

# SVENSK STANDARD

## SS-ISO 18319:2016



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### **Fiberkompositarmering (FRP) för betong: Specifikationer för FRP-väv (ISO 18319:2015, IDT)**

### **Fibre-reinforced polymer (FRP) reinforcement for concrete structures – Specifications of FRP sheets (ISO 18319:2015, IDT)**

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Den internationella standarden ISO 18319:2015 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 18319:2015.

The International Standard ISO 18319:2015 has the status of a Swedish Standard. This document contains the official English version of ISO 18319:2015.

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Denna standard är framtagen av kommittén för Betongkonstruktioner, SIS/TK 556.

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 6, *Non-traditional reinforcing materials for concrete structures*.

# Fibre-reinforced polymer (FRP) reinforcement for concrete structures — Specifications of FRP sheets

## 1 Scope

This International Standard specifies requirements for fibre-reinforced polymer (FRP) sheets for upgrading of concrete members. The methodologies to express the mechanical properties as characteristic values, appearance and dimensions, and sampling test are specified in this International Standard. The properties for design are calculated from the characteristic values, as prescribed in an appropriate design code which is in accordance with ISO 14484. The fibre orientation of the FRP sheets covered by this International Standard is unidirectional.

## 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.

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

ISO 10406-2, *Fibre-reinforced polymer (FRP) reinforcement of concrete — Test methods — Part 2: FRP sheets*

ISO 5725, *Accuracy (trueness and precision) of measurement methods and results*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10406-2 and the following apply.

### 3.1

#### **dry sheet**

fibres in sheet form including sizing agent and weft, before application of the saturating resin matrix

### 3.2

#### **sizing agent**

any material applied to fibres to facilitate the handling and use of the fibres

Note 1 to entry: 'Sizing agent' is synonymous with 'size' which is described in ISO 10548.

### 3.3

#### **weft**

thread to shape bundles in sheet form

## 4 Symbols

See [Table 1](#).

**Table 1 — Symbols**

Symbol	Unit	Description	Reference
$t$	mm	nominal thickness	<a href="#">6.2.2</a>
$\rho_s$	g/m <sup>2</sup>	fibre mass per unit area	<a href="#">6.2.2</a>
$\rho_{sh}$	g/cm <sup>3</sup>	density	<a href="#">6.2.2</a>

## 5 Mechanical properties

### 5.1 General

The mechanical properties of FRP sheet shall be expressed by the characteristic values of tensile strength, Young's modulus, and ultimate strain. The tests shall be conducted in accordance with [Clause 6](#).

### 5.2 Characteristic value of tensile strength

Characteristic value of tensile strength shall be determined by subtracting three times the standard deviation from the mean strength. The definitions of the standard deviation and mean strength are provided in ISO 10406-2.

### 5.3 Characteristic value of Young's modulus

Characteristic value of Young's modulus shall be the mean value, the definition of which is provided in ISO 10406-2.

### 5.4 Characteristic value of ultimate strain

Characteristic value of ultimate strain shall be determined by the characteristic value of tensile strength divided by the characteristic value of Young's modulus.

## 6 Appearance and dimensions

### 6.1 Appearance

The dry sheet shall have a smooth surface without folds and/or remarkable waves by visual inspection. There shall be no remarkable breakage of fibres through whole bundles.

### 6.2 Dimensions

#### 6.2.1 Length and width

The length and width of the dry sheet shall be agreed upon between interested parties.