SLOVENSKI STANDARD
SIST EN 14294:2005

01-marec-2005

Lepila za usnjene in obutvene materiale - Izdelava lepljenih preskušancev s postopki direktnega podplatenja

Adhesives for leather and footwear materials - Preparation of bonded test pieces by moulding-on processes

Klebstoffe für Leder und Schuhwerkstoffe - Herstellung von Verbund-Proben nach dem Anformverfahren

Adhésifs pour cuir et matériaux de la chaussure - Préparation d'éprouvettes collées par moulage direct sur tige

Ta slovenski standard je istoveten z: **EN 14294:2004**

ICS:

61.060	Obuvala	Footwear
83.180	Lepila	Adhesives

SIST EN 14294:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14294

September 2004

ICS

English version

Adhesives for leather and footwear materials - Preparation of bonded test pieces by moulding-on processes

Adhésifs pour cuir et matériaux de la chaussure - Préparation d'éprouvettes collées par moulage direct sur tige

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Ref. No. EN 14294:2004: E

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Foreword

This document (EN 14294:2004) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

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

Introduction

Documents EN 522, EN 1391 and EN 1392 specify methods of testing and evaluation of adhesives for leather and footwear materials in ‘stuck-on’ assemblies. Most footwear produced in Europe is manufactured using stuck-on processes, but a significant proportion is produced by ‘moulding-on’ processes such as vulcanising, injection moulding and reaction moulding.

This document specifies the preparation of bonded test pieces by moulding-on processes. The form and dimensions of the test pieces produced allows testing according to the test methods specified in EN 1392, and evaluation of the bond strength obtained according to EN 522 or EN 1391.

This document therefore complements the above mentioned series of documents, and together they allow the simulation, testing and evaluation of almost all bonds occurring in common footwear constructions.

1 Scope

This document specifies procedures for the preparation of test pieces comprising adhesive coated leather or other footwear upper material onto which a soling material is moulded directly. The procedures described simulate direct vulcanising of rubber, injection moulding of thermoplastics and reaction moulding of polyurethane.

The prepared test pieces are suitable for the test procedures described in EN 1392, to meet the requirements of EN 522 and EN 1391.

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.

EN 923, *Adhesives - Terms and definitions*

EN 1392, *Adhesives for leather and footwear materials - Solvent-based and dispersion adhesives - Test methods for measuring the bond strength under specified conditions*

EN ISO 868, *Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923 and EN 1392 and the following apply:

3.1
moulding-on process
process for soling footwear in which the soling material is directly moulded onto the bottom of the shoe in a mould closed by the shoe upper or other footwear component.

NOTE The other footwear component can be an outsole or midsole onto which another soling layer is to be moulded.

3.2
vulcanising
moulding process in which uncured rubber is inserted or extruded into the mould and is shaped and crosslinked by heat and pressure.

3.3
injection moulding
moulding process in which molten thermoplastic material is injected into the mould and sets on cooling.

3.4
reaction moulding
moulding process in which reactive chemicals are poured or injected into the mould and polymerise and crosslink by chemical reaction.

4 Principle

The surface of the leather, other footwear upper material or other footwear component material used is treated in a manner specific to the nature of the material. Strips of specified length and width are cut from the treated material.

One or more of these strips are coated with adhesive and attached, with the bonding surface uppermost, to the bottom plate of a mould. Soling material is introduced to fill the mould and allowed to cure or set as appropriate to produce an assembly of soling bonded to upper material.

The moulded assembly, and test pieces cut from it, are stored under specified conditions before testing.

5 Safety

Persons using this document shall be familiar with normal laboratory practice.

This document does not purport to address all the safety problems, if any, associated with its use.

It is the responsibility of the user to establish safety and health practices and to ensure compliance with any European or national regulatory conditions.

6 Adhesives and materials

6.1 Footwear adhesives

The adhesive used shall be identified in the report, in particular note name and/or designation, manufacturer, date of manufacture or supply and/or lot number, main polymer and colour. For two-part adhesives the nature of the crosslinking agent and the mixing ratio of the components shall be identified.

Reference footwear test adhesives are one or two-part adhesives with specified properties (e.g. Test adhesive CR 1, Test adhesive CR 2, Test adhesive PU 1, Test adhesive PU 2). If a reference footwear test adhesive in accordance with EN 1391 is used, record its designation in the report.

NOTE For direct vulcanising processes, and injection moulding processes with styrene-butadiene-styrene thermoplastic rubber (SBSR), special types of adhesive are required.

6.2 Footwear materials

6.2.1 General

Identify all footwear materials used in the report.

6.2.2 Upper materials (or other footwear materials)

Record the name and/or designation, manufacturer, date of manufacture or supply and type of leather, other footwear upper material (or other footwear material) used. For leathers list colour, thickness and type of tannage (if known). If reference test Leather 1 is used in accordance with EN 522, record its designation.

6.2.3 Soling moulding materials

6.2.3.1 General

The soling moulding material required depends on the moulding-on process to be simulated.

6.2.3.2 Direct vulcanising materials

Record the name and/or designation, manufacturer, date of manufacture or supply, colour, polymer base and Shore hardness in accordance with EN ISO 868 of the material used.

NOTE Uncured compounds of acrylonitrile-butadiene (nitrile) rubber (NBR) or styrene-butadiene rubber (SBR) are mainly used.

6.2.3.3 Injection moulding materials

Record the name and/or designation, manufacturer, date of manufacture or supply, colour, polymer base and Shore hardness in accordance with EN ISO 868 of the material used.

NOTE PVC compounds or styrene-butadiene-styrene thermoplastic rubber (SBSR) compounds are mainly used.

6.2.3.4 Reaction moulding materials

Record the name and/or designation, manufacturer, date of manufacture or supply, colour, chemical nature of the reactive constituents and the catalysts used, if any.

NOTE Polyurethane chemicals are mainly used, consisting of a prepolymer and a resin which are mixed in the appropriate proportions before moulding. If a catalyst is also required, this can be added to the resin prior to the weighing out of the constituents.

7 Apparatus

7.1 General

The items required depend on the types of material used and the type of moulding-on process.

7.2 Cutting knife, sharp for cutting test pieces in accordance with 8.1. The angle between the inner and outer cutting surface shall be approximately 20°.

7.3 Adhesive applicator, brush, roller or coating machine for applying a uniform coat of the adhesive under test.

7.4 Platen press, a heated platen press suitable for direct vulcanisation of rubber, capable of:

— maintaining platen temperatures of (105 ± 5) °C for the bottom platen and (180 ± 5) °C for the top platen.

— applying a pressure up to 5 MPa to the mould.

7.5 Rectangular mould, of approximate dimensions 150 mm x 100 mm x 5 mm for direct vulcanisation. The wall of the mould base should include a 10 mm wide shelf all round, half way up, to accept excess rubber displaced from the cavity.

7.6 Surface pyrometer, suitable for measuring the operating temperatures of the press platens.

7.7 Oven, capable of maintaining a temperature of (75 ± 10) °C to pre-heat the rubber prior to moulding.

7.8 Gloves, heat resistant, suitable for handling the hot mould.

7.9 Injection moulding machine, fitted with a mould of approximate dimensions 150 mm x 100 mm x 5 mm for the preparation of flat test plaques. A commercial single station low pressure screw injection moulder is suitable.

7.10 Mould, for polyurethane reaction moulding, having: