

Aggregates EN-day is fast approaching

Introduction

The signing of the Construction Products Directive (CPD) by the UK in 1988 marked the start of the work to develop common European Standards, by CEN, across the construction sector. The overarching aim of the CPD is the removal of barriers to trade between the participating countries by an overall unification and simplification of the existing national technical requirements.

For aggregates the culmination of this activity comes in the UK on the 1 January 2004 when a series of product standards plus supporting test methods are adopted. Thereafter the existing British Standards will be withdrawn in June 2004.

To help material producers, specifiers and users to apply the new standards a series of National Guidance Documents have been prepared so that the established requirements used in the UK can continue to be called-up.

A full schedule of the new product standards, test methods and national guidance is presented inside this bulletin sheet. Further bulletin sheets in this series consider, in greater detail, the impact of the changes on aggregates used in the following applications:

- concrete
- mortar
- asphalt
- unbound and hydraulically bound materials

The key changes

It must be recognised by all producers, specifiers and users that the basic materials,

the aggregates, essentially remain the same.

What does change, however, is:-

- the terminology
- the product descriptions
- the standard sieve sizes
- the grading presentation
- test methods
- Factory Production Control (FPC) and CE Marking

Unlike existing British Standards, recycled aggregates are now included within the scope of the new product standards.

Terminology

Terms and definitions in all the new product standards are now consistent, but it is worth highlighting the following:

- coarse vs fine aggregate is now split at 2mm for asphalt and 4mm for all other uses.
- **finer** - is the inherent fraction of an aggregate passing 0.063mm
- **filler** - is material passing 0.063mm that may be added to influence the properties of a mixture.
- **category** - is the level of an aggregate property and may indicate a range or a limiting value.

Product Descriptions

Product sizes are now based on the respective lower (d) and upper (D) sieve sizes expressed as "d/D"

Hence for aggregates for concrete against BS 882, for example:

- 20mm single size becomes 10/20
- 10mm single size becomes 4/10
- 20 to 5mm graded becomes 4/20
- M (medium) sand becomes 0/4 or 0/2 (MP)

and for aggregates for asphalt against BS 63, for example:

- 20mm single size becomes 14/20 or 10/20
- 10mm single size becomes 6.3/10 or 4/10 subject to the designated end use.

Close reference to the National Guidance Document is, therefore, most important when selecting particular aggregates. Please refer to the further Bulletins in the QPA's 'Information on New European Standards - Aggregates' series: Bulletin 2 for Aggregates in Concrete, Bulletin 3 for Aggregates in Mortar, Bulletin 4 for Aggregates in Asphalt and Bulletin 5 for Unbound and Hydraulically Bound Aggregates.

Standard Sieves

The European product standards give two options for the selection of sieves for grading and product description purposes. The UK has elected to use "basic set plus set 2" with the recommended sequence for coarse and fine aggregates as shown in Table 1 on the next page.



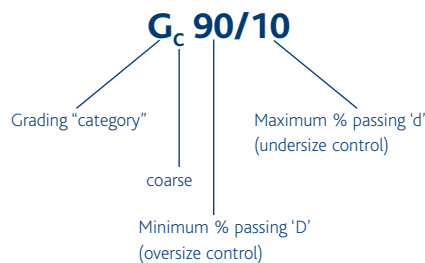
Table 1 Standard sieves as defined by the National Guidance Documents

coarse aggregate general and concrete	80mm	coarse aggregate asphalt
	63mm	
	40mm	
	31.5mm	
	20mm	
	16mm	
	14mm	
	10mm	
	8mm	
	6.3mm	
fine aggregate general and concrete	4mm	fine aggregate asphalt
	2.8mm	
	2mm	
	1mm	
	0.500mm	
	0.250mm	
	0.125mm	
	0.063mm	

Grading presentation

The traditional method of setting a defined grading envelope has been replaced by the use of a producers "declared" grading with given tolerances providing the control on key sieves together with restrictions on the permitted amount of oversize or undersize material.

For example the grading classification would be presented as



Test Methods

A total of 36 test methods have been prepared. Some are the same as existing BS methods: some have a similar approach but

are not identical; some are entirely new; some existing tests will be lost completely. The national guidance document references all the test methods under the new system and highlights the differences to be aware of.

Factory Production Control (FPC) and CE Marking

Each product standard incorporates clauses setting out the requirements for FPC and a schedule of minimum test frequencies necessary for meeting the ongoing conformity of the product.

The producer shall declare the results of the FPC system which is based on general safety considerations. For aggregates used in highway surfaces skid resistance is the critical factor and hence 'Attestation Level 2+' requiring third party assessment is necessary. Aggregates for all other purposes are subject to 'Attestation Level 4' which is dependent on self assessment.

Compliance with the FPC enables producers to demonstrate product conformity with the defined essential requirements of the product and hence attach the CE Mark as the declaration of such conformity.

Implications of the change

From 1 January 2004 it is the intention for all aggregate materials to be supplied against the new standards. Consequently, all contract specifications - such as the specification for Highway Works - need to be revised in preparation for new works. Existing contracts likewise will need to acknowledge the change in product supply.

Conclusion

In all respects the National Guidance Documents are the most important points of reference to facilitate this change. However, the fundamental message still is - the basic materials, the aggregates, remain the same but it is the terminology, etc that changes.

For further information

Contact Brian James on
 Telephone 020 7730 8194
 Fax 020 7730 4355
 Email james@qpa.org
 or refer to
http://www.qpa.org/pro_agg.htm

Schedule of BS documents

Implementation of European Aggregates Standards

Product Standards

BS EN 13139	Aggregates for mortar
BS EN 12620	Aggregates for concrete
BS EN 13043	Aggregates for bituminous mixtures and surface treatments
BS EN 13242	Aggregates for unbound and hydraulically bound materials
BS EN 13383	Armourstone
BS EN 13450	Railway ballast
BS EN 13055-1	Lightweight aggregate for concrete
BS EN 13055-2	Lightweight aggregate for bound and unbound materials

National Guidance Documents

PD 6682-1	Aggregates for concrete
PD 6682-2	Aggregates for asphalt and chippings
PD 6682-3	Aggregates for mortar
PD 6682-4	Lightweight aggregates for concrete and mortar
PD 6682-5	Lightweight aggregates for other uses
PD 6682-6	Aggregates for unbound and hydraulically bound materials
PD 6682-7	Aggregates for armourstone
PD 6682-8	Aggregates for railway ballast
PD 6682-9	Test methods for aggregates

Test methods - General

BS EN 932 is published in the following parts:

Part 1	Methods for sampling
Part 2	Methods for reducing laboratory samples
Part 3	Procedure and terminology for simplified petrographic description
Part 4	Not used
Part 5	Common equipment and calibration
Part 6	Definitions of repeatability and reproducibility

Test methods - Geometrical Properties

BS EN 933 is published in the following parts:

Part 1	Determination of particle size distribution - sieving method
Part 2	Determination of particle size distribution - test sieves, nominal size of apertures
Part 3	Determination of particle shape - flakiness index
Part 4	Determination of particle shape - shape index
Part 5	Determination of percentage of crushed and broken surfaces in coarse aggregate particles
Part 6	Assessment of surface characteristics - flow coefficient of aggregates
Part 7	Determination of shell content - percentage of shells in coarse aggregates
Part 8	Assessment of fines - sand equivalent test
Part 9	Assessment of fines - methylene blue test
Part 10	Assessment of fines - grading of fillers (air jet sieving)

Test methods - Physical and Mechanical

BS EN 1097 is published in the following parts:

- | | |
|----------------|--|
| Part 1 | Determination of the resistance to wear (micro-Deval) |
| Part 2 | Methods of the determination of resistance to fragmentation |
| Part 3 | Determination of loose bulk density and voids |
| Part 4 | Determination of the voids of dry compacted filler |
| Part 5 | Determination of water content by drying in a ventilated oven |
| Part 6 | Determination of particle density and water absorption |
| Part 7 | Determination of the particles density of filler - Pyknometer method |
| Part 8 | Determination of the polished stone value |
| Part 9 | Determination of the resistance to wear by abrasion from studded tyres - Nordic test |
| Part 10 | Water suction height |

Test methods - Thermal and Weathering

BS EN 1367 is published in the following parts:

- | | |
|---------------|---|
| Part 1 | Determination of resistance to freezing and thawing |
| Part 2 | Magnesium sulfate test |
| Part 3 | Boiling test for "Sonnenbrand" basalt |
| Part 4 | Determination of drying shrinkage |
| Part 5 | Determination of resistance to thermal shock |

Test methods - Chemical

BS EN 1744 is published in the following parts:

- | | |
|---------------|---|
| Part 1 | Chemical analysis |
| Part 2 | Determination of resistance to alkali reaction |
| Part 3 | Preparation of eluates by leaching of aggregates |
| Part 4 | Water susceptibility of fillers for bituminous mixtures |

All documents are available from

Customer Services at British Standards Institution

389 Chiswick High Road London W4 4AL Tel 020 8996 9001 Fax 020 8996 7001

e-mail orders@bsi-global.com website www.bsi-global.com



Providing Essential Materials for Britain

The trade association for the aggregate, asphalt and ready-mixed concrete industries

156 Buckingham Palace Road London SW1W 9TR Tel 020 7730 8194 Fax 020 7730 4355
info@qpa.org www.qpa.org