
**Furniture — Storage units — Test
methods for the determination of
strength, durability and stability**

*Ameublement — Éléments de rangement — Méthodes d'essai pour la
détermination de la résistance, de la durabilité et de la stabilité*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 General test conditions	4
4.1 Preliminary preparation.....	4
4.2 Application of forces.....	5
4.3 Tolerances.....	5
4.4 Prevention of movement during test.....	5
4.5 Loading.....	6
5 Test equipment and apparatus	6
6 Test procedures for non-movable parts	8
6.1 Shelves.....	8
6.1.1 General.....	8
6.1.2 Shelf retention test — Horizontal outward force.....	8
6.1.3 Shelf retention test — Vertical downward force.....	8
6.1.4 Deflection of shelves.....	9
6.1.5 Strength of shelf supports.....	9
6.2 Tops and bottoms.....	10
6.2.1 Sustained load test for tops and bottoms.....	10
6.2.2 Static load test for tops and bottoms.....	11
6.3 Clothes rails and supports.....	11
6.3.1 Strength of supports.....	11
6.3.2 Strength of clothes rails.....	12
6.4 Strength of the structure.....	13
6.4.1 Test for structure, underframe and/or legs.....	13
6.4.2 Drop test.....	15
6.4.3 Tests for units with castors or wheels.....	15
7 Test procedures for movable parts	16
7.1 Pivoted doors.....	16
7.1.1 General.....	16
7.1.2 Strength of pivoted doors — Vertical load.....	16
7.1.3 Strength of pivoted doors — Horizontal force.....	16
7.1.4 Slam shut of pivoted doors.....	17
7.1.5 Durability of pivoted doors.....	18
7.2 Sliding doors and horizontal roll fronts.....	19
7.2.1 General.....	19
7.2.2 Slam shut/open of sliding doors and horizontal roll fronts.....	19
7.2.3 Durability of sliding doors and horizontal roll fronts.....	20
7.3 Flaps.....	20
7.3.1 General.....	20
7.3.2 Strength of bottom-hinged flaps.....	20
7.3.3 Durability of flaps.....	21
7.3.4 Drop test for horizontally top-hinged doors/flaps.....	21
7.3.5 Vertical downward static load of top hinged flaps.....	22
7.4 Vertical roll fronts.....	22
7.4.1 General.....	22
7.4.2 Slam shut/open of vertical roll fronts.....	22
7.4.3 Durability of vertical roll fronts.....	23
7.5 Extension elements.....	23
7.5.1 General.....	23

7.5.2	Strength of extension elements.....	23
7.5.3	Durability of extension elements.....	24
7.5.4	Slam shut of extension elements.....	26
7.5.5	Slam open of extension elements.....	26
7.5.6	Strength of bottoms in extension elements.....	27
7.5.7	Interlock test.....	27
7.6	Locking and latching mechanism test.....	27
7.6.1	General.....	27
7.6.2	Strength test for locking and latching mechanisms for extension elements.....	28
7.6.3	Locking and latching mechanisms for doors, flaps and roll fronts.....	28
7.6.4	Locking and latching mechanism durability test.....	28
8	Trays.....	28
8.1	General.....	28
8.2	Sustained load test for trays.....	28
8.3	Drop test for trays.....	28
9	Strength of coat hooks.....	29
10	Units mounted to the building or other structure.....	29
10.1	Units not supported by the floor.....	29
10.1.1	General.....	29
10.1.2	Movable parts, shelf supports, tops and bottoms.....	30
10.1.3	Static load.....	30
10.1.4	Dislodgement test.....	31
10.1.5	Sideward detachment test.....	31
10.2	Units supported by the floor.....	32
11	Stability tests.....	32
11.1	General.....	32
11.2	Doors, extension elements and flaps closed, all storage units unloaded.....	33
11.2.1	Units that are, or can be adjusted to, a height of 1 000 mm or less.....	33
11.2.2	Units that are, or can be adjusted to, a height of more than 1 000 mm.....	33
11.3	Opening doors, extension elements and flaps, all storage units unloaded.....	34
11.4	Doors, extension elements and flaps opened and unlocked.....	35
11.4.1	All storage areas unloaded and all doors, extension elements and flaps open.....	35
11.4.2	All storage areas unloaded with overturning load.....	36
11.4.3	All storage areas loaded with overturning load.....	37
11.4.4	Storage areas partly loaded.....	38
11.5	Doors, extension elements and flaps closed and locked, all storage units loaded.....	39
11.6	Dynamic stability test for units with castors.....	40
11.7	Strength test for anti-overturning device.....	41
11.8	Additional stability test methods for TV furniture.....	42
11.8.1	Determination of TV template.....	42
11.8.2	Stability of TV-furniture with one door and/or extension element opened.....	42
11.8.3	Stability of TV furniture with doors and extension elements closed — Storage areas unloaded.....	42
12	Test report.....	43
Annex A (informative) Guidance for the choice of loads, cycles, etc. for storage furniture strength, durability and stability tests.....		44
Annex B (informative) Suggested loads, cycles and forces for strength, durability and stability tests for storage furniture for domestic use.....		47
Annex C (informative) Rationale for selected test methods.....		52
Annex D (normative) Apparatus for slam-shut/open test of extension elements.....		59

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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This third edition cancels and replaces the second edition (ISO 7170:2005), which has been technically revised, and ISO 7171:2019, which has been merged into this document.

The main changes compared to the previous edition are as follows:

- addition of the Introduction;
- normative reference ISO 48-5:2018 replaces ISO 7619-2:2010;
- deletion of the pneumatic slamming apparatus for slam open and slam shut tests of extension elements;
- introduction of sideward detachment tests for units mounted to the building or other structure;
- introduction of a stability test for units with doors, extension elements and flaps, opened and unlocked with storage areas partly loaded;
- introduction of definitions, figures and additional a stability test method for units intended to support a TV-set;
- revision of the guidance for the choice of loads, cycles, etc. for strength, durability and stability testing in [Annex A](#);
- loads and forces for different applications have been merged in [Annex B](#).

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

This document has been developed with the objective of promoting relevant test methods for determining the strength, durability and stability of storage furniture, simulating normal functional use, as well as foreseeable misuse, that might reasonably be expected to occur. The tests are designed to evaluate properties without regard to materials, design/construction or manufacturing processes and intended to demonstrate the ability of the item to give satisfactory service in its intended environment.

The test results are only valid for the unit/component tested. These results can be used to represent the performance of production models prior to use, provided that the tested unit/component is representative of the production model. Only when properly justified, they can be used for failure analysis of a unit that has been in use.

The strength and durability tests do not assess the structure of the building, e.g. the strength of wall hanging cabinets includes only the cabinet and the parts used for the attachment. The wall and the attachment into the wall are not included.

Assessment of ageing and environmental degradation is not included.

Furniture — Storage units — Test methods for the determination of strength, durability and stability

1 Scope

This document specifies test methods for determining the strength, durability and stability of storage units, when fully assembled prior to use, including their movable and non-movable parts.

Acceptance criteria for the strength, durability and stability of the storage furniture is not specified by the test methods. Instead, suggested loads, cycles and forces are provided in [Annex B](#), depending on the applicability of the furniture.

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 48-5:2018, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 5: Indentation hardness by IRHD pocket meter method*

3 Terms and definitions

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

ISO and IEC maintain terminological 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

adjustable friction stay

component (3.7) to hold open a door or a *flap* (3.13) with a feature that keeps the door or flap open without any further assistance at a multitude of positions

3.2

bracket

rigid device to prevent overturning

Note 1 to entry: Normally made of metal; not a flexible device such as strap or cable tie.

3.3

built-in stop

device of the *component* (3.7) that limits the travel of *extension element* (3.12) or doors

3.4

catch device

device that keeps or pulls a *component* (3.7) in place but does not require a second action in order to release it

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