O3 – Concrete Products

The Other Products Zone of the Standards and Specification Area covers uses of aggregates in specialist products. This Topic page covers:

- Concrete blocks and masonry units
- Precast concrete products.

Concrete blocks and masonry units

Concrete blocks made with aggregates are classified as:

- Dense aggregate blocks – concrete with a density of 1,800 to 2,100kg/m^3
- Lightweight aggregate blocks – concrete with a density of 850 to 1,500kg/m^3.

Natural aggregates are usually used in dense aggregate blocks, but may be blended with lightweight aggregates to reduce the density of the concrete.

The Standard for concrete bricks and blocks is:

BS EN 771-3 Aggregate concrete masonry units

The BS EN Standard has been in use since April 2006. It replaced a British (BS) Standard:

BS 6073-1 Specification for precast concrete masonry units

The trade association for the industry is the Concrete Block Association (CBA) who publish an extensive series of technical guides that can be downloaded from their website. Details can be found on: www.cba-blocks.org.uk

Dimensions of concrete blocks

In the UK, most concrete blocks have a face size of 440mm length and 215mm height.

When used with a 10mm wide mortar joint, this face size for blocks coordinates with a the standard brick face size of 215mm length and 65mm height.

The thickness of blocks varies from 75mm to 215mm. 100mm thickness is the most common size used for general building work. Thicker blocks may require mechanical handling.

Block type

The types of blocks in routine use are:

- Solid blocks
- Cellular blocks – with voids that do not fully penetrate the block
- Hollow blocks – with voids that extend for the full height of the block.

A wide range of ‘special’ shapes are also made by some manufacturers. Hollow blocks can also be filled with insulating material.

The relative percentage of vertical voids in cellular and hollow blocks is used in design calculations (BS EN 1996, Eurocode 6, Design of masonry structures).

Block strength

Blocks are classified by their average compressive strength, expressed in N/mm². The strength class is chosen to reflect the design requirements of the masonry structure.

During manufacture, the actual strength is controlled by varying the proportions of aggregates and water in the chosen concrete mix, and its cement content.

Because BS EN 771-3 is written as a 'performance standard', block strength must be monitored as part of a factory production control system.

The BS EN method of assessing block strength is slightly different to that used in (superseded) BS 6073-1. This means that the strength classes used now are numerically slightly higher than those used prior to the introduction of BS EN 771-3.

The strength of blocks in routine use is generally:

Solid blocks	7.3, 10.4 and 17.5 N/mm²
Cellular and hollow blocks	3.6 and 7.3 N/mm²

Precast concrete products

Aggregates are used in the manufacture of a wide range of precast concrete products for road construction and maintenance, including:

- Concrete paving blocks
- Concrete paving flags
- Concrete kerb units.

Each product is specified in a BS EN Standard that replaced a British (BS) Standard:

BS EN 1338,	Concrete paving blocks	Replaced BS 6717
BS EN 1339,	Concrete paving flags	Replaced BS 7263-1
BS EN 1340,	Concrete kerb units	Replaced BS 7263-3

The BS EN Standards cover both requirements for the products and the associated test methods.

The code of practice for using concrete paving blocks, paving flags and kerbs is:

BS 7533	Pavements constructed with clay, natural stone or concrete pavers

This British (BS) Standard is published in twelve Parts that cover a wide range of products and types of road pavement.

The trade association for the precast concrete products industry is Interpave - The Precast Concrete Paving and Kerb Association.

Interpave publishes a series of technical guides and information sheets that can be downloaded from their website. Details can be found on: www.paving.org.uk.

Interpave is a Product Association within the British Precast Concrete Federation (BPCF), the trade association for all precast concrete products used in construction.

Details of the activities of BPCF can be found on: www.britishprecast.org.uk. This website has links to a long list of associated sites.

The Concrete Block Association (CBA) is affiliated to the British Precast Concrete Federation.