
B3 – Asphalts for Thin Surface Course

The BS EN Standards for bituminous mixtures recognise two different types of asphalt for use in thin surface course:

- Asphalt concrete for very thin layers
- Stone mastic asphalt (SMA).

Full details are given in:

Standard: BS EN 13108-2 and BS EN 13108-5, Bituminous mixtures – material specifications.
Part 2: Asphalt concrete for very thin layers
Part 5: Stone mastic asphalt

BS Guidance: PD6691

In the UK, these materials have traditionally been supplied as a proprietary thin surface course system.

Proprietary thin surface course systems are covered by a certification system managed by the British Board of Agrément (BBA). Details can be found on: www.bbacerts.co.uk

Asphalt concrete for very thin layers

These specialist types of asphalt concrete are designed for use in surface course layers with a compacted thickness between 20mm and 30mm. The grading of the mixture is designed to give stone to stone contact and an open surface texture.

Asphalt concrete for very thin layers is not routinely available for general use.

Stone mastic asphalt (SMA)

BS EN 13108-5 provides a way of specifying SMA type mixtures that was not available in previous British (BS) Standards.

SMA-type mixtures have a high proportion of coarse aggregate (like a coated macadam mixture). However, the coarse aggregate has a dominant size fraction, in the same way as there is a dominant coarse aggregate fraction in a rolled asphalt mixture.

The gaps between the coarse aggregate particles are filled with a 'mastic' (mortar) of fine aggregate, filler and bitumen.

A well designed SMA-type mixture will have just enough 'mastic' to fill nearly all the voids between the coarse aggregate particles, but leave a 'negative texture' on the compacted surface of the finished layer.

Whilst large volumes of SMA-type mixtures are supplied as part of proprietary thin surface course systems, significant amount are also sold for general use.

SMA-type mixtures have more aggregate interlock than the equivalent asphalt concrete mixture, to resist turning traffic. They also have a thicker coating of bitumen on the surface of each aggregate particle, to give enhanced durability.

SMA-type mixtures for general use are usually made with grade 40/60 paving bitumen, with cellulose fibres added to limit drainage of the binder from the coarse aggregate particles.

Proprietary mixtures often use polymer modified bitumen.

Mixture designation for SMA-type mixtures

The BS EN Standards use a system of mixture designation based on four sections. For SMA-type mixtures, the four sections are:

- SMA
- D
- bin/surf
- binder.

This can be explained as:

- HRA — Rolled asphalt
- D — Upper aggregate size of the mixture. mm
- bin — binder course
- surf — surface course
- binder — grade of bitumen.

The BS EN Standard and the UK guidance species four values for D:

- 6mm
- 10mm
- 14mm
- 20mm.

The UK guidance also gives target values for grading and bitumen content.

20mm size SMA is not routinely used.

10mm and 14mm size SMA can be produced as a binder course for use in specialist resurfacing work.

SMA binder course usually has a lower surface texture than the equivalent surface course. It can also be made with aggregates that are not suitable for trafficked surface course layers, such as limestone.

For surface course, categories for resistance to polishing (PSV) and resistance to abrasion (AAV) must also be specified.