

Specification for

E glass fibre rovings for reinforcement of polyester and epoxy resin systems

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- British Plastics Federation
- British Telecommunications plc
- ERA Technology Ltd.
- Electrical and Electronic Insulation Association (BEAMA Ltd.)
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- Ministry of Defence
- Process Plant Association
- Royal Institute of British Architects
- Society of British Aerospace Companies Ltd.
- Society of Motor Manufacturers and Traders Ltd.
- Standards Association of Australia (British Committees)

The following body was also represented in the drafting of the standard, through subcommittees and panels:

Imperial College of Science and Technology

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Foreword

This British Standard has been prepared under the direction of the Plastics Standards Policy Committee and supersedes BS 3691:1969, which is withdrawn. It covers the use of glass fibre rovings bonded with polyester and epoxy resins. In this revision the opportunity has been taken, where appropriate, to incorporate notation and definitions from ISO 6355, published by the International Organization for Standardization (ISO).

The requirement for the conductivity of water extract, specified previously to ensure that A glass was not supplied in place of E glass by error, has been omitted since this requirement has become obsolete. In the preparation of test rods, the selection of the resin has been made less restrictive to allow the use of resins normally encountered in the industry, providing that the cross breaking strengths of test rods comply with the specified limits. Polyester resin systems are now required to comply with BS 3532. A method for measuring mean filament diameter has been incorporated and a designation system has been introduced. The selected grade is now characterized by tighter tolerances on tex and loss on ignition.

Two types of rovings are specified, indirect and direct rovings, both available as “normal” or “selected” grades. Depending upon the nature of the size system, both types of roving may be used in conjunction with polyester and epoxy resin systems or either type may be used solely with either system alone. In addition, the requirement to test at specified frequencies that was included in the previous edition has been omitted (see Appendix A).

Attention is drawn to the fact that the rovings specified in this British Standard may be further processed by being chopped, e.g. in spray-up or preforming processes, or without being chopped, e.g. when weaving or filament winding, etc. It is therefore recommended that the intended use of the rovings be fully discussed with the supplier when ordering, so that the proper designation may be given.

NOTE Unless the contrary is stated by the supplier, it may be presumed that the minimum storage life of the glass fibre rovings is one year when stored in accordance with the manufacturer's instructions.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies requirements for E glass fibre rovings intended for the reinforcement of polyester and epoxy resin systems, including vinyl and bisphenyl polyesters.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply.

2.1

coupling agent

a substance that promotes or establishes a stronger bond at the interface of the resin matrix and the reinforcement

2.2

direct roving

roving obtained by winding a large and determined number of filaments directly from a bushing

2.3

E glass

a glass containing not more than 1% by mass of alkali (calculated as Na_2O) and used for the manufacture of glass fibres

2.4

filament

a single textile element of a small diameter and a very long length, considered as continuous

2.5

indirect roving

a collection of parallel strands assembled without intentional twist

NOTE This is sometimes referred to as an “assembled roving”.

2.6

mean filament diameter

the average diameter of 100 filaments, determined in accordance with Appendix B

2.7

size

material applied to glass fibres or filaments during the course of their manufacture

NOTE The size may contain a coupling agent.

2.8

strand

an assembly of parallel filaments simultaneously produced and slightly bonded, without intentional twist

2.9

tex

the mass in grams per kilometre length of roving

3 Designation

NOTE 1 This clause is in accordance with ISO 2078.

Rovings shall be designated by a code that consists of the following elements in the order given:

- a) the letter “E”, to describe the glass composition type used by the manufacturer;
- b) the letter “C”, to describe the use of “continuous fibre”;
- c) a whole number of one or two digits to describe the filament diameter in micrometres (see Table 1);
- d) either of the following as appropriate:
 - 1) for direct roving, a number to describe the total roving linear density (in tex); or
 - 2) for indirect roving, a number to describe the linear density of the individual strands that compose the roving (in tex);
- e) for indirect roving only, a multiplication sign “x”;
- f) for indirect roving only, the number of strands assembled without intentional twist;
- g) the number and date of this British Standard, i.e. BS 3691:1990.

Example 1. An E glass roving manufactured using continuous fibre directly from strands of measured mean filament diameter 17 μm to a linear density of 2 400 tex is designated “EC 17 2400: BS 3691:1990”.

Example 2. An E glass roving manufactured using continuous fibre and manufactured indirectly by combining 44 individual rovings each of linear density 55 tex and of strand of measured mean filament diameter 12 μm is designated “EC 12 55 x 44: BS 3691:1990”.

NOTE 2 For ordering purposes the designation should be followed by the following elements:

- a) the type of roving, i.e. normal or selected;
- b) details of the type(s) of resin system(s) with which the roving is required to be compatible;
- c) the type and size of package and dimensions of the supporting cardboard tube required, if any.