

**KENYA STANDARD**

**KS2770-6:2021**

ICS ###.###

1<sup>st</sup> Edition

## **Admixtures for concrete, mortar and grout**

### **Part 6:**

**Sampling, assessment and verification of the constancy of performance.**



**Kenya Bureau of  
Standards**

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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.

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# Admixtures for concrete, mortar and grout

## Part 6:

### Sampling, assessment and verification of the constancy of performance.

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## Foreword

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

The KS 2770 consist of the following parts, under the general title *Admixtures for concrete, mortar and grout*

- *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.*

During the preparation of this standard, reference was made to the following document (s):

EN 934-6:2019 **Admixtures for concrete, mortar and grout Part 6: Sampling, assessment and verification of the constancy of performance.**

Acknowledgement is hereby made for the assistance derived from this (these) source (s) |

This draft Standard is used with the standards of the KS 2769: 2017 series which comprises the test methods for admixtures.



# Admixtures for concrete, mortar and grout

## Part 6:

### Sampling, assessment and verification of the constancy of performance

#### 1. Scope

This document specifies the procedures for sampling and for the assessment and verification of the constancy of performance (AVCP) for admixtures covered by the series KS 2770.

#### 2. Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 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 - 3, *Admixtures for concrete, mortar and grout - Part 3: Admixtures for masonry mortar - Definitions, requirements, conformity and marking and labelling*

KS 2770 - 4, *Admixtures for concrete, mortar and grout — Part 4: Admixtures for grout for prestressing tendons — Definitions, requirements, conformity, marking and labelling*

KS 2770 - 5, *Admixtures for concrete, mortar and grout — Part 5: Admixtures for sprayed concrete — Definitions, requirements, conformity, marking and labelling*

#### 3. Terms and definitions

For the purposes of this document, the following terms and definitions apply.

##### 3.1.

##### **batch**

quantity of admixture which can be considered to have a uniform composition

NOTE A tank load can be considered as the equivalent of a batch.

##### 3.2.

##### **responsible person**

person appointed by the manufacturer whose duties include implementation of all or a defined part of the production control manual

#### 4. Sampling

##### 4.1. General

Sampling of admixtures shall be carried out in such a way that the resulting sample is representative of the batch to be inspected.

The following procedures shall be used:

- for type testing and in case of dispute, 4.2;
- at time of delivery, 4.3;
- for factory production control, 4.4.

If required, sampling shall be carried out in the presence of all the parties concerned.

## **4.2. Sampling from the manufacturer's stock**

### **4.2.1. General**

Each sample shall represent not more than one batch. For continuous production of an admixture, one sample taken from up to 25 t may be regarded as representative.

### **4.2.2. Powder admixture (in packages)**

The sample shall be composed of sub-samples from 6 packages (bags) or if the total number of packages(bags) is less than 6, from all packages (bags). The sub-samples are to be taken from packages (bags) distributed at random throughout the consignment.

One of the following procedures shall be applied:

- a) where the packages contain up to 500 g, take all the contents of each package;
- b) where the packages contain more than 500 g, use one of the following methods:
  - 1) insert a sampling tube, which takes a core not less than 25 mm in diameter, into the packages so that it takes a core of the material from substantially the entire length of the package
  - 2) empty one of the packages to be sampled on to a clean dry surface and mix the material. Take at least three portions of not less than 125 g each from different parts of the heap.

The method given in 1) is the preferred method, but if a sampling tube is not available, the method given in 2) shall be used. Repeat the procedure with each of the other packages to be sampled and thoroughly mix the sub-samples obtained to form one bulk sample. If the bulk sample exceeds 3 kg, it shall be reduced to 3 kg, either by coning and quartering or by use of a sample splitter. Divide the sample into three equal parts and place each part in a clean, air tight, labelled container. At least one container holding 1 kg shall be kept for future reference. Store container(s) in a place that is protected from moisture, heat and light for one year or until the use-by date, whichever is the shorter period.

### **4.2.3. Liquid admixture**

#### **4.2.3.1. General**

In order to achieve representative samples of liquid admixtures, one of the following procedures shall be applied.

#### **4.2.3.2. Sampling of a liquid admixture from containers**

The sample shall be composed of sub-samples taken from 6 containers or if the total number of containers is less than 6 from all containers. The sub-samples are to be taken from containers distributed at random throughout the consignment.

Agitate the admixtures in the containers to disperse all lightly settled material. Disregard all deposits which are not readily brought into suspension by such agitation

Without delay, take sub-samples from the selected containers by one of the following procedures:

- a) where containers hold up to 0.5 l, take the total contents;

b) where containers hold more than 0.5 l take 0.5 l of the liquid from each container, combine the sub- samples obtained in this way and mix them thoroughly to form one bulk sample.

#### **4.2.3.3. Sampling of a liquid admixture from a tank load**

When the load is agitated, one sample may represent the entire tank load of up to 25 000 l. The bulk sample shall be at least 3 l.

Otherwise, three samples shall be taken as follows: one from the top level, one within  $\pm 300$  mm of the mid-level of the fluid and one within 400 mm of the bottom of the tank. Each sample shall be not less than 1 l. Thoroughly mix the three samples until they form one homogeneous bulk sample.

#### **4.2.3.4. Division of sample**

The bulk sample obtained by one of the procedures described above (4.2.3.2 or 4.2.3.3) shall be divided into 3 equal samples. Place in three clean bottles, label and tightly stopper. At least one bottle shall be kept for future reference for one year or until the use by date, whichever is the shorter period.

Store the bottle(s) in a place that is protected from heat, frost and light.

### **4.3. Sampling at delivery**

When sampling of a consignment of an admixture is required, the sampling shall be carried out before unloading at the point and time of delivery.

### **4.4. Sampling for factory production control**

Sampling procedures for factory production control shall be documented in the production control manual. The procedure shall ensure that a representative sample is obtained.

As a guide, at least one sample per batch or, in the case of continuous production, at not more than 25 t intervals. After testing, a sample of not less than 250 ml should be retained for at least one year or the shelf life of the product, if longer. If the normal admixture dosage exceeds 2 %, a larger sample should be retained.

### **4.5. Record**

All information relevant to the sampling shall be recorded, in particular:

- a) date of sampling;
- b) name of the product;
- c) type of admixture;
- d) name of the manufacturer;
- e) manufacturer's batch
- f) identification number;
- g) quantity of batch represented;
- h) by the sample;
- i) physical state;
- j) colour;
- k) names of persons present and organizations represented during sampling.



## **5. Assessment and verification of consistency of performance — AVCP**

### **5.1. General**

The compliance of admixtures for concrete, mortar and grout with the requirements of the relevant parts of the series KS 2770 and with the performances declared by the manufacturer in the Declaration of performance (DoP) shall be demonstrated by:

- determination of the product type;
- factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

### **5.2. Conformity criteria**

Composition and performance requirements and the related checks and test methods are given in the relevant parts of the series KS 2770. When tested in accordance with these methods each result shall conform to the relevant requirement.

### **5.3. Type testing**

Type testing shall be carried out to prove the conformity of the admixtures to the requirements of the relevant part of the series KS 2770, in the following circumstances:

- a) when a new formulation or type of admixture is produced;
- b) when there is a change in formulation which may have significant effect on the performance of the admixture or which affects the manufacturer's stated values for the product as listed under general requirements in the relevant part of the KS 2770 series;
- c) when there is a change in the raw materials which may have a significant effect on the performance of the admixture or which affects the manufacturer's stated values for the product as listed under general requirements in the relevant part of the KS 2770 series.

Type testing shall include all tests for a specific type of admixture as detailed in the relevant part of the KS 2770 series. This shall include the number of samples to be tested, all compliance characteristics, the assessment method and requirements.

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same test method, under the AVCP system 2+ on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

The results of the determination of the type testing shall be documented in test reports. All test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the admixture for concrete, mortar and grout to which the test relates.

### **5.4. Factory production control (FPC)**

#### **5.4.1. General**

The manufacturer shall document, operate and maintain production control at each factory where admixtures are produced. Production control shall include control of raw materials, production

processes and the finished product. The production control procedures shall be contained in a production control manual for each factory.

The frequency and requirements for demonstrating constancy of performance are given in tables within the series KS 2770-2 to KS 2770-5.

#### 5.4.2. Production control manuals

Each production control manual shall specify the procedures to ensure that admixtures supplied from each factory conform to the requirements of KS 2770-2 to KS 2770-5. As a minimum, the following items shall be included:

- a) training for production and quality control operatives including the level of training necessary;
- b) procedures for the identification, sampling, approval against specification, traceability, storage and expiry dates of raw materials;
- c) procedures for servicing and calibrating all manufacturing and test equipment (see Annex A);
- d) manufacturing and sampling instructions;
- e) procedures for FPC testing at the frequency required by the relevant parts of the KS 2770 series;
- f) details of FPC acceptance limits for each characteristic required by the relevant parts of the KS 2770 series, linked to the manufacturer's **Stated Values** for the current **Type Testing** documentation and **Declaration of Performance**;
- g) action to be taken in case of non compliance of raw materials, intermediate and finished products including full traceability and retesting, and procedures to investigate and eliminate the causes of non compliance;
- h) instructions for packaging, labelling, storage and delivery of finished products;
- i) procedures to ensure that only admixtures which conform to the relevant part of the KS 2770 series of standards are labelled as complying;
- j) records to be prepared and period for which they shall be retained (5.4.3).

Individual responsibilities shall be defined in the production control manual. Each responsible person shall report to a senior manager who has the authority to ensure that the procedures in the production control manual are fully implemented. Where appropriate, the production control manuals shall be supplemented by additional documented instructions relating to the items listed above.

#### 5.4.3. Production control records

The following details shall be recorded clearly and in chronological order:

- a) results of checks on measuring equipment used in production and testing, including calibration reports;
- b) raw materials identification and test results;
- c) production data (type and marking of the admixture, batch identification number, quantity produced, date of production and any production code);
- d) sampling in accordance with Clause 4;
- e) date and results of production control tests and checks, comparison with requirements and, where appropriate, action taken;



- f) signature of the responsible person.  
These records shall be stored for at least 10 years.

**5.4.4. Initial inspection of factory and FPC**

Initial inspection of factory and of FPC shall be carried out when the production process has been finalized and is in operation. The factory and FPC documentation shall be assessed to verify that the requirements of this standard are fulfilled. During the inspection it shall be verified:

- a) that all resources necessary for the achievement of the product characteristics included in this European Standard are in place and correctly implemented,
- b) that the FPC- procedures in accordance with the FPC documentation are followed in practice,
- c) that the product complies with the product type samples, for which compliance of the product performance to the DoP has been verified.

**5.4.5. Continuous surveillance of FPC**

Surveillance of the FPC shall be undertaken once per year. The surveillance of the FPC shall include a review of the FPC test plan(s) and production processes(s) for each type of admixture to determine if any changes have been made since the last assessment or surveillance. The significance of any changes shall be assessed.

Checks shall be made to ensure that the test plans are still correctly implemented and that the production equipment is still correctly maintained and calibrated at appropriate time intervals.

The records of tests and measurement made during the production process and to finished products shall be reviewed to ensure that the values obtained still correspond with those values for the samples submitted to the determination of the product type and that the correct actions have been taken for non- compliant products.

**5.4.6. Procedure for modifications**

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance, which may be affected by the modification, shall be subject to the determination of the product type, as described in 5.3.

Where relevant, re-assessment of the factory and the FPC system shall be performed for those aspects which may be affected by the modification.

All assessments and their results shall be documented in a report.