

BS ISO 12817:2013



BSI Standards Publication

Fibre-reinforced plastic composites — Determination of open-hole compression strength

bsi.

...making excellence a habit.
AVA Documents™
Document Sharing Hub

National foreword

This British Standard is the UK implementation of ISO 12817:2013.

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

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013.
Published by BSI Standards Limited 2013.

ISBN 978 0 580 66126 6

ICS 83.120

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2013.

Amendments issued since publication

Date	Text affected
------	---------------

INTERNATIONAL STANDARD

BS ISO 12817:2013

ISO
12817

First edition
2013-03-15

Fibre-reinforced plastic composites — Determination of open-hole compression strength

*Composites plastiques renforcés de fibres — Détermination de la
résistance à la compression avec trou nu*



Reference number
ISO 12817:2013(E)
Documents
Document Sharing Hub
© ISO 2013



COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Principle	2
5 Apparatus	3
6 Test specimens	9
6.1 Shape and dimensions	9
6.2 Alternative specimen	9
6.3 Preparation of test plates and specimens	11
6.4 Inspection of test specimens	11
6.5 Number of test specimens	11
7 Conditioning	12
8 Procedure	12
8.1 Test atmosphere	12
8.2 Measurement of dimensions of the test specimens	12
8.3 Mounting of the test specimens	12
8.4 Test speed	12
8.5 Preliminary loading	12
8.6 Recording	12
8.7 Failure mode	13
9 Calculation	13
9.1 Open-hole compressive strength	13
9.2 Expression of results	14
10 Precision	14
11 Test report	16
Bibliography	17

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 12817 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 13, *Composites and reinforcement fibres*.

Introduction

In preparing this (harmonized) International Standard, reference has been made to other similar open-hole compression methods (JIS K 7093,^[1] ASTM D6484/D6484M-09^[2]) and related methods, i.e. open-hole tension in ASTM D5766/D5766M6^[3] and pin-bearing in ISO 12815.^[4]

The scope covers all current and future fibre-reinforced plastic composites meeting the requirements of this International Standard. This International Standard incorporates three methods that have different suitability and do not necessarily yield identical properties. All the methods use the maximum load to define the open-hole compressive strength.

Fibre-reinforced plastic composites — Determination of open-hole compression strength

1 Scope

This International Standard specifies the test method to determine the open-hole compressive strength of laminated fibre-reinforced plastic composites. The laminate is intended to be a balanced and symmetrical lay-up or be otherwise homogeneous through the thickness. This International Standard applies to all textile diameter fibre types (carbon, glass, aramids, etc.) and matrices (e.g. thermoset, thermoplastic) that meet the requirements of this International Standard.

This International Standard includes three methods:

- method 1 (short specimen with support fixture);
- method 2 (short specimen without support fixture);
- method 3 (long specimen with support fixture as in ASTM D6484/D6484M-09, methods A and B).

Method 1 employs an L-shaped base fixture and two end fixtures. These end fixtures are compressed between the platens of the test machine.

Method 2 employs end supports similar to the fixtures given in C.1 of ISO 14126:1999. Method 2 is useful for cyclic loading conditions test, including under fully or partly reversed loading conditions when the specimen is clamped by hydraulic grips without support fixtures

Method 3 has two types of loading methods, i.e. 3A and 3B. In method 3A, the specimen is placed within a stabilization fixture, which is then clamped by hydraulic grips. In method 3B, the specimen is placed within a stabilization fixture and then end-loaded by platens. Full details of test methods 3A and 3B are given in ASTM D6484/D6484M-09, procedure A and procedure B, respectively.

NOTE Specimen configurations and force introduction varies for the three methods covered within this International Standard. Results obtained using methods 1, 2 and 3 might not be equivalent for all laminates in all environments.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable to 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 472, *Plastics — Vocabulary*

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

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

ISO 5893, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Specification*

ISO 14126:1999, *Fibre-reinforced plastic composites — Determination of compressive properties in the in-plane direction*