

Fibre-reinforced plastic composites — Determination of compressive properties in the in-plane direction

The European Standard EN ISO 14126:1999 has the status of a
British Standard

ICS 83.120

National foreword

This British Standard is the English language version of EN ISO 14126:1999, including corrigendum July 2002. It is identical with ISO 14126:1999, including Technical Corrigendum July 2001.

The UK participation in its preparation was entrusted to Technical Committee PRI/42, Fibre reinforced thermosetting plastics and prepregs, which has the responsibility to:

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- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

Cross-references

Attention is drawn to the fact that CEN and CENELEC Standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement these international or European publications may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, the EN ISO foreword page, the ISO title page, page ii to iv, pages 1 to 20, an inside back cover and a back cover.

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English version

**Fibre-reinforced plastic composites —
Determination of compressive properties in the
in-plane direction**

(ISO 14126:1999)

Composites plastiques renforcés de fibres —
Détermination des caractéristiques en compression
dans le plan
(ISO 14126:1999)

Faserverstärkte Kunststoffe —
Bestimmung der Druckeigenschaften in der
Laminebene
(ISO 14126:1999)

This European Standard was approved by CEN on 8 August 1999.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

The text of the International Standard ISO 14126:1999 has been prepared by Technical Committee ISO/TC 61 “Plastics” in collaboration with Technical Committee CEN/TC 249 “Plastics”, the Secretariat of which is held by IBN.

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 March 2000, and conflicting national standards shall be withdrawn at the latest by March 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 14126:1999 was approved by CEN as a European Standard without any modification.

NOTE Normative references to International Standards are listed in Annex ZA (normative).

Endorsement notice

The text of ISO 14126:1999/Cor. 1:2001 has been approved by CEN as a European Corrigendum without any modifications.

INTERNATIONAL STANDARD

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Fibre-reinforced plastic composites — Determination of compressive properties in the in-plane direction

*Composites plastiques renforcés de fibres — Détermination des
caractéristiques en compression dans le plan*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

International Standard ISO 14126 was prepared by ISO/TC 61, *Plastics*, Subcommittee SC 13, *Composites and reinforcement fibres*.

This first edition cancels and replaces ISO 8515:1991, which dealt only with glass-fibre-reinforced plastic composites.

Annex A forms a normative part of this International Standard. Annex B to Annex D are for information only.

Introduction

This standard is based on ISO 8515, with the scope extended to include all fibre-reinforced plastic composites, such as more recent composites based on carbon and aramid fibres, but retains the test conditions relevant for glass-fibre-reinforced systems. Other source documents consulted include ASTM D 3410 (buckling criteria, larger specimen width and longer gauge length), ASTM D 695 (modified version in SACMA SRM1), prEN2850, CRAG 400, DIN 65380 and JIS K 7076 (see bibliography).

Several different types of jig, different materials and different specimen sizes are covered by these source documents. The table below presents examples, the specimen sizes being given as overall length $\times$ gauge length $\times$ width $\times$ thickness, in millimetres.

ISO 8515 (GRP)	Celanese type $110 \times 13 \times 6,4 \times 2$	End block $120 \times 20 \times 10 \times (3 \text{ to } 10)$	
prEN 2850 (CFRP)	Celanese type $110 \times 10 \times 10 \times 2$	ASTM D 695 $80 \times 5 \times 12,5 \times 2$	Revision includes a machined specimen with co-cured tabs.
JIS K 7076 (CFRP)	ASTM D 695 $78 \times 8 \times 12,5 \times 2$	Celanese $134 \times 8 \times 6,5 \times 2$	ITTRI $108 \times 8 \times (6 \text{ to } 12,5) \times (1 \text{ to } 2)$
ASTM D 3410 (all fibres)	Celanese $140 \times 12 \times 6 \times \text{variable}$	ITTRI $140 \times (25 \text{ to } 12) \times (12 \text{ or } 25) \times \text{variable}$	(equations/tables give required thickness for modulus, expected strength and gauge length)
DIN 65380 (all fibres)	Celanese $112 \times 8 \times 6,35 \times 2$	ITTRI $112 \times 8 \times 6,35 \times 2$	
CRAG 400 (all fibres)	Celanese $110 \times 10 \times 10 \times 2$		
SACMA SRM1 (all fibres)	ASTM D 695 (modified) $80,8 \times 12,7 \times 4,8 \times [1 \text{ (unidir.) or } 3 \text{ (fabric)}]$		

These test methods use aspect ratios (height/thickness and height/width) for the gauge area covering a range of values, which appears undesirable in a test known to be susceptible to buckling failures. Also, new support jigs are still being developed. This International Standard harmonizes and rationalizes the current situation by:

- concentrating on the quality of the test by limiting the maximum bending-buckling strain allowable at failure (i.e. 10 % as recommended by ASTM — see also 5 % level in prEN 2850), so that it is possible to justify an axial-load analysis;
- allowing any design of jig to be used that meets this above requirement, using two methods of loading (i.e. shear and end loaded);
- standardizing on two specimen designs, one principally for unidirectional material and one for other materials (the chosen specimen can be used with either loading method);
- adding an informative note as Annex D, which was proposed by ASTM for harmonization purposes, and is taken from ASTM D 3410 (in a modified form).