Contents

Foreword ................................................................. iv

Introduction .......................................................... v

1 Scope .......................................................................... 1

2 Normative references ............................................. 1

3 Terms and definitions .............................................. 1

4 Abbreviated terms .................................................. 2

5 Measurement of natural frequencies and modal damping ratios ......................................................... 2
   5.1 General .................................................................. 2
   5.2 Apparatus ............................................................... 3
   5.3 Test procedures .................................................... 4
      5.3.1 General requirements and principles .................. 4
      5.3.2 Shaker test procedure .................................... 5
      5.3.3 Impact test procedure .................................... 7
   5.4 Modal analysis .................................................... 9

6 Measurement of static deflection under a concentrated load ............................................................... 9
   6.1 General ................................................................. 9
   6.2 Apparatus ............................................................... 10
   6.3 Test procedure ..................................................... 11

7 Environmental condition of test site ................................................................. 11

8 Test report ............................................................... 12

Bibliography ............................................................. 13
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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 165, Timber structures.
Dynamic properties of timber structures are of critical importance to designers since they govern how these structures respond to seismic, wind and in-service human-induced dynamic excitation. Seismic and wind can cause structural failure, while in-service human-induced motion generally causes serviceability problems related to human discomfort; this is also true to wind-induced building motion. Since occupants are constantly in contact with the floor system, vibration serviceability of floor systems is often of concern to designers of timber structures. Vibrational performance of a timber floor can be assessed using parameters such as natural frequencies, damping ratios, dynamic responses to an impulse (dynamic displacement, velocity, and acceleration), and static deflection under a concentrated load. These parameters have been found to correlate well with human perceptions. Among these parameters, natural frequencies, damping ratios, and static deflection under concentrated load are commonly used to evaluate timber floor vibrational performance. Design procedures have been developed, and in some cases implemented in design standards, for assessing vibration serviceability of timber floors. These design procedures usually include criteria for floor response parameters, such as those listed above, and mathematical procedures to calculate these parameters. As an alternative to calculation, it is also necessary to provide standardized procedures to measure these parameters experimentally. This is the prime motive for the development of this ISO test standard.

Natural frequencies and damping ratios of a test system can be measured using modal testing. ISO published a series of International Standards on the application of modal testing and analysis to determine natural frequencies, modal damping ratios, and other dynamic properties of an object. The theory of modal testing and analysis has been well documented in Reference.[4] This International Standard provides practical procedures that can be applied either in the laboratory or in the field to measure natural frequencies, modal damping ratios and static deflection under a concentrated load of a timber floor. It is assumed that users of the International Standard have the necessary equipment and fundamental knowledge to perform modal testing.

This International Standard does not address acceptance criteria for vibrational serviceability.