
Office furniture — Storage furniture —

Part 3: Test methods for the
determination of stability and strength
of the structure

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British Standard

ICS 97.140

National foreword

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la résistance de la structure

Büromöbel - Büroschränke - Teil 3: Prüfverfahren zur
Bestimmung der Standsicherheit und der Festigkeit der
Konstruktion

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Foreword

This document (EN 14073-3:2004) has been prepared by Technical Committee CEN/TC 207 "Furniture", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by February 2005.

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1 Scope

This document specifies test methods for the determination of strength of the structure of free standing or screen and wall hanging office storage furniture as well as stability of free standing units.

This document is applicable to mobile furniture, with the exception of the test described in 5.2 which is replaced by the test described in 6.7 of EN 14074:2004.

This document does not apply to high density mechanized filing systems, rotary filing systems, or plan files.

The tests are intended to simulate overbalancing forces and structural loads, which may occur during normal functional use, as well as misuse that might reasonably be expected to occur.

Safety depending on the structure of the building is not included, e.g. the strength of wall hanging cabinets includes only the cabinet and its parts. The wall and the wall attachment are not included.

Safety requirements can be found in EN 14073-2.

Assessment of ageing is not included.

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 14074:2004 *Office furniture – Tables and desks and storage furniture - Test methods for the determination of strength and durability of moving parts*

ISO 7619:2004 *Rubber - Determination of indentation hardness by means of pocket hardness meters.*

3 General test conditions

3.1 Preliminary preparation

The tests specified in this standard are designed to be applied to an item of furniture that is fully assembled and ready for use.

Before any of the tests are commenced, the item shall be old enough to ensure that it has developed its full strength.

The furniture shall be tested as delivered. Ready to Assemble furniture shall be assembled according to the instructions supplied with it. If the furniture can be assembled or combined in different ways, the most adverse combination shall be used for each test. This is also applicable to units that can be combined with other units or components.

Wall or screen mounted units shall be installed according to the manufacturer's instructions.

The tests shall be carried out in indoor ambient conditions but, if during a test, the atmosphere temperature is outside the range 15 °C to 25 °C the maximum and/or minimum temperature shall be recorded in the test report.

Tighten any assembly fittings before testing. Further retightening shall not take place unless it is specifically required by the manufacturer.

3.2 Test equipment

The forces in static load tests shall be applied sufficiently slowly to ensure that the influence of dynamic load is negligible. Unless otherwise stated, the static loads shall be maintained for (10 ± 2) s.

The test equipment shall be capable of following the deformations that may occur during the tests.

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

3.3 Tolerances

Unless otherwise stated:

all forces shall have an accuracy of $\pm 5\%$ of the nominal force;

all dimensions an accuracy of $\pm 1,0$ mm of the nominal dimension;

all masses to an accuracy of $\pm 0,5\%$ of the nominal mass;

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

The relationship $10\text{N} = 1\text{kg}$ may be used.

3.4 Sequence of testing

Unless otherwise specified, all tests shall be carried out on the same unit and in the sequence laid down in this standard.

For a multi shelf unit, all shelf tests shall be carried out on the same shelf.

4 Test apparatus

4.1 Floor surface

A rigid, horizontal and flat surface.

4.2 Wall surface

A rigid, vertical and flat surface.

4.3 Stops

Devices to prevent the unit from sliding, no higher than 12 mm except in cases where the design of the unit necessitates the use of higher stops, in which case the lowest that will prevent the item from sliding shall be used.

4.4 Masses

Masses shall not reinforce the structure or re-distribute the stresses.

If bags with metal shots, etc. are used they shall be divided into small compartments to prevent the contents from moving during the tests.

Loads shall be evenly distributed unless otherwise specified.

Suspended pocket files shall be loaded with typing paper or a suitable representation of it and where applicable pocket files shall be oriented in the most adverse direction.

4.5 Impact plates

Two steel impact plates, each one faced with a 3mm thick layer of rubber with hardness of (85 ± 10) IRHD according to ISO 7619:2004 :

a 2,5 kg impact plate, 200 mm x 160 mm x 10 mm, when the height above the shelf is ≥ 300 mm.

a 1,7 kg impact plate, 200 mm x 109 mm x 10 mm, when the height above the shelf is < 300 mm.

4.6 Loading pad

A rigid cylindrical object 100 mm in diameter (or 50 mm in diameter to be used in limited space), having a flat face and with 12 mm radius on the edge.

5 Test methods

5.1 Determination of loading on storage parts

All parts intended for storage purposes shall be uniformly loaded according to Table 1 unless otherwise specified by the manufacturer.

The volume of drawers shall be calculated from the area of the drawer bottom multiplied by the clear height.

The clear height is the distance between the top surface of the drawer bottom and the lower edge of the drawer front of the drawer above, or the structure of the unit.

Table 1 — Loads on Storage Components

Shelves	kg/dm ²	1,5
Clothes rails	kg/dm	5,0
Extension elements	kg/dm ³	0,5
Suspended pocket files	kg/dm ^{a)}	4,0
a) Measured perpendicular to the suspended pocket files		

5.2 Strength of unit

This test is not applicable to screen and wall hanging units or other built-in units attached to the building. Mobile furniture shall be tested according to 6.7 of EN 14074:2004.

Place the unit on the floor surface (4.1) with stops (4.3) located as in figure 1.

Unless otherwise specified by the manufacturer, load all parts that can be used for storage purposes, according to Table 1 (top surfaces shall be loaded as shelves). Close extension elements, flaps, roll fronts and doors.

Apply a horizontal static force of 350 N, 10 times at point A in figure 1, on the vertical centreline of the structure of the unit, 50 mm from the highest point at that position but not higher than 1600 mm from the floor.

NOTE: If the loading point is not on a structural member, a bridging bar should be used.

If the unit tends to overturn in one direction, lower the point of application of that force until tilting is just prevented in that direction only. Record the height.

The test may be carried out in a one stage cycle A, C, B, D or in a two stage cycle A, B followed by C, D.

Inspect the unit before and after the test.

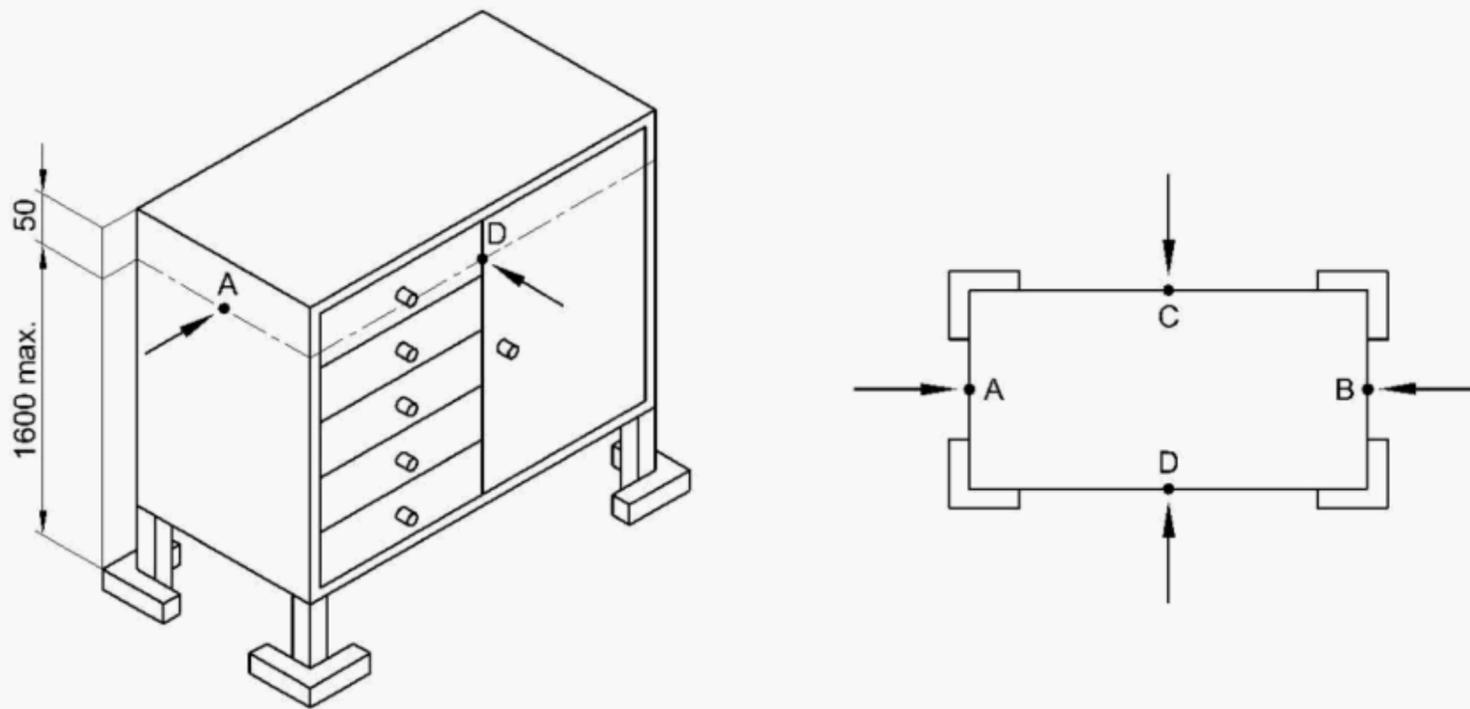


Figure 1 — Strength of unit

5.3 Shelves

5.3.1 Pull out of shelves

Apply a horizontal force of 50 % of the weight of the unloaded shelf, up to a maximum of 20N, to the middle of the front edge.

Record whether the shelf remains in the unit.

5.3.2 Strength of shelf supports

All supports of the shelf shall be tested.

For units with an indeterminate number of shelves, unless otherwise specified, divide the internal height of the unit in millimetres by 300 and take the nearer integer. This number minus 1 shall be the number of shelves to be fitted.

Where the shelves and shelf supports are identical, it is only necessary to test one shelf.

Where the shelves and shelf supports are not identical, each combination shall be tested.

Unless otherwise specified by the manufacturer, load the unit uniformly according to Table 1. Distribute the load uniformly on the shelf being tested except at approximately 220 mm from one support, where the impact plate (4.5) shall be tipped over 10 times at a point as close to the support as possible (see figure 2). The striking surface shall be that faced with rubber.

Inspect the shelf and the support before and after the tests.

Dimensions in millimetres

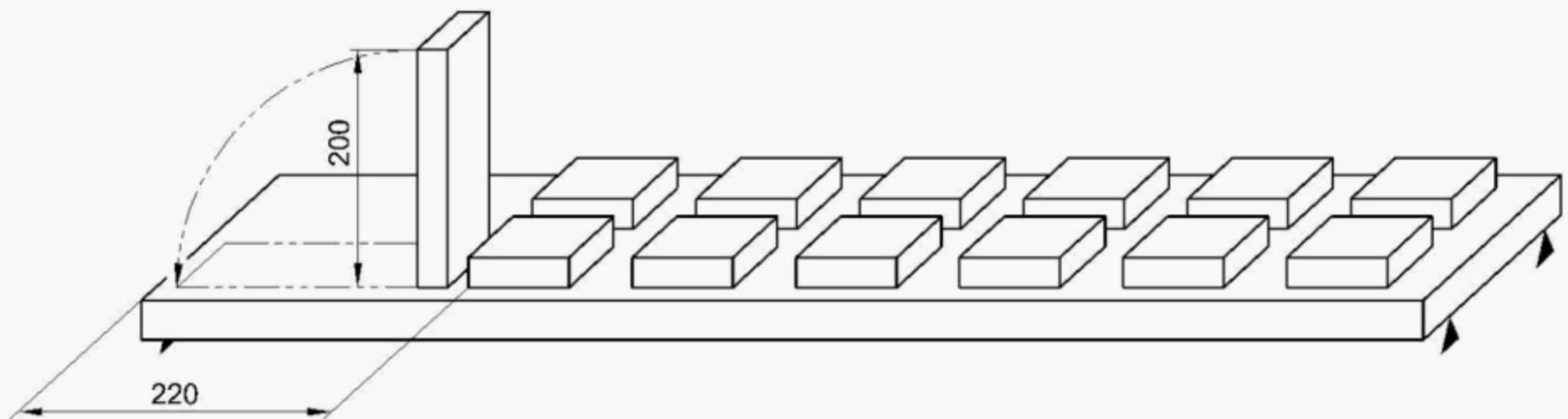


Figure 2 — Strength of shelf supports

5.4 Strength of top surfaces

This test shall be applied to top surfaces which are ≤ 1000 mm above the floor surface.

Apply a vertical force of 1000N, using the loading pad (4.6), 10 times at the position most likely to cause failure on the top surface but not less than 50 mm from one edge.

Inspect the top surface before and after the test.

5.5 Stability of free standing units

5.5.1 Stability of the unloaded unit

Place the unit on the floor surface (4.1).

Open all doors to 90°.

With the exception of any extension whose bottom front edge is ≤ 300 mm above the floor, fully extend as many extension elements as possible without overriding the interlocks (if fitted). Open flaps to their horizontal position or as near horizontal as possible.

Apply a vertical downwards load of 50N to any point likely to cause overturning, on the centreline of the front of an extension element and at 50 mm from the outer edge of a door or flap.

Record whether the unit overturns.

5.5.2 Stability of the loaded unit

Place the unit on the floor surface (4.1).

Unless otherwise specified by the manufacturer, load all storage components with the load specified in Table 1.

Open all doors to 90°.

With the exception of any extension element whose lower front edge is ≤ 300 mm above the floor, fully extend as many extension elements as possible without overriding the interlocks if fitted. Open flaps to their horizontal position or as near horizontal as possible.

Apply a vertical downwards force of 50 N to any point likely to cause overturning, on the centreline of the front of an extension element and at 50 mm from the outer edge of a door or flap.

Record whether the unit overturns.

5.6 Screen and wall hanging units

5.6.1 General

The unit shall be installed according to the manufacturer's instructions on its screen system or on a test wall, which will not show damages during the tests. Where the manner of installation is not clearly defined, the manner of installation shall be recorded.

Adjustable wall attachment devices shall be set in the position most likely to cause failure.

NOTE This position will normally be when adjusted to the maximum depth (as far from the wall as possible) and to the middle of the height adjustment range and when devices used for levelling adjustments are placed as low and as far apart as possible.

After the testing according to 5.6.2, 5.6.3 and 5.6.4 check if the unit remains attached as installed and if it supports the test load (5.6.4).

5.6.2 Dislodgment of screen and wall hanging cabinets and shelves

The unloaded unit shall be subjected to a dislodgment test by applying a force of 100 N upwards to the least favourable point on the front edge.

5.6.3 Tests on moving parts, shelf supports and top surfaces

Unless otherwise specified, load all components of the unit according to 5.1. As soon as possible after the loading, carry out the following tests, if applicable:

5.3.2 Strength of shelf supports

5.4 Strength of top surfaces

6.3 (EN 14074:2004) Hinged or pivoted doors

6.4.2 (EN 14074:2004) Slam shut/open of sliding doors and horizontal roll fronts

6.2.3 (EN 14074:2004) Slam shut/open test of extension elements

6.6.1 (EN 14074:2004) Strength of flaps

The tests shall always be carried out on that part most likely to cause failure to the wall or screen attachment.

5.6.4 Strength of screen and wall attachment devices

After carrying out the tests on the moving parts, increase the load on all storage areas according to the following principle:

If the number of shelves is not determined by the structure of the unit, divide the internal height of the unit by 300 mm. The number of shelves to be used during testing shall be the lower integer –1.

$$\frac{\text{Internal height of unit}}{300} - 1$$

Load the unit with 2 times the loads used in Table 1. The bottom and the top surfaces, provided it is not a moving part, shall be loaded as a shelf. Close all doors and extension elements.

The loading time shall be one week.

5.7 Floor standing unit attached to the building

The unit shall be mounted according to the manufacturer's installation instructions.

Apply a horizontal outwards force of 200 N forward to the centre of the top of the unit.

Record whether the unit remains attached to the building.

6 Test report

The test report shall include at least the following:

- a) number of this document
- b) details of the piece of furniture tested
- c) manner of installation if appropriate
- d) any defects observed before testing
- e) test results according to the applicable clauses
- f) details of any deviation from this document
- g) name and address of the test facility
- h) date of the test

Annex A
(informative)

A–deviations

A- deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/ CENELEC member.

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The "Arbeitsstättenverordnung" and the "Gesetz über technische Arbeitsmittel (Gerätesicherheitsgesetz) in der Fassung von 23. Oktober 1992, Bundesgesetzblatt III 8053-4" lays down that storage furniture shall conform to the German Standard DIN 4554.

Bibliography

EN 14073-2 *Office furniture – Storage furniture – Part 2 : Safety requirements (see clause 1 of this document)*

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