Admixture for concrete, mortar, and grout part 3: admixtures for masonry mortar—requirements
TECHNICAL COMMITTEE REPRESENTATION

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1. Architectural Association of Kenya
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4. Consumer Information Network
5. Howards Humphrey East Africa LTD
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7. Kenya Industrial Research and Development Institute (KIRDI)
8. Kenya Institute of Highways and Building Technology (KIHBT)
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REVISION OF KENYA STANDARDS

In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.
KS 2177: 2017

This Kenya Standard was revised by the Concrete Technical Committee, under the guidance of the standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

This standard is part of the series KS 2770 “Admixtures for concrete, mortar and grout”, which is comprised of the following additional parts:

— Part 1 Admixtures for concrete, mortar and grout—Common requirements
— Part 2 Concrete admixtures — Definitions, requirements, conformity, marking and labelling
— Part 3 Admixtures for masonry mortar — Definitions, requirements, conformity, marking and labelling
— Part 4 Admixtures for grout for prestressing tendons - Definitions, requirements, conformity, marking and labelling
— Part 5 Admixtures for sprayed concrete - Definitions, requirements, conformity, marking and labelling
— Part 6 Sampling, conformity control and evaluation of conformity

This draft Standard is used with the standards of the KS 2769 : 2017 series which comprises the test methods for admixtures.
Admixture for concrete, mortar, and grout part 3: admixtures for masonry mortar- requirements

1. Scope

This Standard defines and specifies the requirements and conformity criteria for admixtures for use in cement based masonry mortar.

It covers two types of admixtures, long term retarding and air entraining/plasticising which are used in ready-mixed and site made masonry mortars.

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

KS 2769-13, Admixtures for concrete, mortar and grout — Test methods — Part 13: Reference masonry mortar for testing mortar admixtures

KS 2770-1, Admixtures for concrete, mortar and grout — Part 1: Common requirements

KS 2770-2, Admixtures for concrete, mortar and grout — Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and labelling

KS 2770-6, Admixtures for concrete, mortar and grout - Part 6: Sampling, conformity control and evaluation of conformity

KS 2770-6, Admixtures for concrete, mortar and grout — Part 6: Sampling, conformity control and evaluation of conformity

EN 1015-4, Methods of test for mortar for masonry — Part 4: Determination of consistence of fresh mortar (by plunger penetration)

EN 1015-7, Methods of test for mortar for masonry — Part 7: Determination of air content of fresh mortar

EN 1015-9, Methods of test for mortar for masonry — Part 9: Determination of workable life and correction time of fresh mortar

EN 1015-11, Methods of test for mortar for masonry — Part 11: Determination of flexural and compressive strength of hardened mortar

3. Terms and definitions

For the purposes of this document, the definitions in KS 2770-1:2008 and the following apply.

3.1. air entraining/plasticizing admixture

admixture which increases workability, or allows water reduction, by incorporating during mixing a controlled quantity of small, uniformly distributed air bubbles which remain after hardening

3.2. set retarding admixture for long term retarded masonry mortar

set retarding admixture as defined in KS 2770-2 but specifically intended for use in long term retarded mortar incorporating entrained air

3.3. performance
ability of an admixture to be effective in its intended use without detrimental effect

3.4. compliance dosage
dosage of an admixture, expressed in % by mass of cement, stated by the manufacturer, which will meet the requirements of this Standard. The compliance dosage is within the recommended range of dosage

3.5. recommended range of dosage
dosages between limits, expressed in % by mass of cement, which the manufacturer recommends for the product based on experience on site

NOTE The use of the recommended dosage does not imply that compliance with this standard will be achieved over the whole range. Trial tests should be carried out with the materials to be used on site, to find the dosage necessary to achieve the required result.

3.6. maximum recommended dosage
upper limit of the recommended range of dosage

4. Requirements
Masonry mortar admixtures, when sampled in accordance with KS 2770-6 and KS 2770-6, shall comply with the requirements in KS 2770-1. Table 1 using the test methods listed therein and the additional requirements specific to different types of admixture listed in Table 1 below.

NOTE 1 Tests should be carried out with the admixtures and other materials intended to be used in the mortar to check whether the desired effect can be obtained.

Table 1 — Additional requirements for specific types of admixture

<table>
<thead>
<tr>
<th>Definition</th>
<th>Name of admixture</th>
<th>Additional requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Air entraining/plasticizing mixture</td>
<td>Table 2</td>
</tr>
<tr>
<td>3.2</td>
<td>Set retarding admixture for long term retarded masonry mortar</td>
<td>Table 3</td>
</tr>
</tbody>
</table>

Table 2 — Additional requirements for air entraining/plasticizing admixtures at equal consistence

<table>
<thead>
<tr>
<th>Property</th>
<th>Reference mortar</th>
<th>Test method</th>
<th>Requirement a</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Air content after standard mixing</td>
<td>KS 2769-13</td>
<td>EN 1015-7 method A</td>
<td>Total air content $A_2 = (17 \pm 3)$ % by volume</td>
</tr>
<tr>
<td>2 Air content after 1 h standing</td>
<td>KS 2769-13</td>
<td>EN 1015-7 method A</td>
<td>$\geq A_1 - 3$ %</td>
</tr>
<tr>
<td>3 Air content after extended mixing</td>
<td>KS 2769-13</td>
<td>EN 1015-7 method A</td>
<td>$\leq A_1 + 5$ % and $\geq A_1 - 5$ %</td>
</tr>
<tr>
<td>4 Reduction in water requirement for standard consistence</td>
<td>KS 2769-13</td>
<td>EN 1015-13</td>
<td>$\geq 8$ % by mass</td>
</tr>
<tr>
<td>5 Compressive strength at 28 days</td>
<td>KS 2769-13</td>
<td>EN 1015-11</td>
<td>Test mix $\geq 70$ % of control mix</td>
</tr>
</tbody>
</table>

aAll requirements apply to the same test mix.
Table 3 — Additional requirements for admixtures for long term retarded, ready to use mortar at equal consistence

<table>
<thead>
<tr>
<th>Property</th>
<th>Reference mortar</th>
<th>Test method</th>
<th>Requirement a</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Air content after standard mixing</td>
<td>KS 2769-13</td>
<td>EN 1015-7 method A</td>
<td>Total air content A2 = (17 ± 3) % by volume</td>
</tr>
<tr>
<td>2 Air content after extended mixing</td>
<td>KS 2769-13</td>
<td>EN 1015-7 method A</td>
<td>≤ A2 + 5 % and ≥ A2 - 5 %</td>
</tr>
<tr>
<td>3 Consistence after 28 h standing b</td>
<td>KS 2769-13</td>
<td>EN 1015-4</td>
<td>Within 15 mm of initial value</td>
</tr>
<tr>
<td>4 Air content after 28 h standing</td>
<td>KS 2769-13</td>
<td>EN 1015-7 method A</td>
<td>≥ 0.70A2 %</td>
</tr>
<tr>
<td>5 Resistance to penetration after 72 h c</td>
<td>KS 2769-13</td>
<td>EN 1015-9</td>
<td>Test mix ≥1.0 N/mm²</td>
</tr>
<tr>
<td>6 Compressive strength at 28 days</td>
<td>KS 2769-13</td>
<td>EN 1015-11</td>
<td>Test mix ≥ 70 % of control mix</td>
</tr>
</tbody>
</table>

a All requirements apply to the same test mix.
b When stored and remixed in accordance with KS 2769-13, 5.3, as for determination of air content, after 28 h standing.
c When stored in a covered mould for 28 h to prevent evaporation of water and then stored in an uncovered penetration resistance mould for further 44 h at (65±5) % RH.
d The air entrainment may be as a result of the admixture containing both retarding and air entraining properties or by the separate addition of an air entraining admixture complying with Table 2.

5. Sampling
Requirements for sampling are given in KS 2770-6.

6. Conformity control
Requirements for conformity control are given in KS 2770-6. The frequency of testing in connection with the factory production control is given in Table 4.

Table 4 — Minimum frequency of test for factory production control

<table>
<thead>
<tr>
<th>Tests</th>
<th>Air entraining plasticizing admixture</th>
<th>Admixture for long term retarded, ready to use mortar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homogeneity, colour</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Relative density (for liquids only)</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Conventional dry material content</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>pH value (for liquids only)</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Chloride content (Cl) a</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Compressive strength at 28 days</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Air content after standard mixing</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Air content after extended mixing</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Air content after 1 h standing</td>
<td>A</td>
<td>–</td>
</tr>
<tr>
<td>Air content after 28 h standing</td>
<td>–</td>
<td>A</td>
</tr>
</tbody>
</table>
Reduction in water requirement for standard consistence | A | – |
Consistence after 28 h standing | – | A |
Resistance to penetration after 72 h | – | A |

Numbers in this table denote minimum frequency of test per year, spread according to production; if the production is less frequent every batch has to be tested:
A: means test for every 500 t with a minimum of 2 times a year
B: means test for each batch

NOTE The effective component (infrared analysis) need not be included in the programme of factory production control. It has to be included in initial type testing.

* Total chlorine content also has to be tested at this frequency if it is significantly different from the chloride content.

For Factory Production Control, the reference cement required by KS 2769-13 may be replaced by an alternative cement provided that the:

a) alternative cement has been tested in the KS 2769-13 reference mortar in parallel with the reference cement to KS 2769-13 for initial Type Testing with the same admixture type;
b) admixture type so tested showed compliance with the appropriate table of requirements in this Standard with both the KS 2769-13 reference cement and the alternative cement.

7. Evaluation of conformity
Requirements for evaluation of conformity are given in KS 2770-6.

8. Marking and labelling

8.1. General
When admixtures for masonry mortar are supplied in containers they shall be clearly marked with the relevant information. When the material is supplied into a bulk container at the point of delivery, the same information shall be provided in writing at the time of delivery.

8.2. Designation of admixtures
Admixtures for masonry mortar shall be designated by:
a) name of type of admixture in English language;
b) number of this Standard, i.e. KS 2770-3;
c) code, to identify the type of admixture, consisting of the number of this Standard and the number of the table which gives the additional performance requirements for the particular type of admixture.

EXAMPLE Long term retarding admixture for masonry mortar; KS 2770-3; T.3

8.3. Additional information
a) Batch number and production plant;
b) A summary of storage requirements including any special requirements on storage life which shall be clearly marked, e.g: This admixture shall not be taken to comply with KS 2770-3 after "date";
c) Instructions for use and any necessary safety precautions, e.g. if caustic, toxic or corrosive;
d) The manufacturer's recommended range of dosage.