Katsemeetodid kaubaaluste sõlmedele. Osa 1: Kaubaaluste naelte, teiste kinnitusdetailide ja kobade paindetugevuse määramine

Methods of test for pallet joints - Part 1: Determination of bending resistance of pallet nails, other dowel-type fasteners and staples

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 12777-1:2000 sisaldab Euroopa standardi EN ISO 12777-1:1996 ingliskeelset teksti. Käesolev dokument on jõustatud 11.01.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 12777-1:2000 consists of the English text of the European standard EN ISO 12777-1:1996. This document is endorsed on 11.01.2000 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: Käesolev standard kirjeldab testimismeetodeid kaubaaluste naelte, kobade ja teiste kinnitusdetailide paindetugevuse määramiseks. See sisaldab katseid: (a) staatiline paindetugevus (3- ja 4-punkti koormusmeetodid); (b) löökpaindetugevus (3-punkti koormusmeetod). Antud katsetusmeetodid on rakendatavad igat tüüpi kuni 6 mm läbimõõduga naeltele (ümar-, ruut-, rihvel-, keerd-, sile- ja keermesnaelad) ning võivad olla ka sobivad teistele kinnitusdetailidele, näiteks kobadele.	**Scope:**

ICS 55.180.20

Võtmesõnad: kaubaalused, kinnitusdetailid, kobad, naelad (kinnitusdetailid), paindeteimid, testimine, ühendamine

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English version

Methods of test for pallet joints

Part 1: Determination of bending resistance of pallet nails, other dowel-type fasteners and staples

(ISO 12777-1:1994)

Méthodes d'essai des assemblages de palettes – Partie 1: Détermination de la résistance à la flexion des clous et autres éléments de fixation de type cheville, et des clous cavaliers (ISO 12777-1:1994)

Prüfungen von Verbindungen an Paletten – Teil 1: Bestimmung der Biegefestigkeit von Palettennägeln, Klammern und anderen dübelartigen Verbindungselementen (ISO 12777-1:1994)

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CEN

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Foreword

International Standard

ISO 12777-1:1994 Methods of test for pallet joints – Determination of bending resistance of pallet nails, other dowel-type fasteners and staples,

which was prepared by ISO/TC 51 'Pallets for unit load method of materials handling' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 261 'Packaging' as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by February 1997 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, 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 12777-1:1994 was approved by CEN as a European Standard without any modification.

Introduction

In 1988 ISO/TC 51 requested ISO/TC 51/WG 2 to develop standard test methods for pallet joints. During the early meetings of WG 2 it became evident that the lack of International Standards on nail testing meant that fasteners (essential elements of pallet joints) could not be characterized sufficiently to enable worthwhile progress on full-joint testing. Although there were existing, or partially developed, nail testing principles, WG 2 considered that, in a practical situation where for quality control purposes or comparisons of nail quality reasonably accurate and rapid nail strength data were required, one, or both, of the two existing commercial nail testers was (were) better suited to the needs of pallet makers, pallet test laboratories and nail manufacturers.

Preliminary work by WG 2 led the manufacturers of both machines to make design modifications to improve accuracy. In November 1990, WG 2 appointed an *ad hoc* team of four members to evaluate the machines. The evaluation, carried out with the cooperation of the manufacturers/agents of each nail test machine, demonstrated that the technical requirements for nail test machines/principles were met by both machines.

The good correlation between the ultimate tensile strength of steel and the results of nail bending tests disappears once threads are rolled on to nails. Nail bending resistance is critical to the performance of a nail and, for this reason, the bending resistance of finished nails is the recommended method for specifying pallet nails and staples.

Users should not automatically specify the highest grade of nail in a pallet design, any more than they would automatically specify the strongest available wood species. In general, it is only to improve the performance of a particular joint that is proving a weak link in a pallet design, or to build in a longer life, etc., that nail upgrading would take place. There are also many instances where a nail with a lower performance would be the best choice, such as in a pallet-mat subassembly constructed with clinched nails.

1 Scope

This part of ISO 12777 describes test methods for the determination of the bending resistance of pallet nails, staples and other dowel-type fasteners.

It includes tests for the

a) ultimate strength in static bending (three- and four-point loading methods);

b) impact bend resistance (three-point loading method).

These test methods apply to all types of nails, including loose, collated or coil nails, up to 6 mm in diameter (round, square, fluted, twisted, plain or threaded) and may also be suitable for other fasteners such as staples.

2 Definition

For the purposes of this part of ISO 12777, the following definition applies.

2.1 bending resistance

(1) (primary static method): The ultimate strength determined in bending configuration using a three- or four-point loading method. It is measured as torque in newton metres.

(2) (supplementary impact method): The impact bend resistance under the application of a given load. It is measured in degrees as an angle of deformation.

3 Symbols

F	Applied force, in newtons
F_R	Force of reaction, in newtons
I	Impact load (impulse), in newton seconds
M	Applied torque, in newton metres
M_R	Opposing torque, in newton metres
l	Nail or staple length, in millimetres, under bending stress (dimension B to C in figures 1 and 3)
L	Effective length, in millimetres, of load actuator
α	Angular movement, in degrees
β	Angle of deformation, in degrees

4 Static bend tests (primary methods)

4.1 Three-point loading method

4.1.1 Principle

A nail, staple or other dowel-type fastener is clamped in such a way as to resist bending at two points A and B (see figure 1). A force is then applied to the unclamped portion of the nail at a set point C, using a pivoted bending actuator to which torque is applied. The maximum torque applied is recorded.