



# **Specification for precast concrete units**

## **Part 3: Autoclaved aerated concrete masonry units**

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### Foreword

With a view to have a comprehensive set of unified Dubai Municipality Standards which would be consistent and appropriate to local conditions and yet be at par with International Standards, the Dubai Central Laboratory Department is formulating standards taking guidance as much as possible from International and Regional Norms.

Local Order 44 issued in 1990 on “Standard Specifications of Concrete Blocks Used in the Emirate of Dubai” and its related Administrative Orders specify the requirements for the manufacture and use of pre-cast concrete blocks. Since it was issued, there has been new developments in terms of materials, block types and manufacturing technology which necessitated revision to the Order.

In view of the above, this DM Standard Specification (DMS 1) is being formulated in four parts as follows:

- Part 1: Normal-weight masonry and filler blocks
- Part 2: Light-weight masonry units
- Part 3: Autoclaved aerated concrete masonry units
- Part 4: Paving blocks

As seen, parts 1 to 3 are formulated by type of material to be inline with BS EN 771 series.

| Amendments issued since publication |           |  |
|-------------------------------------|-----------|--|
| Amd No.                             | Date      | Text affected  |
| DMS 1: P3: AMD 1                    | May 2004  | Indicated by a side bar on the right margin            |
| DMS 1: P3: AMD 2                    | Nov. 2005 | Clause 5.2<br>Indicated by underlined highlighted font |
| DMS 1: P3: AMD 3                    | July 2006 | Clause 5.1<br>Indicated by <b>bold underlined</b> text |



## 1. Scope

This standard specifies materials and minimum performance levels for autoclaved aerated concrete masonry units.

## 2. References

This standard incorporates provisions from other references. These references are cited undated at the appropriate points in the text, but latest edition of these references applies (including amendments). The titles of these references are listed on the last page.

## 3. Definitions

### 3.1 AAC block

a block manufactured from hydraulic binders such as cement and/or lime, combined with siliceous based fine materials (sand), cell generating material and water. AAC blocks are intended for use in the construction of walls.

*NOTE: The raw materials are mixed together and cast into moulds where the mix is allowed to rise and set into cakes. After this process, the cake is cut into the required sizes of blocks and cured with high pressure steam in autoclaves.*

### 3.2 lot

the term "Lot" refers to any number of AAC concrete blocks of any configuration or dimension manufactured by the producer using the same materials, concrete mix, manufacturing process, and curing method.

## 4. Materials of manufacture

The following materials of manufacture combined with additives and agents where appropriate may be used in the manufacturing process:

- Cement conforming to the requirements of BS 12;
- Lime conforming to the requirements of BS 890;
- Water conforming to the requirements of BS EN 1008;
- Silicious based material;
- Cell-generating material.

## 5. General requirements

### 5.1 Gross density

Block manufacturers shall declare the **maximum** gross density of each type and configuration of their masonry blocks. Declared gross density shall not be more than 850 kg/m<sup>3</sup>.

When tested in accordance with BS EN 772: Part 13, the gross density of each type and configuration of the masonry blocks shall not exceed the declared value **by more than  $\pm 10\%$** .

### 5.2 Chloride and sulphate content

When tested in accordance with BS 1881: Part 124, the acid soluble chloride (Cl) and sulphate (SO<sub>3</sub>) content of blocks shall not exceed 0.05% and 1.0% by mass of dry concrete respectively.

### 5.3 Drying shrinkage

When tested in accordance with BS EN 680, the average drying shrinkage shall not exceed 0.9 mm/m.

### 5.4 Thermal conductivity

For blocks intended to be used in elements subject to thermal requirements, thermal conductivity of blocks shall be declared by the manufacturer according to BS EN ISO 10456 at 35°C and 60% relative humidity (RH).

When tested in accordance with ASTM C 518 at 35°C and 60% RH AAC thermal conductivity shall not exceed the declared value.

## 6. AAC masonry blocks

### 6.1 Sizes

#### 6.1.1 Work size

The size of a masonry block specified for its manufacture, to which its actual size should conform within specified permissible deviations. The purchaser shall specify the work size. Table 1 gives most frequently used work sizes of blocks.

**Table 1 – Works sizes and tolerances of blocks**

|   | Length (mm) | Height (mm) | Thickness (mm)     |
|---|-------------|-------------|--------------------|
| Dimensions  | 390 - 590   | 200 - 250   | 250, 200, 150, 100 |
| Tolerances  | ± 3         | ± 1.5       | ± 2                |
| NOTE Other work sizes may also be used as per requirements. |             |             |                    |

#### 6.1.2 Dimensions

The dimensions of blocks shall be declared by the manufacturer.

#### 6.1.3 Tolerances

When measured in the manner described in BS EN 772-16, the tolerances in length, height or thickness of each block from the sample shall not exceed the limits shown in Table 1.

### 6.2 Strength

When tested at the air-dry condition in accordance with BS EN 772: Part 1, the average normalized compressive strength and that of an individual specimen shall be not less than the values given in Table 2.



Table 2 - Minimum compressive strength of masonry blocks in N/mm<sup>2</sup>

| Average  | Individual |
|--|------------|
| 3.2  | 2.6        |
| NOTE 1: Designers may specify blocks of higher strengths than those given in this table if required. |            |

### 6.3 Sampling for tests

#### 6.3.1 Number of Specimens

The number of specimens required for each specified test shall be:

- Dimension and Compressive strength 6
- Concrete density 6
- Chloride and Sulphate content 1
- Drying shrinkage 3

#### 6.3.2 Selection of test specimens

A representative sample of masonry blocks required for test purposes shall be selected at random from every designated lot of 20,000 blocks or fraction thereof. Each specimen shall be marked so that it may be identified at any time.



**Publications referred to**

|                    |   |
|--------------------|---|
| BS 12              | Specification for Portland cement   |
| BS 890             | Building limes  |
| BS 1881: Part 124  | Method for analysis of hardened concrete  |
| BS 6073: Part 1    | Specification for precast concrete masonry units  |
| BS 6073: Part 2    | Method for specifying precast concrete masonry units  |
| BS EN 680          | Determination of drying shrinkage of autoclaved aerated concrete  |
| BS EN 772: Part 1  | Methods of test for masonry units – Part 1: Determination of compressive strength   |
| BS EN 772: Part 13 | Methods of test for masonry units – Part 13: Determination of net and gross density of masonry units (except for natural stone) |
| BS EN 772-16       | Determination of dimensions   |
| BS EN 1008         | Mixing water for concrete   |
| BS EN ISO 10456    | Building materials and products – Procedures for determining declared design thermal values                                     |
| ASTM C 518         | Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus                 |