

This document is a review generated by EVS

Fibre-reinforced plastic composites - Shear test method using a shear frame for the determination of the in-plane shear stress/shear strain response and shear modulus (ISO 20337:2018)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 20337:2019 sisaldb Euroopa standardi EN ISO 20337:2019 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 20337:2019 consists of the English text of the European standard EN ISO 20337:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 09.10.2019.	Date of Availability of the European standard is 09.10.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 83.120

Standardite reproduutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 20337

October 2019

ICS 83.120

English Version

Fibre-reinforced plastic composites - Shear test method
using a shear frame for the determination of the in-plane
shear stress/shear strain response and shear modulus
(ISO 20337:2018)

Composites plastiques renforcés de fibres - Méthode
d'essai de cisaillement à l'aide d'un châssis de
cisaillement pour la détermination de la contrainte de
cisaillement /déformation au cisaillement dans le plan
et du module de cisaillement (ISO 20337:2018)

Faserverstärkte Kunststoffe - Schubversuch mittels
Schubrahmen zur Ermittlung der Schubspannungs-
/Schubverformungskurve und des Schubmoduls in der
Lagenebene (ISO 20337:2018)

This European Standard was approved by CEN on 23 September 2019.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of ISO 20337:2018 has been prepared by Technical Committee 61 "Plastics" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 20337:2019 by Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2020, and conflicting national standards shall be withdrawn at the latest by April 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 20337:2018 has been approved by CEN as EN ISO 20337:2019 without any modification.

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	2
5 Test apparatus	3
5.1 Tensile test machine	3
5.1.1 General	3
5.1.2 Test speeds	3
5.1.3 Force indicator	3
5.2 Shear frame	3
5.3 Strain measurement	5
5.4 Micrometer	6
6 Test specimens	6
6.1 Shape and dimensions	6
6.2 Preparation of test specimens	7
6.3 Inspection of the test specimens	8
6.4 Number of test specimens	8
6.5 Conditioning of test specimens	8
7 Procedure	8
7.1 Test atmosphere	8
7.2 Determination of the test specimen thickness	8
7.3 Test speed	8
7.4 Data collection	8
7.5 Test termination	8
7.6 Failure mode	9
8 Calculation and expression of results	10
9 Test report	10
Bibliography	12

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).

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The test method described in this document uses a shear frame fixture in order to introduce a pure shear loading throughout the free area of the test specimens. The edges of the test specimens are uniformly clamped during the test procedure avoiding fibre rotation and load re-distribution effects. This allows for the ultimate shear strength of high shear-elongation materials to be obtained even at shear strains higher than 5 % which is a limitation when using ISO 14129 or other standards regarding in-plane shear test methods for fibre reinforced plastic composites.

Fibre-reinforced plastic composites — Shear test method using a shear frame for the determination of the in-plane shear stress/shear strain response and shear modulus

1 Scope

This document specifies a method using a shear test apparatus for measuring the in-plane shear stress/shear strain response, shear modulus and shear strength of continuous-fibre-reinforced plastic composite materials with fibre orientations of 0° and 0°/90°.

This method is applicable to thermoset and thermoplastic matrix laminates made from unidirectional layers/non-woven fabrics and/or fabrics including unidirectional fabrics, with the fibres oriented at 0° and 0°/90° to the specimen axis, where the lay-up is symmetrical and balanced about the specimen mid-plane.

The method is suitable for determining shear properties in both the linear and nonlinear load-deformation range even at shear strains greater than 5 %.

Short and long fibre-reinforced plastic composites can also be tested using this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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*

ISO 1268 (all parts), *Fibre-reinforced plastics — Methods of producing test plates*

ISO 2818, *Plastics — Preparation of test specimens by machining*

ISO 2602, *Statistical interpretation of test results — Estimation of the mean — Confidence interval*

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

ISO 12781-1, *Geometrical product specifications (GPS) — Flatness — Part 1: Vocabulary and parameters of flatness*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

plane

plane spanned by coordinate axes 1 and 2

Note 1 to entry: See [Figure 2](#).