

B7 – Quality Management & Control

In traditional British (BS) Standards, the evaluation of compliance levels was covered by the contractual arrangements between the producer of the mixture and the customer. BS EN Standards are different. They contain requirements for ‘evaluation of conformity’.

Evaluation of conformity covers the detailed procedures that a producer must follow to demonstrate that the mixture complies with the requirements of the Construction Products Directive.

The procedures must be followed by all producers. They demonstrate conformity with the relevant parts of BS EN 13108 and apply whether or not CE marking is being done.

Full details are given in two BS EN Standards:

BS EN 13108-20 Bituminous mixtures. Material specifications. Type testing

BS EN 13108-21 Bituminous mixtures. Material specifications. Factory production control.

Guidance about how the evaluation of conformity is applied in the UK is given in:

PD 6691 Asphalt – Guidance on the use of BS EN 13108. Bituminous Mixtures, Material specifications

Evaluation of conformity requires testing. The test methods are published as:

BS EN 12697 Bituminous mixtures. Test methods for hot mix asphalt

BS EN 12697 is published in more than forty different Parts.

Guidance about the use of the long list of test methods is given in:

PD 6692 Asphalt – Guidance on the use of BS EN 12697. Bituminous Mixtures, Test methods for hot mix asphalt

BS EN 12697 will replace most Parts of:

BS 598 Sampling and examination of bituminous mixtures for roads and other paved areas. (Part 100 to Part 112)

Type testing

Type testing is the process used by a producer to show that the mixture conforms to all of the requirements of the specification.

The BS EN Standards define the properties of the mixture arriving on site – ‘in the back of the delivery vehicle’ and before laying and compaction. This means that there is an emphasis on tests to confirm the properties that the mixture can achieve if it is laid properly.

Type testing is similar to the ‘mixture design validation’ and ‘job mix trial’ procedures used on some major contracts. It is different to using site tests to confirm that the finished layer has achieved a specified level of performance.

The Type Test for a bituminous mixture is based on:

- A list of the types and sources of the constituents
- Test data to confirm that the constituents comply with relevant Standards

- A declaration of the target composition for the mixture
- Test data to confirm that the mixture conforms with any performance criteria (such as air voids content, wheel tracking and stiffness).

The resulting Type Test Report is used as a starting point for production control. The Type Test Report is specific to the mixture and not to the production plant. BS EN 13108 uses a 'family approach' to avoid unnecessary testing and validation.

Type testing applies to all bituminous mixtures, including those that are often considered as 'recipe mixtures'. The type testing procedure for a mixture is repeated at least once every five years.

Factory production control (FPC)

FPC is the procedures used to ensure that the mixtures with a Type Test Report are produced in a consistent way so that they conform with the relevant specification.

FPC is based on a schedule for a quality system that includes requirements for mixture temperature, mixture 'target' composition (with tolerances) and the frequency of sampling and testing.

Test methods

The BS EN 12697 test methods most relevant to routine work in the UK are:

BS EN 12697-1	Bituminous mixtures. Test methods for hot mix asphalt. Soluble binder content
BS EN 12697-2	Bituminous mixtures. Test methods for hot mix asphalt. Determination of particle size distribution
BS EN 12697-13	Bituminous mixtures. Test methods for hot mix asphalt. Temperature measurement
BS EN 12697-27	Bituminous mixtures. Test methods for hot mix asphalt. Sampling
BS EN 12697-28	Bituminous mixtures. Test methods for hot mix asphalt. Preparation of samples for determining binder content etc.

BS EN 12697 also covers the use of binder ignition method for determining bitumen content without the use of solvents:

BS EN 12697-39	Bituminous mixtures. Test methods for hot mix asphalt. Binder content by ignition
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The BS EN Standards use a 'menu' approach that repeats important elements of the BS 598 test methods, but some points of detail are different.

Two important differences are:

- Density correction — The calculation of binder content includes an adjustment factor for aggregate density. A 'standard' aggregate particle density of 2.65 Mg/m³ is used. The correction allows the volume of bitumen in different mixtures to be compared.
- 'Adjustment' of binder and filler content — the binder and filler content of is not 'adjusted' to reflect the proportion of fine aggregate found relative to the 'midpoint target'.

Quality management

The SHW requires the production of bituminous mixtures to be carried out in accordance with:

Quality Management in Highway Works, Sector Scheme 14
Quality management of the production of asphalt mixes

The sector scheme details how a quality management system (QMS) complying with BS EN 9001 can be developed and maintained by a supplier of mixtures.

The sector scheme document is being revised to align it with the requirements of the BS EN Standards for type testing and factory production control.

Sector scheme documents are published by United Kingdom Accreditation Service (UKAS). Copies can be downloaded from: www.ukas.com. Click on the UKAS Publications (M4) list under Information Centre. Then scroll down to the list of Sector Schemes in the section about publications related to certification body accreditation.