ISO/~~DIS~~ FDIS 12808:2023(E)

ISO/TC 136

Secretariat: UNI

~~Date: 2023-11~~

Hardware for furniture — Strength and durability of extension elements and their components

First edition

Date: 2023-12-06

Contents

Foreword

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This document was prepared by Technical Committee ISO/TC 136, *Furniture*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The aim of this document is to provide furniture manufacturers, designers and developers with comparable information regarding the performance of extension elements and drawers.

The tests consist of the application of loads, forces and velocities simulating normal functional use, as well as misuse, that ~~might~~can reasonably be expected to occur.

With the exception of the corrosion test in 6.4, the tests are designed to evaluate properties without regard to materials, design/construction or manufacturing processes.

The strength and durability tests only relate to the extension elements and the parts used for the attachment, e.g. screws.

The strength and durability tests are carried out in a test frame with specified properties. The test results can only be used as a guide to the performance of a piece of furniture.

The test results are only valid for the extension element tested. These results ~~may~~can be used to represent the performance of production models provided that the tested model is representative of the production model.

Hardware for furniture — Strength and durability of extension elements and their components

1 Scope

This document specifies test methods and requirements for the strength and durability of all types of extension elements and their components for all fields of application, except table extensions.

With the exception of corrosion, ageing and the influence of heat and humidity are not ~~included~~covered in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 6270–2, *Paints and varnishes — Determination of resistance to humidity — Part 2: Condensation (in-cabinet exposure with heated water reservoir)*

ISO 9427, *Wood-based panels — Determination of density*

ISO 10289, *Methods for corrosion testing of metallic and other inorganic coatings on metallic substrates — Rating of test specimens and manufactured articles subjected to corrosion tests*

EN 320, *Particleboards and fibreboards — Determination of resistance to axial withdrawal of screws*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
catch device
device which keeps or pulls an *extension element* (3.2) in place, but does not require a second action in order to release it

EXAMPLE A magnetic catch or a self-closing or self-opening mechanism.

3.2
extension element
component that can be pulled out and pushed in

EXAMPLE Drawers, suspended pocket files, keyboard trays.

3.3
loading capacity
total mass
M
mass ~~in kg~~, as specified by the manufacturer, for which the *extension element* (3.2) fulfils the strength and durability requirements

Note 1 to entry: The load capacity is expressed in kg.

Note 2 to entry: The loading capacity includes the extension element and the load in/on the extension element.

3.4
damper
mechanism which gently brings the *extension element* (3.2) to a stop

4 Test conditions

4.1 General

The extension element shall be assembled/mounted ~~according to~~in accordance with the instructions supplied with it.

If mounting or assembly instructions are not supplied, the most adverse configuration shall be used and the mounting or assembly method shall be recorded in the test report. Fittings shall be tightened before testing and shall not be re-tightened unless specifically required in the manufacturer's instructions. If the configuration must be changed to produce the worst-case conditions, this shall be recorded in the test report.

For testing a range of related extension elements, only worst case(s) need to be tested.

The tests shall be carried out in indoor ambient conditions at a temperature between 15 °C and 27 °C. If during a test the temperature is outside of the range of 15 °C to 27 °C, the maximum and/or minimum temperature shall be recorded in the test report.

Extension elements which include structural hardware parts made of hygroscopic plastic materials, for example, polyamide, shall be conditioned at (23 ± 2) °C and a relative humidity of (50 ± 5) % for at least 7 ~~days~~d before testing.

In the case of designs not addressed in the test procedures, the test shall be carried out as far as possible as described, and deviations from the test procedure recorded in the test report.

Before beginning the testing, visually inspect the extension element thoroughly. Record any defects so that they are not assumed to have been caused by the tests. Carry out measurements when specified.

4.2 Application of forces

The forces in the static load tests shall be applied sufficiently slowly to ensure that negligible dynamic force is applied. Unless otherwise specified, each force shall be maintained for not less than 10 s and not more than 15 s.

The forces in durability tests shall be applied at a rate to ensure that excessive heating does not occur.

The forces may be replaced by masses. The relation 10 N ~~=~~ ≈ 1 kg may be used for this purpose.

4.3 Tolerances

Unless otherwise stated, the following tolerances are applicable:

— forces: ±5 % of the nominal force;

— velocities: ±5 % of the nominal velocity;

— masses: ±1 % of the nominal mass;

— dimensions: ±1 mm of the nominal dimension;

— angles: ±2° of the nominal angle.

The accuracy for the positioning of loading pads shall be ±5 mm.

4.4 Sequence of testing

The tests shall be carried out in the same sequence as the clauses are numbered in this document. If the clause sequence is not followed, the sequence shall be recorded in the test report.

4.5 Inspection and assessment of results

Before and after completion of each test, carry out the inspection as specified, after using adjustment devices, if available.

Before any measurements are taken, the loaded extension shall be moved 10 times over the total extension length.

Record any changes that have taken place since the initial inspection. The inspection shall include at least the following:

a) the fracture of any component or joint;

b) the loosening of any joint intended to be rigid, which can be demonstrated by hand pressure;

c) the deformation or wear of any part or component such that its functioning is impaired;

d) the loosening of any means of fixing components;

e) any impaired function of a component or part.

5 Test equipment

5.1 General

Unless otherwise specified, the tests may be applied by any suitable device~~,~~ because results are not dependent upon the apparatus.

The equipment shall not inhibit deformation of the extension element, i.e. it shall be able to move so that it can follow the deformation of the extension element during testing.

5.2 Masses

Masses shall be designed so that they do not reinforce the structure or re-distribute the stresses.

5.3 Glass/steel marbles

Marbles are made of solid glass with a 10 mm to 15 mm diameter. They shall be in a flexible bag large enough to allow them to move in the bag during the test.

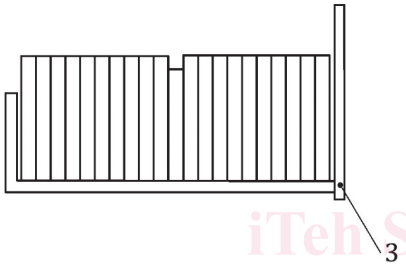
NOTE A bag that is approximately 50 % filled is considered loosely packed.

In cases where the volume of the glass marbles is greater than the volume of the extension element, steel marbles with ~~(~~6~~—~~ mm to 12~~)~~ mm diameter shall be used. This shall be noted in the test report.

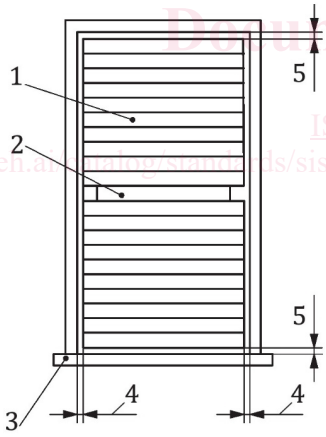
5.4 Loads for filing pockets

Suspended filing pockets shall be loaded with typing paper or an equivalent alternative as shown in Figure ~~1a~~1 a) and Figure ~~1b~~1 b).

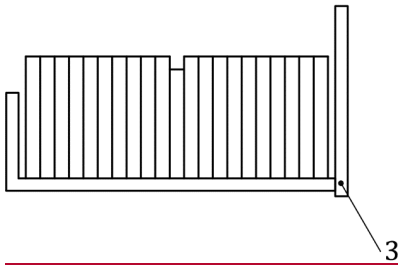
In cases where it is not possible to achieve the loading capacity with paper, the additional mass shall be steel and shall be positioned as the spacing material. This shall be noted in the test report.



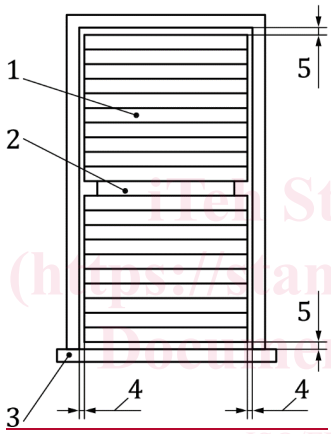
~~a) side view of extension element~~



~~b) top view of extension element~~



a) Side view of the extension element



b) Top view of the extension element

Key

1 typing paper
2 spacing material (for example, polystyrene) in the middle of the extension element
3 front of extension element
4 air gap
5 air gap 25 mm ± 6 mm

NOTE The air gap in Key 4 is determined by the paper size.

Deleted Cells

Figure 1 — Loading of suspended filing pockets with typing paper

5.5 Loading pad

The rigid disc has a 100-mm diameter (or a 50-mm diameter to be used in limited space), with a flat face and a 12-mm front edge blend radius.

All loading pads shall be capable of pivoting in relation to the direction of the applied force. The pivot point shall be as close as practically possible to the load surface.