

# Health & Safety

## Safe Handling of Bitumen & Bitumen Products



### Hazards

#### Burns

Paving grade bitumens, including polymer modified binders (PMB) are supplied and stored at very high temperatures in the range 150°C to 190°C, making them much hotter than boiling water. Bitumen burns may cause severe damage to eyes and skin. Sadly, accidents have resulted in workers requiring skin grafts. Burns victims may also suffer from shock. Keep them warm and rested. Do not give them food or fluids.

#### Fumes

Hot bitumen products may give off irritating fumes resulting in eye, nose and throat soreness. Bitumens may also contain hydrogen sulphide (H<sub>2</sub>S) gas, also known as "rotten egg gas". H<sub>2</sub>S may accumulate in confined spaces and reach hazardous levels. Exposure to H<sub>2</sub>S may cause eye, nose and throat irritation, nausea, headaches and, in extreme cases, may be fatal.

#### Boil-Overs

Violent boil-over of tanks can occur if water or bitumen emulsion is present when loading hot bitumen products.

#### Pyrophoric Deposits

Deposits of complex chemicals may develop in bitumen storage tanks and these may self-ignite when exposed to air.

### Safety Precautions

**Full skin protection** is required to avoid accidental burns when transferring or handling hot bitumen. Always wear long-sleeved shirts or overalls that are buttoned up at the wrist, long trousers (legs worn over boots, not tucked in), gauntlet heat-resistant gloves, safety shoes, face shield with clear visor, and balaclava or flaps to cover the head.

**Check the contents of the previous load** before loading bitumen into tankers and follow procedures to avoid a boil-over.

**Do not use steam to empty pipelines or hoses** as this will allow water to enter the system and may cause a boil-over.

**Avoid exposure to fumes** which may be released on the initial opening of the hatch on a road or rail tanker or storage tank – a vapour plume of hot bitumen

fumes and H<sub>2</sub>S may be released. Avoid exposure to these fumes by standing back on the gantry or upwind until the vapours have dispersed.

**Minimise bitumen fume** by heating bitumen and asphalt products to the recommended temperatures – do not overheat them.

**Minimise the use of diesel** when cleaning equipment as this contributes to the bitumen fume.

### Bitumen First Aid

#### Burns

*It is important that everyone working with hot bitumen be familiar with the recommended first aid treatment of bitumen burns. Notes for guidance of first aid and medical personnel are provided in the form of a Bitumen Burns Card available from the Australian Asphalt Pavement Association.*

**Cool the affected area** with cold running water for as long as possible, preferably until medical assistance is obtained – this is very important. Ensure that bitumen splashed in difficult areas, such as the back of legs, is also cooled with water. Body hypothermia must be avoided.

**Do not attempt to remove bitumen** adhering to the skin as it forms a sterile protective layer.

**Take immediately to hospital or medical centre** with the approved **Bitumen Burns Card** and advise medical staff of the nature of the burn.

#### Fumes

**Move person to fresh air** and seek medical assistance if respiratory irritation persists.

### Bitumen Fire

**Call the emergency services immediately** – dial 000 or call the Fire Brigade.

**Attempt to extinguish the fire** using foam, dry chemical powder, inert gas extinguishers or water sprays – **never use water jets** to fight the fire.

**Switch off heaters and pumps and close valves** if safe to do so.

### Bitumen Spills

**Call the emergency services immediately** – dial 000 or call the Fire Brigade.

**Isolate the source by switching off pumps and closing valves** if safe to do so.

**Eliminate nearby ignition sources.**

**Contain the product** by using dirt or sandbags.

**Make sure all drains are blocked** to stop access to waterways.

**Allow the spilt bitumen to cool** before scraping it up.

**Appropriately dispose of spilt bitumen** to an approved landfill site.

*In the event of spillage of cutback bitumen or bitumen emulsion, or when heavy rainfall occurs after spraying: It is important to ensure that entry to waterways is prevented – dam the product if necessary to stop it entering the waterway. Place a boom or barrier to stop any contamination travelling downstream. Remove bitumen residues that remain in the vegetation on the sides of the waterway.*

**Contact local authorities and/or emergency services.**

**Check for any affected wildlife** coated or otherwise affected by the spilt bitumen products and contact the EPA for assistance if necessary.

### Safe handling of SBS-modified Polymer Modified Binders

*Polymer modified binders incorporating SBS polymer require close attention to their handling and application to avoid degradation of the binder and exposure to irritant fumes.*

**Avoid fumes by:**

- ✦ Storing and handling products at the recommended temperatures.
- ✦ Not overheating products.
- ✦ Minimising the use of diesel for cleaning tools and equipment.

**Excessive fumes may:**

- ✦ Irritate the eyes, nose and throat.
- ✦ Cause nausea, headaches and a general feeling of being unwell.

**If a worker suffers from any of the above symptoms:**

- ✦ Report it to a supervisor immediately.
- ✦ Seek medical advice.
- ✦ Complete any necessary incident reports.

**Important points to remember:**

- ✦ Know the product being handled.
- ✦ Know the recommended storage and handling temperatures.
- ✦ SBS-based PMBs have their own unique odour – however they are safe to use when stored and handled according to recommendations.
- ✦ If there is any concern or query regarding the health and safety aspects of SBS-based PMBs, please seek advice and guidance.

#### Recommended Handling and Application Temperatures for Puma Bitumen SBS-based PMBs:

	Storage	Pumping	Mixing/Sealing	Compaction
Asphalt Grades	185°C maximum	160°C minimum	155°C - 175°C	140°C - 160°C
Sealing Grades	185°C maximum	150°C - 170°C	175°C - 190°C	

### Material Safety Data Sheets

Further detailed information on the health and safety aspects of Puma Bitumen products is available in the product **Material Safety Data Sheets** available on our website: [pumabitumen.com.au](http://pumabitumen.com.au)

### Recommended references:

#### Austrroads

- ✦ AP-G41/15 Austrroads Bituminous Materials Safety Guide

#### Australian Asphalt Pavement Association

- ✦ HSE Guide Intro: Introduction to health and safety in the flexible pavement industry,
- ✦ HSE Guide 1: Guide to good practice in asphalt and bitumen laboratories
- ✦ HSE Guide 6: Safe Working In Heat
- ✦ HSE Guide 7: Updated guide to the safe use of bitumen transfer hoses
- ✦ HSE Guide 8: Guide For Environmental Management When Spraying Bituminous Materials
- ✦ Advisory Note 7: Guide to the Selection, Heating and Storage of Binders for Sprayed Sealing and Asphalt Manufacture
- ✦ Advisory Note 10: Loading Hot Bitumen Products
- ✦ Advisory Note 14: Summary of SBS Bitumen Fume Monitoring Project