

BS 4978:2007+A2:2017



BSI Standards Publication

Visual strength grading of softwood — Specification



Publishing and copyright information

The BSI copyright notice displayed in this document indicates when the document was last issued.

© The British Standards Institution 2017

Published by BSI Standards Limited 2017

ISBN 978 0 580 97589 9

ICS 79.040

The following BSI references relate to the work on this document:

Committee reference B/518

Drafts for comment 06/30148361 DC; 11/30238046 DC; 17/30356462 DC

Amendments/corrigenda issued since publication

Date	Text affected
31 December 2011	A1: see foreword
31 October 2017	A2: see foreword

Contents

	Page
Foreword	ii
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Strength graded timber	2
<i>Figure 1 — Edge, face and margin areas</i>	3
5 Grade requirements	4
6 Measurement of characteristics	4
<i>Figure 2 — Knot projection</i>	5
<i>Figure 3 — Typical knot area ratios and the resulting grades</i>	7
<i>Figure 4 — Measurement of rate of growth</i>	8
<i>Figure 5 — Amounts of wane</i>	9
<i>Figure 6 — Measurement of bow, spring and twist</i>	9
<i>Table 1 Permissible limits for the GS and SS visual strength grades</i>	10
7 Marking	11
<i>Figure 7 Example of a mark on visually strength graded softwood</i>	11
Annex A (normative) Determination of the knot area ratio in cases of dispute	12
Annex B (normative) The control and supervision of visual strength grading operations	12
Bibliography	14

Summary of pages

This document comprises a front cover, and inside front cover, pages i to ii, pages 1 to 14, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard was published by BSI and came into effect on 31 May 2007. It was prepared by Technical Committee B/518, *Structural timber*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

BS 4978:2007+A1:2011 superseded BS 4978:2007, which has been withdrawn.

BS 4978:2007+A2:2017 supersedes BS 4978:2007+A1:2011, and has been updated to be brought into line with the requirements of BS EN 14081: 2016.

This edition of this British Standard has been revised to conform to the requirements of BS EN 14081-1.

Information about this document

The start and finish of text introduced or altered by Amendments No 1 and No 2 is indicated in the text by tags **A1** **A1** and **A2** **A2**. Minor editorial changes are not tagged.

This British Standard provides the means of assessing the quality and strength capabilities of softwood for which characteristic values as strength classes are given in BS EN 338. The assignments of species/grade combinations to those strength classes is given in BS EN 1912, which incorporates the grades defined in this British Standard.

In this British Standard [Annex A](#) specifies the method to be used for the determination of knot area ratio in cases of dispute, and [Annex B](#) specifies the minimum requirements for the control of strength grading operations.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

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

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

1 Scope

This British Standard specifies a **A2** methodology for the visual strength grading of softwood **A2** for structural use.

The permissible limits of characteristics **A2** are specified for two visual strength grades of softwood:

- GS – General Structural; and
- SS – Special Structural. **A2**

A1 Text deleted **A1**

2 Normative references

The following referenced documents are indispensable for the application 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.

A2 Text deleted **A2**

A1 Text deleted **A1**

BS EN 336, *Structural timber — Sizes, permitted deviations*

A1 Text deleted **A1**

BS EN 1310:1997, *Round and sawn timber — Method of measurement of features*¹⁾

BS EN 1912, *Structural timber — Strength classes — Assignment of visual grades and species*

A1 BS EN 1995-1-1, *Eurocode 5: Design of timber structures – Part 1-1: General — Common rules and rules for buildings* **A1**

BS EN 13183-2, *Moisture content of a piece of sawn timber — Part 2: Estimation by electrical resistance method*

BS EN 13556, *Round and sawn timber — Nomenclature of timbers used in Europe*

BS EN 14081-1, *Timber structures — Strength graded structural timber with rectangular cross section — Part 1: General requirements*

A1 BS EN 14250, *Timber structures — Product requirements for prefabricated structural members assembled with punched metal plate fasteners* **A1**

3 Terms and definitions

For the purposes of this British Standard, the nomenclature given in BS EN 13556 and the terms and definitions given in **A2** Text deleted **A2** BS EN 14081-1, BS EN 336 **A1** Text deleted **A1** and the following apply.

3.1 dry graded timber

A2 timber which has been dried before strength grading is completed **A2**

3.2 fissure

longitudinal separation of fibres, appearing on a face, edge or end of a piece of softwood, and including checks, shakes and splits

¹⁾ **A2** To be withdrawn and superseded by BS EN 1309-3 (in preparation) in 2018. **A2**

3.3 knot area ratio

ratio of the sum of projected cross-sectional areas of the knots to the cross-sectional area of the piece

3.4 margin

area adjoining an edge of the cross-section, occupying one-quarter of the total cross-sectional area of the piece (see [Figure 1](#))

3.5 margin knot area ratio (MKAR)

ratio of the sum of the projected cross-sectional areas of all knots or portions of knots in a margin intersected at any cross-section, to the cross-sectional area of margin

3.6 parcel

quantity of sawn timber of the same target size, quality and description

3.7 sample

number of specimens of one cross-sectional size and from one parcel

3.8 strength class

classification of timber based on particular values of mechanical properties and density

3.9 total knot area ratio (TKAR)

ratio of the sum of the total projected cross-sectional areas of all knots intersected by any cross-section to the total cross-sectional area of the piece (see [Figure 2](#))

3.10 wet graded timber

$\boxed{A_2}$ timber which has not been dried before grading and which might subsequently, as it dries, display varying degrees of fissures and distortion $\langle A_2 \rangle$

4 Strength graded timber**4.1 Supervision of strength grading operations**

Visual strength grading operations shall be carried out by a grader and/or grading company, in accordance with [Annex B](#) and with factory production control requirements in BS EN 14081-1.

NOTE Softwood which is graded abroad under the supervision of an EU Notified Body and marked in accordance with this British Standard does not have to be re-graded in the United Kingdom, $\boxed{A_1}$ unless [4.4](#) applies $\langle A_1 \rangle$.

4.2 Sizes

Unless $\boxed{A_2}$ specified otherwise, softwood graded in accordance with this British Standard $\langle A_2 \rangle$ shall conform to BS EN 336 with respect to permissible $\boxed{A_2}$ processing deviations $\langle A_2 \rangle$ applicable to constructional timber. Timber shall have a minimum cross-sectional area of 2 000 mm² and a minimum thickness of 20 mm.

4.3 Processing of $\boxed{A_2}$ timber after grading $\langle A_2 \rangle$

$\boxed{A_1}$ Visually $\boxed{A_2}$ strength graded softwood shall no longer conform to this British Standard if any reduction in size after it has been graded $\langle A_2 \rangle$ is greater than:

- a) 5 mm for dimensions less than or equal to 100 mm; or
- b) 10 mm for dimensions greater than 100 mm.