



BSI Standards Publication

Textile glass chopped-strand mats for reinforcement of plastics — Determination of time of dissolution of the binder in styrene

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National foreword

This British Standard is the UK implementation of ISO 2558:2010.

The UK participation in its preparation was entrusted to Technical Committee PRI/42, Fibre reinforced thermosetting plastics and prepregs.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Textile glass chopped-strand mats for reinforcement of plastics — Determination of time of dissolution of the binder in styrene

*Mats de verre textile à fils coupés pour renforcement des matières
plastiques — Détermination du temps de dissolution du liant dans le
styrène*



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ISO 2558 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 2558:1974), of which it constitutes a minor revision (in 6.1, the minimum distance from the edge of the mat at which test specimens may be cut out has been increased to 30 mm and, in 6.2, a requirement has been added to condition not only the specimens but also the styrene before the test).

Textile glass chopped-strand mats for reinforcement of plastics — Determination of time of dissolution of the binder in styrene

1 Scope

This International Standard specifies a method of determining the time taken for a tensile load to break the bond between the strands of a textile glass chopped-strand mat, used for the reinforcement of plastics, which is immersed in styrene.

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.

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

3 Principle

A test specimen is suspended vertically in pure styrene and a tensile load applied by means of a weight attached to the lower end of the specimen. The time taken for the weight to fall a specified distance is recorded.

NOTE It is possible to distinguish better between mats having binders which are highly soluble in styrene by using a stabilized emulsion of styrene in water (see 5.2), although this can only be done if the binder is completely insoluble in water.

4 Apparatus

4.1 Template, for cutting out test specimens measuring 125 mm × 100 mm.

4.2 Trimming tool, for example a knife, a pair of scissors or a disc.

4.3 Beaker, minimum capacity 2 000 ml and minimum depth 195 mm.

4.4 Circular sieve, made of stainless steel, to fit the beaker (an example is shown in Figure 1), with suspension arms long enough to ensure a distance of 50 mm between the lower clamp and the sieve. This sieve is used to remove the lower clamp and the disintegrated strands from the beaker at the end of the test.

4.5 Pair of clamps, made of stainless steel, suitable for gripping test specimens over their whole width. The lower clamp shall have a total mass of 100 g ± 2 g and shall be balanced. An example of a suitable pair of clamps is shown in Figure 2.

4.6 Stop-watch, accurate to 1 s.

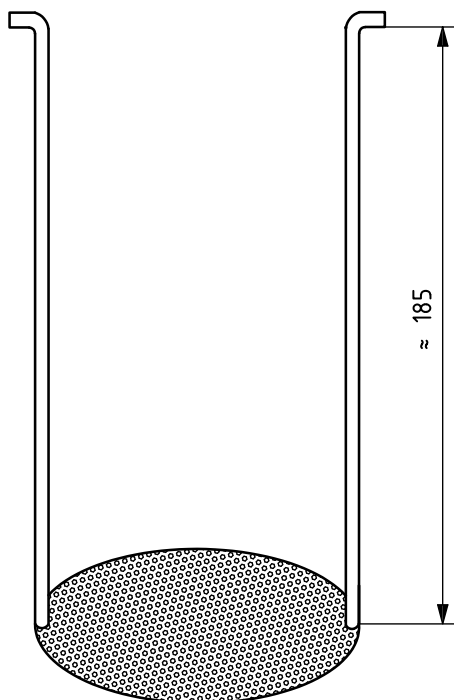
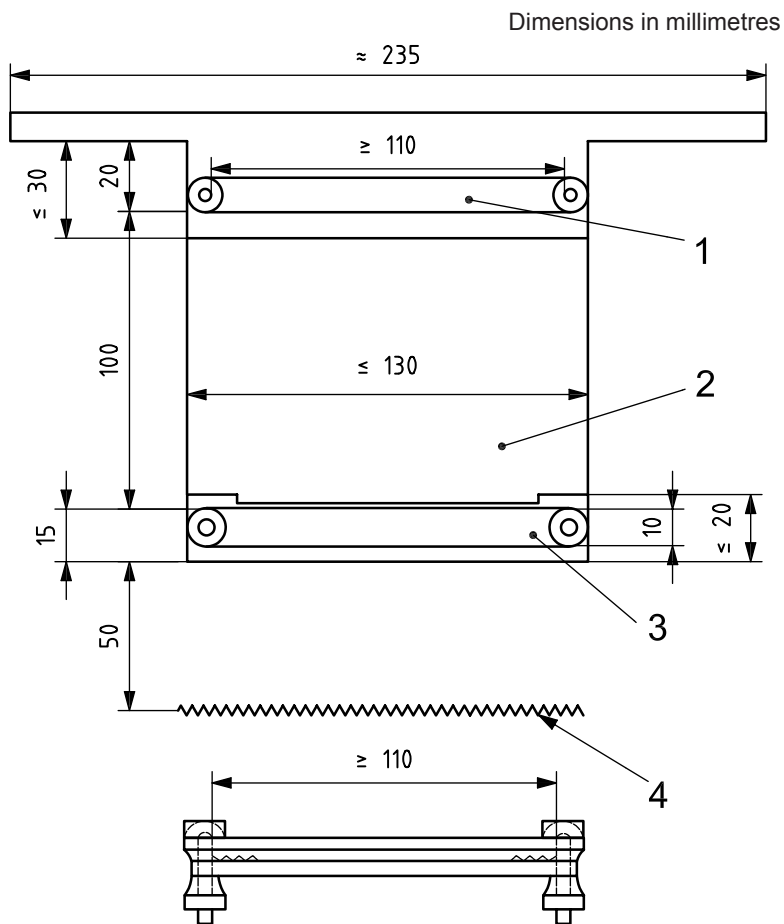


Figure 1 — Sieve



Key

- 1 upper clamp 2 test specimen 3 lower clamp 4 sieve

Figure 2 — Example of a suitable apparatus

5 Solvent

5.1 Styrene monomer, $d_{20} = 0,907$.

Two litres of styrene allows 150 test specimens to be tested.

5.2 Stabilized emulsion of styrene in water, with a styrene concentration chosen from the following: 80 %, 60 %, 40 %, 20 %. Such emulsions can be prepared by the addition of a suitable emulsifying agent.

6 Test specimens

6.1 Selection

Use at least five test specimens obtained as follows:

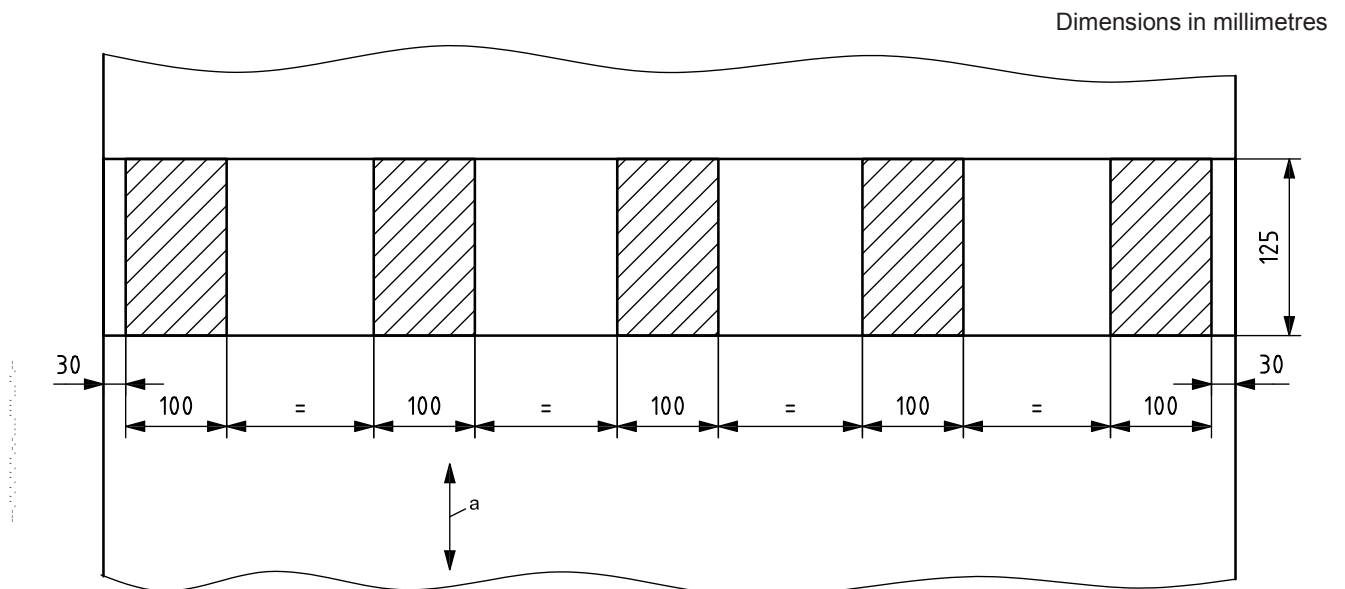
Cut a strip measuring at least 125 mm in the roll length direction from the whole width of the mat (see Figure 3). Using the template and trimming tool, cut from the strip:

- one 100 mm × 125 mm test specimen at each end of the strip, but not nearer than 30 mm to the edges in the case of mats with trimmed edges and with a suitable extra allowance in the case of untrimmed mats

plus

- at least three 100 mm × 125 mm test specimens evenly distributed over the remaining width,

in such a way that the length of the test specimens is parallel with the roll length direction, as shown in Figure 3.



^a Roll length direction.

Figure 3 — Cutting out test specimens

6.2 Conditioning

Condition the test specimens and styrene (or styrene emulsion) before the test for 1 h at the chosen test temperature (see Clause 7).

7 Procedure

Carry out the test at one of the temperatures specified in ISO 291, recording the chosen temperature in the test report. Ensure that not only the styrene (or styrene emulsion), but also the beaker, sieve and clamps, are at this temperature.

It is recommended that a suitable ventilating system capable of dealing with styrene vapours be used.

Fix the clamps to the ends of the test specimen in such a way as to leave a free area of dimensions 100 mm × 100 mm between the clamps.

Place the sieve (4.4) in the beaker (4.3) partly filled with styrene (5.1) or styrene emulsion (5.2). Immerse the lower clamp and test specimen in the styrene (or styrene emulsion) in the beaker and ensure that the styrene (or styrene emulsion) reaches the level of the upper clamp. The distance between the bottom of the lower clamp and the sieve at this moment shall be 50 mm.

Start the stop-watch when the upper clamp touches the rim of the beaker.

Stop the stop-watch when the lower clamp touches the sieve. Discontinue the test if the break has not occurred within 10 min.

Record the time t_i , in seconds, indicated by the stop-watch.

Repeat the test for the remaining specimens.

8 Expression of results

The time of dissolution of the binder of the chopped-strand mat under test is the arithmetic mean, in seconds (rounded to the nearest second), of the times, t_i , noted for all the specimens tested.

9 Test report

The test report shall include the following particulars:

- a) the reference number of this International Standard;
- b) all details necessary to identify the mat tested;
- c) the test temperature;
- d) the concentration of the styrene emulsion (if used);
- e) the individual values of the time of dissolution of the binder and their arithmetic mean;
- f) details of any operations not specified in this International Standard;
- g) details of any incidents which might have influenced the results;
- h) the date of the test.

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