

KS 574:2017

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Steel fabric for reinforcement of concrete — Specification

KENYA BUREAU OF STANDARDS (KEBS)

Head Office: P.O. Box 54974, Nairobi-00200, Tel.: (+254 020) 605490, 602350, Fax: (+254 020) 604031 E-Mail: info@kebs.org, Web:http://www.kebs.org

Coast Region	
P.O. Box 9937	'6, Mombasa-80100
Tel.: (+254 04	1) 229563, 230939/40

Fax: (+254 041) 229448

Lake Region

P.O. Box 2949, Kisumu-40100 Tel.: (+254 057) 23549, 22396 Fax: (+254 057) 21814 Rift Valley Region P.O. Box 2138, Nakuru-20100 Tel.: (+254 051) 210553, 210555

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Foreword

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

Steel fabric is widely used in the country in the reinforcement of concrete, and there exists a great potential for its development and use. This standard lays down the specifications of such fabrics and emphasis was laid on the metrication of the meshes.

This fourth edition of KS 574 has incorporated more reference meshes and width measurements to broaden its scope. Additional illustrations were also included during the revision of this standard.

This fourth edition of KS 574:2015 cancels and replaces the third edition of KS 574:2014, Steel fabric for reinforcement of concrete — Specification.

During the preparation of this standard, reference was made to the following documents:

BS 4483:2005: Specification for steel fabric for the reinforcement of concrete.

IS 1566:1967 Hard drawn steel wire fabric for concrete reinforcement.

MS 145:2001, Specification for steel welded fabric for the reinforcement of concrete (second revision).

KS 574:2014, Steel fabric for reinforcement of concrete — Specification.

Acknowledgement is hereby made for the assistance derived from these sources.

KENYA STANDARD

Steel fabric for reinforcement of concrete — Specification

1 Scope

This Kenya Standard covers the requirements for hard-drawn steel wire fabric for the reinforcement of concrete consisting of hard-drawn wire with cross wires welded to them.

2 Normative references

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

KS 105, Specification for hard drawn steel wire for reinforcement of concrete

3 Definitions

3.1

dimensions

dimensions of sections shall be in accordance with the tables of this standard

3.2

welded fabric

arrangement of longitudinal and transverse bars of the same or different nominal diameter and length that are substantially perpendicular to each other and welded together at all points of intersection

3.3

longitudinal bar

reinforcing steel in the manufacturing direction of the welded fabric

3.4

transverse bar

reinforcing steel perpendicular to the manufacturing direction of the welded fabric

3.5

length of a welded fabric sheet

longest side of a sheet of welded fabric, irrespective of the manufacturing direction

3.6

width of a welded fabric sheet

shortest side of a sheet of welded fabric, irrespective of the manufacturing direction

3.7

elongation

the increase in length of a tensile test piece under stress

3.8

mesh size

the pitch or centre to centre distance of line and cross wires e.g. 100 mm x 200 mm all be taken to mean rods or bars

4 Types

Hard-drawn steel wire fabric shall be of the following four types:

- i) square mesh;
- ii) structural fabric;
- iii) long mesh;
- iv) wrapping fabric.

5 Designations and description for ordering purposes

When ordering fabric to this standard, the purchaser shall give the following requirements in the same sequence:

- i) the reference number of fabric; and
- ii) the number and size of sheets or rolls.

6 Quality of steel

All fabric shall be manufactured from hard-drawn steel wire in accordance with KS 02-105.

7 Manufacture and design

7.1 Structure

The fabric shall be formed by spacing the main and the cross wires, which shall be fixed at points of intersection by fusion electric welding or interweaving, so as to be sufficiently stable to withstand normal handling while in transit and during concreting, without displacement.

7.2 Joints

Butt joints in the wires of the fabric shall be electrically welded and the joints shall be staggered.

8 Condition of finished fabric

All fabric reinforcement shall be delivered free from loose mill scale, loose rust, oil and grease and other extraneous matter likely to affect the bond with concrete adversely. The sheet or roll shall not contain any broken wires, and the number of broken cross-welded joints shall not exceed 4 % of the total number of cross welded joints, nor exceed half the cross-welded joint along any one wire

9 Dimensions and mass

9.1 Dimensions

The preferred mesh sizes, wire sizes and mass per square metre shall be as given in Tables 2, 3, 4 and 5.

9.2 Calculation of mass

The nominal mass of fabric shall be calculated on the basis that a metre length of steel weighs 0.00785 kg/mm^2 ..

10 Tolerances

10.1 Mesh size

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The number of spaces between the external wires in sheet or roll shall be determined by the nominal pitch. The centre distance between two adjacent wires shall not vary by more than 5 % or 10mm whichever is lower from the nominal pitch. All sides of sheets or rolls shall have overhang on the meshes equal to one half the pitch.

10.2 Deviations

When the fabric is to be cut to specified dimensions, the tolerance shall be as specified in Table 1.

10.3 Mass of fabric

The tolerance on the mass of the fabric shall be + 6 % and – 4 %.

10.4 Drawn wire

The tolerance on the nominal diameter shall be +2 per cent and -1.0 per cent for all sizes.

10.5 Standard mesh sizes

The standard mesh sizes, wire sizes and mass per square metre shall be as specified in Tables 2, 3, 4 and 5.

Table 1 — Deviations on dimensions of sheet and roll

Dimensions	Deviations
Up to and including 5 m	25 mm under or over the specified dimension.
Over 5 m	0.5 % under or over the specified dimension



Figure 1 — Typical square mesh fabric

Mesh ref	Mes (No pitch (1	Mesh size Wire sizes (Nominal (mm) pitch of wires) (mm)		Cross- a per me (n	sectional trea ter width nm²)	Nominal mass per square metre (kg)	
A1006	200	200	16	16	1006	1006	15.79
A566	200	200	12	12	566	566	8.88
A 393	200	200	10	10	393	393	6.16
A318	200	200	9	9	318	318	4.99
A 252	200	200	8	8	252	252	3.95
A 193	200	200	7	7	193	193	3.03
A 142	200	200	6	6	142	142	2.22
A 98	200	200	5	5	98	98	1.54
A 65	180	180	4	4	70	70	1.11
A 66	180	180	3	3	39	39	0.62
A 610	180	180	2.5	2.5	27	27	0.43

Table 2 — Typical square mesh fabric



Figure 2 — Typical structural mesh

Mesh ref	Mesh size (nominal pitch of wires) (mm)		Wire siz	es (mm)	Cross-se per me	ectional area etre width mm²)	Nominal mass per square metre (kg)
	Main	Cross	Main	Cross	Main	Cross	
B 503	100	200	8	8	503	252	5.93
B 385	100	200	7	7	385	193	4.53
B 283	100	200	6	7	283	193	3.75
B 196	100	200	5	7	196	193	3.05

Table 3 — Structural mesh fabric





Table 4 — Long mesh fabric

Mesh ref	Mesł (Nor pitch o (m	n size ninal f wires) m)	Wire sizes (mm)		Cross-sectional area per meter width (mm ²)		Nominal mass per square metre (kg)
	main	cross	main	cross	main	cross	
C 785	100	400	10	6	785	70.8	6.72
C 503	100	400	8	5	503	49.0	4.34
C 385	100	400	7	5	385	49.0	3.41
C 283	100	400	6	5	283	49.0	2.61





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Mesh ref	Mesh (Non pitch o (m	n size ninal f wires) m)	Wire (m	Wire sizes (mm)		ectional ea er width m ²)	Nominal mass per square metre (kg)
	main	cross	main	cross	main	cross	
D 98	200	200	5	5	98.0	98.0	1.54
D 49	100	100	2.5	2.5	49.1	49.0	0.77

10.6 Standard sheet and roll sizes

The sheet and roll sizes of fabrics shall be as specified in Table 6.

Table 6 — Sheet and roll sizes								
Length		Width of sheet or roll						
Sheet of 4.2 m	2.1m or 2.4m							
Roll of 24m and 48m	2.1m or 2.4m							

10.7 Measurement of length/width of sheet or roll

The length/width of sheet or roll shall be measured from the tops of the overhangs.

11 Strength of weld

The manufacturers shall certify that where the inter-sections are welded when tested in accordance with Clause 12, all such welds shall be capable of withstanding a load in a shear of not less than one quarter of that necessary to develop the load, calculated from the specified characteristic proof stress in tension, of the smaller intersecting wires. This certification shall not be invalidated by broken welds provided they are within the limits specified in Clause 7.

12 Tests

Test pieces for tensions and bend tests shall be so cut, from the fabric that each tensile test piece shall contain one or more cross welds in its length.

12.1 Tensile test

12.1.1 Tensile tests shall be made on the mesh after fabrication across one or more welds to the requirements specified in ISO 6892-1: 2016

12.1.2 One tensile test shall be made for every 6 000m² of fabric.

12.2 Bend test

12.2.1 The bend test shall be made on the test pieces cut from the longitudinal wire as well as the transverse wire, between the welds. The test piece shall not be annealed or subjected to any heat or treatment before testing. The test piece shall withstand one complete cycle of reverse bend around pin of size as indicated in Table 7, without showing any signs of fracture when reverse bend test is carried out in accordance with 12.2.3.

	Diameter of pin
7 mm and under	Equal to diameter of specimen
Over 7 mm	Equal to twice the diameter of specimen

Table 7 — Bend test

12.2.2 One reverse bend test shall be carried out for every 6 000 m of fabric.

12.2.3 The method of reverse bend test shall be such that one end of the test sample shall be firmly gripped

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in a vice and the free end shall be bent round a pin of diameter as in 12.2.1 above, through an angle of 90° and bent back in the opposite direction round the same radius through an angle of 180°, thereafter being bent back again to the original position without fracture.

12.3 Retest

Should a tensile test piece break outside the middle half of the gauge length, the test may be discarded and another test made on a piece cut from the same length of wire. In all other cases, should any of the test pieces first selected not fulfill the required test, two additional tests pieces in respect of each failure may be taken. Should both the additional test pieces pass the test, the material shall be deemed to comply with this standard. Should either of them fail to fulfill such tests, the material represented shall be rejected. The additional test shall be carried out in the same manner in all respects as the tests previously carried out.

13 Shear test

13.1 Test pieces

The test specimens for the shear test shall be cut from the fabric so that each specimen conforms to Figure 5.





13.2 Test method

The test specimen shall be firmly gripped in the test device shown in Figure 6 in such a manner that the pulled bar is loaded centrally and rotation of the anchoring bar prevented as far as possible. The upper free end of the pulled bar shall be so supported (e.g. by means of rollers) that the measured shear force is not increased by friction forces. The rate of loading shall not exceed 10 N (mm².s).



KEY

- 1 Pulled bar
- 2 Anchoring bar
- 3 Extension for grips of testing machine
- 4 Clamp for anchoring bar
- 5 Rest for anchoring bar
- 6 Support to prevent bending of pulled bar
- 7 Low-friction sliding surface or roller bearing

Figure 6 — Device for performing shear test

14 Defects revealed after delivery

Should any or all material after delivery be found not to be in accordance with this specification, such material shall be deemed not to comply with this Kenya Standard. However, notwithstanding any previous acceptance, material delivered which does not comply with this standard due to poor bending, chemical exposure, heating, etc, while on transit or on site shall not be caused for manufacturer's liability.

NOTE Damage to the ribs can be avoided by the use of an aluminium sheet insert placed between the specimen and the former.

15 Marking

When the material is delivered in bundles, the manufacturers shall attach a label bearing the following:

- i) manufacturer's name or trade mark;
- ii) mesh reference number;
- iii) width of roll;
- iv) length of roll; and
- v) wire diameter.
- vi) actual weight of the roll

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