area and the lace eyelets provide possible ingress points for hot bitumen. Furthermore in the event that bitumen is spilled/sprayed onto lace-up boots the delivery driver or first aider might struggle to release the boot quickly from the foot, potentially prolonging the period of skin contact with hot bitumen or exposure to heat burns.

Over-boots (Designed to be used with lace-up shoes/boots)

Several over-boots have been tested by various bitumen suppliers to assess whether the benefits of a lace-up boot and the protection of rigger boot could be achieved. Delivery drivers have provided generally negative feedback due to the over-boots' cumbersome nature and difficulty in putting them on and taking them off. An improved version of the over-boot may be an option for the future.

Rigger Style Boots

The main benefit of the rigger style boot with ankle support is that it can provide the maximum protection against lower leg and foot burns from hot bitumen when worn in accordance with Appendix One of the UK Edition of the Guide to Safe Delivery of Bitumen, (boiler suit/coverall **over** top of boot). The lack of openings for the ingress of hot bitumen is an advantage because it prevents skin contact and the boots can be removed quickly and easily in an emergency, reducing exposure to heat. They provide less ankle support than lace-up safety boots but this is usually a secondary consideration for a delivery driver. Normally, the delivery driver changes into the rigger style boots only for the actual delivery, so the ease of putting them on and taking them off encourages their use.

Foundry Boots

High and medium leg Foundry Boots are capable of offering similar protection to rigger style boots though there is a greater potential for ankle and lower leg movement if the boots are not fastened tightly. However, if they are fastened securely and bitumen is spilled / sprayed onto the boots, the delivery driver or first aider may struggle to release the boot quickly from the foot, potentially prolonging the period of exposure to heat. The low leg Foundry Boot offers insufficient overlap of the boot top and overall. Therefore the Foundry Boot offers less practical protection than the Rigger Style Boot and is not recommended for bitumen loading or discharge.

Lumberjack Boots

Arguably the only other boot capable of offering similar protection to rigger style boots is a high-leg, lace-up lumberjack style boot. This will give better protection than a rigger style boot or an ankle-high lace-up, but is unsuitable for driving. Putting on the boots takes several minutes and is best done sitting down. The delivery driver may need to change his footwear six times per shift and a lengthy, uncomfortable procedure makes this undesirable. Therefore the lumberjack boot is not considered to be a practical option.

5. Summary

Although no safety footwear can provide complete protection against all injuries, this risk assessment has considered all of the injury risks and their potential seriousness.

Assuming the customer provides a safe environment at the delivery point, as defined in the UK Edition of the Guide to Safe Delivery of Bitumen, the prime aim of the additional protection afforded by Personal Protective Equipment for bitumen delivery drivers should be to minimise the potential for hot bitumen burns and facilitate the quick and easy removal of the boot in an emergency situation.

Considering all factors in bulk bitumen delivery operations, the protection of the lower legs and feet from hot bitumen burns is best afforded by the Rigger Style Boot, with the coverall garment legs overlapping the boot.

RBA January 2012

APPENDIX ONE

Refined Bitumen Association – Personal Protective Equipment Guidelines (Guide to Safe Delivery of Bitumen, UK Edition June 2011)

Minimum level of PPE for all personnel around the delivery.
Higher level of PPE may be required locally.

- Head protection:
 - Helmet (preferably fitted with chin strap)
 - Neck apron
 - Full visor to protect the face
 - Site specific additional equipment: safety spectacles/goggles, ear defenders
 - i) Safety helmet approved to BS EN 397
 - ii) Neck apron approved to BS EN 470-1 & BS EN 531 A B1 C1
 - iii) Full face visor approved to BS EN 166-1F
 - iv) Eye protection approved to BS EN 166-1F
 - v) Ear defenders approved to BS EN 352-2

- Gauntlet gloves with long sleeves.
 - Gloves approved to BS EN 420 and BS EN 388 and must be 14 inches (355 mm) long

- Safety boots: Rigger style boot*.
 - Boots approved to BS EN 345 S3 HRO

- Coverall: 100% Cotton Fire Retardant Coverall complying with EN ISO 11612 Protective clothing for workers exposed to heat (preferably Proban® or similar treated). Note: Some sites may also require anti-static treatment.
EN 1149 Protective clothing: Electrostatic properties.
 - Coverall approved to BS EN 471 Class 3 and EN 531 A B1 C1.
 - Coverall legs to be worn over boots

- As a standard the vehicle must also carry the following equipment:
 - First aid kit
 - Eyewash bottle
 - Fire extinguishers

*Rigger style boots, with the coverall legs overlapping the boots, are deemed to provide the best protection of the lower legs and feet from hot bitumen burns.

