INTERNATIONAL STANDARD

ISO 4602

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Reinforcements — Woven fabrics — Determination of number of yarns per unit length of warp and weft

Renforts — Tissus — Détermination du compte de fils de chaîne et de duites par unité de longueur

Reference number
ISO 4602:1997(E)

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4602 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 13, *Composites and reinforcement fibres*.

This second edition cancels and replaces the first edition (ISO 4602:1978), which has been technically revised.

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Reinforcements – Woven fabrics – Determination of number of yarns per unit length of warp and weft

1 SCOPE

This International Standard specifies a method of determining the number of yarns per unit length of warp and weft of woven textile reinforcement fabrics made of glass, carbon, aramid or any other reinforcement fibre.

2 PRINCIPLE

The number of yarns in the warp and in the weft are counted over a given distance using a suitable yarn-counting device.

3 APPARATUS

3.1 Rule, graduated in millimetres.

3.2 Yarn-counting device: any suitable magnifying device ranging from a counting glass (see figure 1) to a traversing microscope.

3.3 Suitable needle, if required, for separating the yarns.

4 TEST SPECIMEN

4.1 Measurements shall be taken on areas free from creases or deformation.

4.2 The measurements may be taken as follows:

- either on the entire fabric;
- or on a strip of fabric at least 600 mm wide taken from the entire width of the fabric.

5 PROCEDURE

5.1 Determine the distance over which the measurements are to be made, taking care that the distance chosen will enable at least 50 yarns to be counted and that the distance is not less than 10 mm and not more than 100 mm.

For routine control purposes, the count may be limited to those yarns that are visible within the window of a counting glass, without taking any account of the number of yarns counted. In this case, this fact shall be mentioned in the test report, giving the size of the window of the counting glass used.

5.2 Lay the fabric smoothly and without tension on a horizontal surface.

5.3 Do not make measurements closer than 50 mm to the edges or selvedges of the fabric.

5.4 Place the calibrated rule (3.1) or yarn-counting device (3.2) on the fabric so that the zero (or any suitable reference point) is coincident with the right-hand edge of a warp yarn.

Count the number of entire yarns lying within the distance determined in 5.1. If necessary, use the needle (3.3) to separate the yarns which have been counted from the yarns which have still to be counted.

Record the number of entire yarns and the exact distance from the initial reference point to the right-hand edge of the last yarn to be counted.

5.5 Consider this as one measurement. Move the counting glass or counting device to another position so that none of the yarns in the previous measurement is included, and repeat the above procedure four times. Repeat the same procedure for the weft direction.

6 EXPRESSION OF RESULTS

6.1 Calculate, for each of the five measurements in each case, the number of warp and weft yarns per 10 mm of fabric, using the equation

$$N_i = \frac{n_i \times 10}{a_i}$$

where

N_i is the number of yarns per 10 mm of fabric;

n_i is the number of yarns counted;

a_i is the exact distance, in millimetres, over which the measurement was made.

6.2 Calculate the average number of warp yarns and the average number of weft yarns per unit length as the arithmetic mean of the five measurements taken in each direction.

6.3 Report the number of warp and weft yarns per unit length as the number of yarns per 10 mm, expressed to one decimal place.

7 PRECISION

The precision of this method is not known because interlaboratory data are not available. When interlaboratory data are obtained, a precision statement will be added at the following revision of the standard.

8 TEST REPORT

The test report shall include the following particulars:

a) a reference to this International Standard;

b) all details necessary for complete identification of the fabric measured;

c) the size of the window of the counting glass used (if applicable);

d) the distance over which the measurements were made;

e) the individual values and the average values of the number of yarns per unit length of warp and weft, respectively;

f) details of any operations not specified in this International Standard, as well as any incidents which might have affected the results.

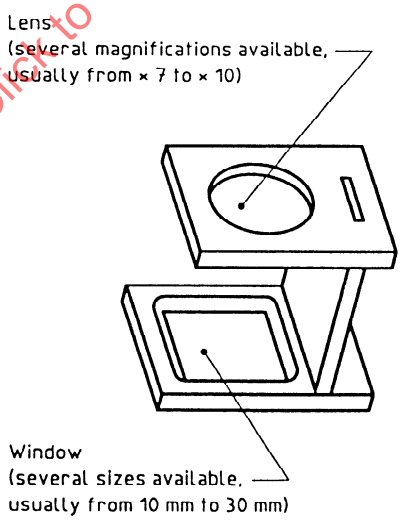

Figure 1 – Example of a counting glass

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