INTERNATIONAL STANDARD

ISO 10033-2

First edition
2011-04-15

Laminated Veneer Lumber (LVL) — Bonding quality —

Part 2: Requirements

Lamibois — Qualité du collage —

Partie 2: Exigences

Reference number
ISO 10033-2:2011(E)

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

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 10033-2 was prepared by Technical Committee ISO/TC 89, *Wood-based panels*, Subcommittee SC 3, *Plywood*.

ISO 10033 consists of the following parts, under the general title *Laminated Veneer Lumber (LVL) — Bonding quality*:

— *Part 1: Test methods*

— *Part 2: Requirements*

Laminated Veneer Lumber (LVL) — Bonding quality —

Part 2:
Requirements

1 Scope

This part of ISO 10033 specifies requirements for determining the bonding quality class of Laminated Veneer Lumber (LVL) bonded with thermosetting resins, according to their intended end uses.

NOTE Appropriate test methods are specified in ISO 10033-1.

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.

ISO 10033-1, *Laminated Veneer Lumber (LVL) — Bonding quality — Part 1: Test methods*

ISO 12466-2, *Plywood — Bonding quality — Part 2: Requirements*

ISO 18776, *Laminated veneer lumber (LVL) — Specifications*

3 Bonding classes

Bonding quality is categorized into three classes in accordance with ISO 18776, based upon moisture resistance as follows.

3.1 Class 1 — Dry conditions

This bonding class is appropriate for laminated veneer lumber (LVL) intended for use in normal interior climates in which the LVL attains an equilibrium moisture content not exceeding 12 % except for only a few weeks a year, e.g. ambient temperature of 20 °C and relative humidity of 65 %.

3.2 Class 2 — Tropical dry/humid conditions

This bonding class is appropriate for LVL intended for use in protected external applications, e.g. roof beams or external wall studs, but capable of resisting weather exposure for short periods, e.g. when exposed during construction. It is suitable for interior situations where the service moisture condition is higher than the class 1 level. The bonding class is appropriate for conditions in which the LVL attains an equilibrium moisture content not exceeding 18 % except only for a few weeks a year, e.g. ambient temperature of 30 °C and relative humidity of 85 %.

3.3 Class 3 — High humid/exterior conditions

This bonding class is designed for conditions leading to higher equilibrium moisture content than specified for tropical dry/humid conditions or prolonged exposure to weather.

4 Requirements

4.1 General

For each bonding quality, after the appropriate pre-treatments specified in Table 1 of this part of ISO 10033 and the procedures specified in ISO 10033-1, the ratio of delamination (%) shall be determined for both each single glueline and the total length of all gluelines.

A minimum of two test pieces per sample shall satisfy the requirements specified in this clause.

For class 2 and class 3, where two pre-treatments are required, each pre-treatment shall be carried out on a separate set of two test pieces.

4.2 Pre-treatment

Table 1 — Pre-treatment requirements

Bonding class	Pre-treatment						
	Basic			Additional			
	24 h Cold soak (ISO 10033-1, 5.1.1)	VP (vacuum pressure) (ISO 10033-1, 5.1.4)	Hot water soak (ISO 10033-1, 5.1.7)	6 h Boil (ISO 10033-1, 5.1.2)	BDB (boil-dry-boil) (ISO 10033-1, 5.1.3)	72 h Boil (ISO 10033-1, 5.1.5)	Steam (ISO 10033-1, 5.1.6)
1	X	X	X	—	—	—	—
2	X	X	—	X	X	X	X
3	X	X	—	—	X	X	x

One of the indicated basic pre-treatments shall be chosen, plus one of the indicated additional pre-treatments for bonding class 2 and bonding class 3.

For full phenolic adhesives, when VP is used as the basic pre-treatment, an additional pre-treatment only needs to be occasionally conducted for validation purposes.

4.3 Glueline requirements

For all three bonding classes each test specimen shall satisfy each of the following two criteria.

— Ratio of delamination (%) in each separate individual glueline shall not exceed 25.

— Ratio of delamination (%) for the total length of all gluelines shall not exceed 5.

NOTE Any failure in the wood is not considered to be delamination.

If ISO 10033-1, Annex A (shear test) is used for each bonding class, each glueline tested shall satisfy the glueline requirements of ISO 12466-2.