BRITISH STANDARD

BS 5873 :
Part 4 : 1998

Educational furniture

Part 4. Specification for strength and stability of storage furniture for educational institutions

ICS 97.140

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee FW/4, Educational furniture, upon which the following bodies were represented:

British Educational Suppliers Association
British Furniture Manufacturers' Federation
British Office Systems and Stationery Federation
Castor Manufacturers (UK) Association
Chartered Society of Designers
Clasp Development Group
Counties Furniture Group
Department for Education and Employment
FIRA International Ltd.
ICE (Ergonomics)
Kent County Council

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Contents

Foreword

This Part of BS 5873 has been prepared by Technical Committee FW/4. It supersedes BS 5873 : Part 4 : 1991 which is withdrawn. This revision includes additional requirements and test methods for trolleys and trays.

Individual purchasers may well be able to judge the general suitability of storage furniture by inspection but, if they are non-technical, they may not be able to assess its strength and suitability in use. It is for this reason that this standard specifies objective criteria for strength and stability of storage furniture which are based on the simulation of conditions of use.

The strength tests described in this standard reproduce normal use and common types of misuse to which storage furniture for educational institutions may be subjected. The tests are designed to be applied to an article that is fully assembled and ready for use and are intended only to determine strength of the structure. Two test levels are given for the tests: general and heavy. The general grade applies to furniture for normal use. The heavy grade applies only to bulk storage or storage of extremely heavy items such as large books.

The stability tests described in this standard determine the ability of the furniture to remain stable in normal use.

Tests carried out in accordance with this standard are intended to demonstrate the ability of the item to give satisfactory service in its intended environment. It should be understood that such tests do not ensure that structural failure will not eventually occur as a result of habitual misuse or after an excessively long period of service.

Attention is drawn to BS 4875 : Part 7, which describes methods of test for domestic and contract furniture that are very similar to those in this standard.

The other Parts of BS 5873 are as follows:

Part 1. *Specification for functional dimensions, identification and finish of chairs and tables for educational institutions*
Part 2. *Specification for strength and stability of chairs for educational institutions*
Part 3. *Specification for strength and stability of tables for educational institutions*
Part 5. *Specification for security of fixed secure storage units for educational institutions*

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 22, an inside back cover and a back cover.

Specification

1 Scope

This Part of BS 5873 specifies strength and stability requirements for storage furniture for educational institutions, including lockers, secure storage and trolleys. This standard applies specifically to school furniture and is not applicable to office furniture used by the administrative staff. Two test levels, general and heavy, are specified.

This Part of BS 5873 does not cover requirements and test methods for the security of fixed secure storage furniture which are dealt with in BS 5873 : Part 5.

2 References

2.1 Normative references

This Part of BS 5873 incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this Part of BS 5873 only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purposes of this Part of BS 5873 the following definition applies.

3.1 stability

Ability of an item of furniture to withstand forces that tend to cause it to tip over.

4 Strength and stability testing

4.1 Inspection before and after testing

4.1.1 *Inspection before testing*

Immediately before testing, each article shall be thoroughly inspected. Any defects in the members, joints or attachments of such components as flaps and extensions shall be noted so that they are not attributed to the effect of the tests when the tests have been completed.

Fittings in self-assembly furniture shall be tightened before testing.

4.1.2 *Inspection after testing*

Immediately after completion of the tests, the article shall again be thoroughly inspected. Any apparent defects shall be noted and a determination shall be made of any changes that have taken place since the initial inspection.

4.2 Moisture content and conditioning

Before the tests are commenced the article shall be sufficiently old to ensure that all component materials have developed their full strength. At least 4 weeks in normal conditions shall elapse from manufacture in the case of glued joints in timber, plastics moulded parts, etc.

Parts made of timber products shall have a moisture content of between 8 % and 12 %. If the moisture content is above 12 % the article shall be allowed to dry out in a warm ventilated room until the moisture content is between 8 % and 12 %.

If a standard atmosphere is required for conditioning or testing, that atmosphere shall be at a temperature of 23 °C ± 2 °C and a relative humidity of 50 % ± 5 %.

If there is not time for furniture to be aged or to reach equilibrium the moisture content shall be measured where applicable at the beginning and at the end of the testing sequence, and these measurements shall be included in the test report if they are outside the limits specified, together with the age of the article when testing commenced.

4.3 Setting up of furniture

The articles shall be tested as delivered. Self-assembly furniture shall be assembled according to the instructions supplied with the article. If the article can be combined in different ways the most adverse combination shall be used for each test.

This requirement shall also apply to furniture that can be combined with other articles. Articles intended for wall attachment shall be mounted on a wall so that secure attachment is achieved in every mounting position specified by the manufacturer.

Articles intended to be floor standing shall be placed on a flat and level floor.

4.4 Rate of carrying out tests

The test forces shall be applied at a sufficiently slow rate to ensure that negligible dynamic load is applied and also to ensure that kinetic heating does not occur.

NOTE. It is recommended that the tests are carried out at a maximum rate of 6 cycles/min.

4.5 Test loading and measurements

4.5.1 *Classification of loadings*

Loadings are classified as follows.

a) *Functional loadings.* Test loadings applied to storage furniture to cause stresses to simulate those caused by use of the furniture for storage purposes.

b) *Static loading.* Steady and gradual application (up to the maximum that the storage furniture may be required to withstand) of a test loading, repeated a sufficient number of times to make sure of the static strength of the furniture.

c) *Fatigue loading.* Repeated application to storage furniture, in a steady and gradual manner, of the load which is likely to occur most frequently.

4.5.2 *Measurements*

Unless otherwise stated for a particular test, measurements shall be made within the following tolerances.

a) All loads and forces shall be measured to an accuracy of $\pm$ 5 %.

b) All masses shall be measured to an accuracy of $\pm$ 0.5 %.

c) All dimensions shall be measured to an accuracy of $\pm$ 1.0 mm.

d) All angles shall be measured to an accuracy of $\pm 2^{\circ}$.

NOTE. The tests may in certain cases be carried out by means of loads or forces. For practical purposes a force of 10 N may be taken to be equal to the downward force due to a mass of 1 kg.

4.6 Combinations of tests

The strength tests shall be carried out on the same article of furniture. The forces to be applied and the number of cycles of application shall be as given in table 1.

Tests on a particular component shall be carried out in the order given in table 1.

NOTE 1. The different component parts of an item may be tested in any order and not necessarily in the order given in table 1.

Components that have a dual function shall be subjected to the relevant tests for each function, e.g. a shelf that can be pulled out on runners shall be subjected to the tests for shelves and additionally to the wear and fatigue tests for drawers and runners.

For an article fitted with a number of flaps, drawers or doors that are identical in every respect (apart from the direction of opening and closing), it shall be permissible to test only one of the relevant flaps, doors or drawers. Other flaps, drawers or doors fitted to the article shall each be tested separately.

NOTE 2. If tests are intended to prove a range of equipment, this may be achieved by testing the most highly stressed units or parts of units. It is possible, therefore, at the discretion of the test authority, to cover the testing of the whole range by carrying out the test programme given in table 2.

NOTE 3. The tests can be considered to cover only items or components which are manufactured of precisely the same material and are similar in construction and design.

5 Strength requirements

5.1 Shelves, horizontal surfaces and clothes hanging rails

5.1.1 *Strength of shelf supports*

After testing in accordance with **A.1**, the shelf supports shall conform to **5.11**.

5.1.2 *Deflection of shelves*

After testing in accordance with **A.2**, the deflection of the shelves shall not exceed the following values:

– particle board: span/200;

– wood: span/150;

– other materials: span/100.

5.1.3 *Strength of top and bottom surfaces*

After testing in accordance with **A.3**, the top and bottom surfaces shall conform to **5.11**.

5.1.4 *Strength of clothes hanging rails supports*

After testing in accordance with **A.4**, the clothes hanging rail supports shall conform to **5.11**.

5.1.5 *Deflection of clothes hanging rails*

After testing in accordance with **A.5**, the increase in the deflection of the clothes hanging rail after 1 week shall be less than the span/100.

5.2 Pivoted doors

5.2.1 *Strength of pivoted doors*

After testing in accordance with **B.1**, the pivoted doors shall conform to **5.11**.

5.2.2 *Wear and fatigue of pivoted doors*

After testing in accordance with **B.2**, the pivoted doors shall conform to **5.11**.

5.2.3 *Slamming open and shut of pivoted doors*

After testing in accordance with **B.3**, the pivoted doors shall conform to **5.11**.

5.3 Sliding doors

5.3.1 *Wear and fatigue of sliding doors*

After testing in accordance with **C.1**, the sliding doors shall conform to **5.11**.

5.3.2 *Slamming open and shut of sliding doors*

After testing in accordance with **C.2**, the sliding doors shall conform to **5.11**.

5.4 Flaps

5.4.1 *Strength of flaps*

After testing in accordance with **D.1**, the flaps shall conform to **5.11**.

5.4.2 *Wear and fatigue of flaps*

After testing in accordance with **D.2**, the flaps shall conform to **5.11**.

Table 1. Summary of test procedures

Test	Test level	
	General	**Heavy**
	Number of applications and test forces	**Number of applications and test forces**
Strength of top and bottom surfaces (**A.3**):		
Top surface		
Height above the floor:		
– Less than 1050 mm	1250 N	2 × 900 N
– 1050 mm and above	450 N	700 N
Bottom surface		
Wall units	1000 N	1250 N
Floor units, unrestricted headroom	1000 N	1250 N
Floor units, headroom less than 1050 mm	450 N	700 N
Strength of pivoted doors (**B.1**)	30 kg 10 cycles	45 kg 10 cycles
Wear and fatigue of pivoted doors (**B.2**)	80 000 cycles	80 000 cycles
Slam open of pivoted doors (opening force) (**B.3**)	2 kg 10 cycles	3 kg 10 cycles
Slam shut of pivoted doors (closing force) (**B.3**)	2.5 kg 20 000 cycles	3 kg 20 000 cycles
Wear and fatigue of sliding doors (**C.1**)	80 000 cycles	80 000 cycles
Slam open/shut of sliding doors (**C.2**)	4.0 kg 10 cycles	6.0 kg 10 cycles
Strength of flaps (**D.1**)	300 N	500 N
Wear and fatigue of flaps (**D.2**)	40 000 cycles	40 000 cycles
Slam shut of roll fronts (**E.1**)	40 cycles	40 cycles
Wear and fatigue of roll fronts (**E.2**)	40 000 cycles	40 000 cycles
Strength of drawer runners (**F.1**)	375 N 10 cycles	450 N 10 cycles
Slam open/slam shut of drawers (**F.2**)		
	Velocity at calibration points	Velocity at calibration points
slam open/slam shut 5 kg	1.85 m/s	2.05 m/s
slam open/slam shut 35 kg	1.25 m/s	1.40 m/s
Displacement of bottom surface of drawers (**F.3**)	70 N	70 N
Wear and fatigue of drawers and runners (**F.4**)	80 000 cycles	80 000 cycles
Strength of trays:		
Sustained load (**G.1**)	0.1 kg/mm of internal depth	0.1 kg/mm of internal depth
Vertical downward static load (**G.2**)	up to 35 kg 10 cycles	up to 35 kg 10 cycles
Wear and fatigue of trays and runners (**G.3**)	0.05 kg/mm of internal depth 40 000 cycles	0.05 kg/mm of internal depth 40 000 cycles
Drop test (**G.4**)	10 drops from 350 mm	10 drops from 700 mm
Strength of carcase and underframe (**H.1**)	450 N 10 cycles	600 N 10 cycles

Table 1. Summary of test procedures *(continued)*

Test	Test level	
	General	**Heavy**
	Number of applications and test forces	**Number of applications and test forces**
Strength of trolleys:		
Sustained load (**J.1**)	3 × working load for each load bearing component	3 × working load for each load bearing component
Castor/wheel pin retention (**J.2**)	5 kg suspended from castor/wheel for 2 min	5 kg suspended from castor/wheel for 2 min
Hazard fatigue (**J.3**)	5 mm step, 2 mm step 2000 cycles	5 mm step, 2 mm step 5000 cycles
Obstruction impact (**J.5**)	not required	20 kg per castor/wheel 3 cycles
Horizontal fatigue (**J.6**)	20 N 30 000 cycles	25 N 50 000 cycles
Long distance running (**J.4**)	not required	20 kg per castor/wheel Speed 3.22 km/h (2 mph) for a distance of 150 km
Strength of coat hooks (annex K)	460 N	460 N

Table 2. Order of tests for ranges of furniture

Item	Order of tests
The largest floor unit and the largest hanging unit (if this does not include the longest shelf span unit then the unit containing this item is also tested)	Strength of shelf supports Deflection of shelves Strength of top and bottom surfaces Strength of carcase and underframe Strength of wall attachment devices
The relevant door whose geometry creates the greatest bending moment on the hinge	Strength of pivoted doors Slam open of pivoted doors Slam shut of pivoted doors Wear and fatigue of pivoted doors
The largest sliding door	Slam shut/open of sliding doors Wear and fatigue of sliding doors
The largest hinged flap	Strength of flaps Wear and fatigue of flaps
The largest roll front (vertical)	Slam shut of roll front Wear and fatigue of roll front
The largest drawer	Strength of runners Slam open of drawers Slam shut of drawers Displacement of drawer bottoms Wear and fatigue of drawers and runners
The longest clothes hanging rail	Strength of clothes hanging rail supports Deflection of clothes hanging rails
The largest tray	Sustained load Vertical downward static load Wear and fatigue of tray and runners Drop test
The most heavily loaded castor/wheel	Sustained load Pin pull out Hazard fatigue Horizontal fatigue Long distance running Obstruction impact

5.5 Roll fronts

5.5.1 *Slamming shut of roll fronts*

After testing in accordance with **E.1**, the roll front shall conform to **5.11**.

5.5.2 *Wear and fatigue of roll fronts*

After testing in accordance with **E.2**, the roll front shall conform to **5.11**.

5.6 Drawers

5.6.1 *Strength of runners*

After testing in accordance with **F.1**, the runners shall conform to **5.11**.

5.6.2 *Slamming open and shut of drawers*

After testing in accordance with **F.2**, the drawers shall conform to **5.11**.

The force required to move the drawers during the test shall not exceed 70 N and the force to maintain movement shall not exceed 45 N.

5.6.3 *Displacement of bottom surface of drawers*

After testing in accordance with **F.3**, the drawers shall conform to **5.11**.

5.6.4 *Wear and fatigue of drawers and runners*

After testing in accordance with **F.4**, the drawers and runners shall conform to **5.11**.

The force required to move the drawers during the test shall not exceed 70 N and the force maintain the movement shall not exceed 45 N.

5.7 Trays

5.7.1 *Sustained load*

After testing in accordance with **G.1**, the tray shall conform to **5.11**.

5.7.2 *Vertical downward static load*

After testing in accordance with **G.2**, the tray shall conform to **5.11**.

5.7.3 *Wear and fatigue of tray and runners*

After testing in accordance with **G.3**, the tray and runners shall conform to **5.11**.

After testing in accordance with **G.3**, the force required to operate the loaded tray at the end of the test shall be not more than 20 % greater than that required at the beginning of the test.

5.7.4 *Tray drop*

After testing in accordance with **G.4**, the tray shall conform to **5.11**.

5.8 Carcase and underframe

5.8.1 *Strength of carcase and underframe*

After testing in accordance with **H.1**, the carcase and underframe shall conform to **5.11**.

5.8.2 *Strength of wall attachment devices*

After testing in accordance with **H.2**, the wall attachment devices shall conform to **5.11**.

5.9 Strength of trolleys

5.9.1 *Sustained load*

After testing in accordance with **J.1**, the trolley shall conform to **5.11**.

5.9.2 *Castor/wheel pin retention*

During the castor/wheel pin retention test as described in **J.2**, the castor/wheel shall not separate from the item to which it is fitted.

5.9.3 *Hazard fatigue*

After testing in accordance with **J.3**, the trolley shall conform to **5.11**.

5.9.4 *Long distance running*

After testing in accordance with **J.4**, the trolley shall conform to **5.11**.

5.9.5 *Obstruction impact*

After testing in accordance with **J.5**, the trolley shall conform to **5.11**.

5.9.6 *Horizontal fatigue*

After testing in accordance with **J.6**, the trolley shall conform to **5.11**.

5.10 Strength of coat hooks

After testing in accordance with annex K, the coat hooks shall conform to **5.11**.

5.11 Acceptance criteria

NOTE. The test results are valid only for the article tested.

If the test results are intended to be applied to other similar articles, the test specimen should be representative of the production model.

After testing in accordance with annexes A to K, as applicable, the article shall be examined and shall conform to the following criteria.

a) There shall be no fracture of any member, joint or component.

NOTE. Stress whitening is not considered to be a failure;

b) There shall be no loosening, shown to be permanent by hand pressure applied to suitable members, of joints intended to be rigid.

c) There shall be no deformation or wear of any component that might essentially affect its function.

d) There shall be no loosening of any means of fixing components to the article.

e) Moveable parts shall open and close freely and catches shall operate smoothly.

6 Stability requirements

When tested in accordance with **L.1** and **L.2** the article shall not overturn.

NOTE. Units with a depth of 320 mm or less are not required to conform to the stability requirements provided that they have a means of attachment to the structure of the building.

7 Glass

Any glass included in the construction of school furniture shall conform to the requirements of Class B of BS 6206 : 1981.

8 Marking

Each article of furniture shall be clearly and indelibly marked, or shall have an indelible label permanently attached, to show the following information:

a) the name, trade mark or other means of identification of the manufacturer;

b) the number and date of this British Standard, i.e. BS 5873 : Part 4 : 1998[1)];

c) the test level that the article has been tested against, G (general) or H (heavy).

9 Information to be supplied by the manufacturer

For self assembly furniture with fittings which need to be retightened periodically, the manufacturer shall supply instructions with the furniture to this effect.

[1)] Marking BS 5873 : Part 4 : 1998 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

Annexes

Annex A (normative)
Tests on shelves, horizontal surfaces and clothes hanging rails

A.1 Test for strength of shelf supports

A.1.1 *Apparatus*

A.1.1.1 *Loads*, for loading the article during testing. These shall be masses that do not reinforce the structure or redistribute the load. If metal bars are used, the front row of masses shall be aligned with the front edge of the surface. If bags with lead shot etc. are used, the bags shall be divided into small compartments to prevent the contents moving during testing. Suspended pocket files shall be loaded with files filled with typing paper or a suitable representation of it.

A.1.1.2 *Steel impact plates*, as detailed in table A.1.

Table A.1 Steel impact plates

Parameter	Test level	
	General	Heavy
Mass	1.7 kg	2.5 kg
Approximate width	109 mm	160 mm
Approximate thickness	10 mm	10 mm
Length	200 mm	200 mm
Energy on impact	1.66 J	2.45 J

A.1.2 *Procedure*

Test shelves in the standard atmosphere for conditioning and testing specified in **4.2**.

Load all parts intended for storage purposes, except for the part being tested, with the mass given in table A.2.

Table A.2 Average loads applied to parts other than the part being tested

Part	Load at test level	
	General	Heavy
Horizontal surfaces, shelves and door baskets (in kg/10 000 mm^2)	1.25	1.25
Drawers and extension elements (in kg/dm^3 of internal volume)	0.3	0.4
Suspended pocket file fittings (in kg/100 mm length)	1.25	1.25
Trays (kg/mm of internal depth)	0.025	0.025
Clothes hanging rails (in kg/100 mm length)	2.0	2.0
Coat hooks (in kg per component on which items can be hung)		
for $A \leq 50$ mm[1)]	0.8	0.8
for $A > 50$ mm[1)]	2.5	2.5

[1)] See figure K.1.

Load the shelf being tested with the appropriate mass given in table A.3.

Distribute the masses uniformly except at approximately 220 mm from one support (see figure A.1) where a steel impact plate (**A.1.1.2**) of the appropriate mass given in table A.1 is placed. Allow the impact plate to tip over 10 times at a point as close as possible to the supports.

Inspect the shelf and its supports.

Table A.3 Maximum loads applied to parts undergoing test

Part	Load at test level	
	General	Heavy
Horizontal surfaces, shelves and door baskets (in kg/10 000 mm^2)	2.5	3.0
Drawers and extension elements (in kg/dm^3 of internal volume)	0.65	0.8
Suspended pocket file fittings (in kg/100 mm length)	2.5	2.5
Trays (kg/mm internal depth)	0.05	0.05
Clothes hanging rails (in kg/100 mm length)	4.0	4.0

A.2 Test for deflection of shelves

NOTE. For the purposes of deflection tests, the term 'shelf' includes the top and bottom of the cabinet.

A.2.1 *Apparatus*

A.2.1.1 *Loads*, as described in **A.1.1.1**.

A.2.1.2 *Means of measuring dimensions*, to an accuracy of ± 0.2 mm.

A.2.2 *Procedure*

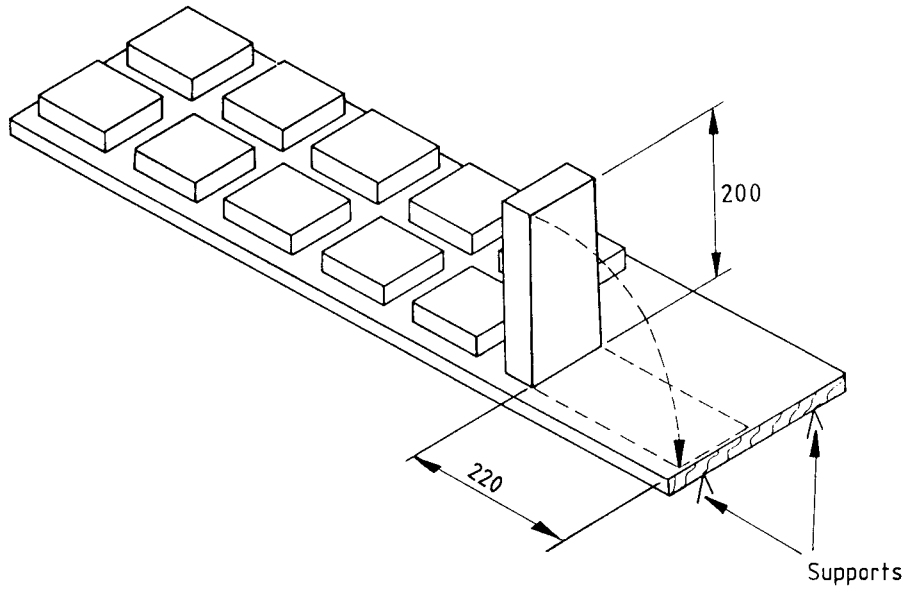
Test shelves in the standard atmosphere for conditioning and testing specified in **4.2**.

Load all parts intended for storage purposes, except for the part being tested, with the mass given in table A.2.

Place the shelf being tested on its supports in the carcase and measure any deflection from the horizontal. Uniformly load with the appropriate mass given in table A.3 (see figure A.2).

Measure the deflection (in millimetres) at whichever points are most adversely affected by the load after 1 week of loading. These deflections can occur between any two supports on the shelf (including any centre supports).

To determine the number of shelves to fit for articles having an indeterminate number of shelves, divide the height of the article in millimetres by 200 and take the lower integer, and then subtract one.



Dimensions in millimetres

Figure A.1 Test for strength of shelf supports

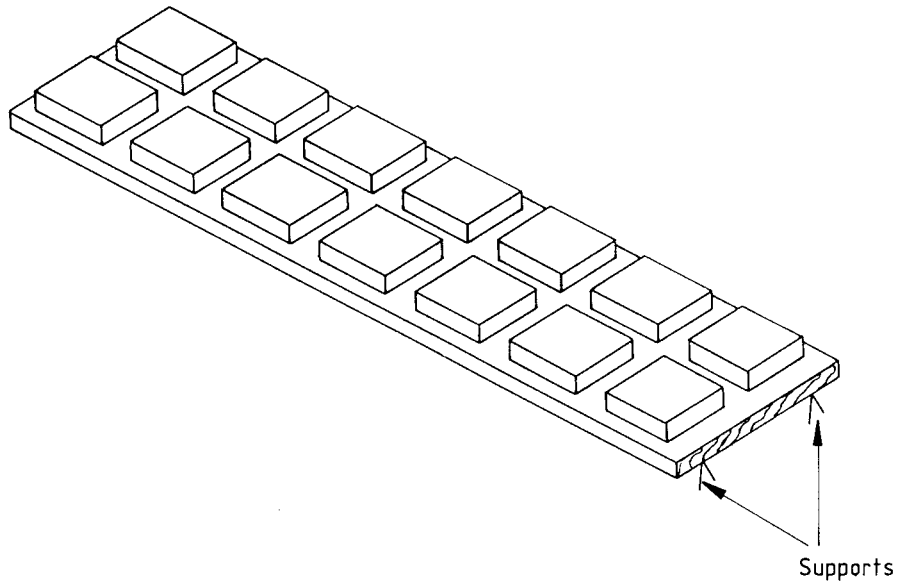


Figure A.2 Test for deflection of shelves

For cabinets that have shelves structurally interconnected or supported at points other than their extreme ends, load all surfaces that may be affected by the deflection of the shelf under load to the levels given in table A.3.

A.3 Test for strength of top and bottom surfaces

A.3.1 *Apparatus*

A.3.1.1 *Means of applying required forces.*

A.3.1.2 *Loading pad*, 75 mm × 75 mm having a smooth hard surface and rounded edges.

A.3.1.3 *Loads*, as described in **A.1.1.1**.

A.3.2 *Procedure*

Test surfaces in the standard atmosphere for conditioning and testing specified in **4.2**.

Load all parts intended for storage purposes, except for the part being tested, with the mass given in table A.2.

Subject the top and bottom surfaces to 10 vertical applications of the appropriate force given in table 1 using the loading pad (**A.3.1.2**). Apply the force to any position likely to cause failure. If there are several such positions apply the force 10 times to a maximum of three positions.

If the top or bottom surface is adjustable place it in the most likely position to cause failure.

For the heavy test level (H) use two vertical downward forces spaced 560 mm apart, equidistantly spaced about the point of load application. For cabinets having a major dimension of less than 560 mm apply one force of 900 N.

A.4 Test for strength of clothes hanging rail supports

A.4.1 *Apparatus*

A.4.1.1 *Loads*, as described in **A.1.1.1**.

A.4.2 *Procedure*

Test the clothes hanging rail supports in the standard atmosphere for conditioning and testing specified in **4.2**.

Load all parts intended for storage purposes, except for the part being tested, with the mass given in table A.2.

Place the clothes hanging rail on its supports in the carcase. Load with the appropriate mass given in table A.3, concentrated at the weakest support (see figure A.3). If there are three or more supports load each section with the appropriate mass given in table A.3. Inspect the rail and supports after approximately 1 h.

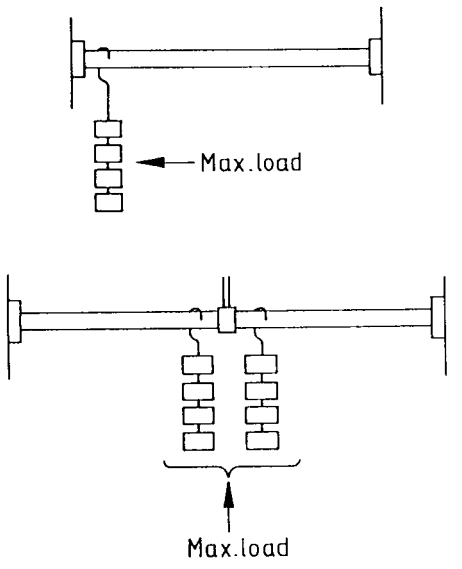


Figure A.3 Test for strength of clothes hanging rail supports

A.5 Test for deflection of clothes hanging rails

A.5.1 *Apparatus*

A.5.1.1 *Loads*, as described in **A.1.1.1**.

A.5.1.2 *Means of measuring dimensions*, to an accuracy of $\pm$0.2 mm.

A.5.2 *Procedure*

Test clothes hanging rails in the standard atmosphere for conditioning and testing specified in **4.2**.

Load all parts intended for storage purposes, except for the part being tested, with the mass given in table A.2.

Place the clothes hanging rail on its supports in the carcase and measure the deflection of the middle of the rail before loading. Uniformly load the clothes hanging rail with the appropriate mass given in table A.3 (see figure A.4). Leave loaded for 1 week and remeasure the deflection of the middle of the clothes hanging rail while still loaded.

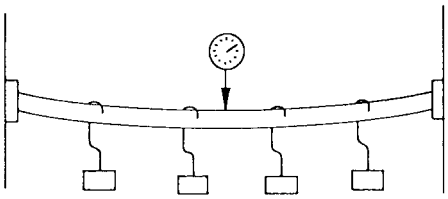


Figure A.4 Test for deflection of clothes hanging rails

Annex B (normative)
Tests on pivoted doors

NOTE. Up-and-over doors should be subjected to the operational test only (see **B.2**) since no other type of loading is considered appropriate.

B.1 Test for strength of pivoted doors

B.1.1 *Apparatus*

B.1.1.1 *Loads*, as described in **A.1.1.1**.

B.1.2 *Procedure*

Check the appearance and function of the door, both when the door is open and closed. Load all parts (including baskets) intended for storage purposes with the appropriate mass given in table A.2.

Attach a load of the appropriate mass given in table 1 so that its mass is equally distributed on both sides of the door and so that its centre of gravity acts 100 mm from the handle edge of the door (see figure B.1). Swing the door gently 10 full cycles (back and forth) from a position 45° from fully closed to a position 10° from fully opened, but through a maximum angle of swing of 135°.

B.2 Test for wear and fatigue of pivoted doors

B.2.1 *Apparatus*

B.2.1.1 *Loads*, as described in **A.1.1.1**.

B.2.2 *Procedure*

Check the appearance and function of the door, both when the door is open and closed. Load all parts (including baskets) intended for storage purposes with the appropriate mass given in table A.2.

Swing the door for the appropriate number of cycles (back and forth) given in table 1, starting from the fully closed position to a position about 10° from the fully open position, subject to a maximum angle of swing of 130°. Operate any catching device on each cycle.

During each cycle fully and gently close the door.

B.3 Slam open/shut test for pivoted doors

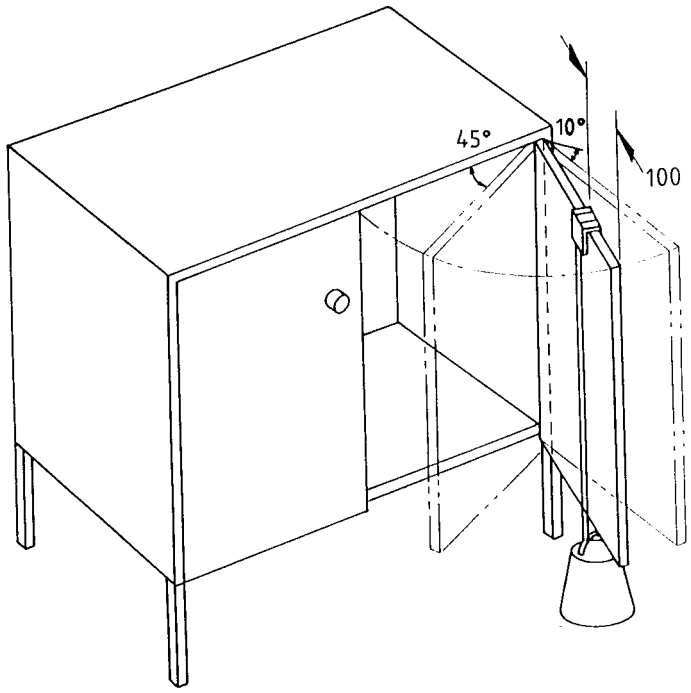
B.3.1 *Apparatus*

B.3.1.1 *Loads*, as described in **A.1.1.1**.

B.3.1.2 *Means of applying the required forces.*

B.3.1.3 *Braided nylon cord*[2)], approximately 2 m long.

B.3.1.4 *Pulley*, to suit the cord.



Linear dimension is in millimetres

Figure B.1 Test for strength of pivoted doors

[2)] Cord type CA103 specified in DTD 5620 issued by the Ministry of Defence has been found to be suitable.

B.3.2 ***Procedure***

Load all parts (including baskets) intended for storage purposes with the appropriate mass given in table A.2.

Attach the cord (**B.3.1.3**) to the handle, or if there is no handle, as near as possible to the middle of the outer edge of the door. Attach the appropriate mass specified in table 1 to the cord and pass it over a pulley (**B.3.1.4**) so that the cord is perpendicular to the face of the door at the end of its travel. Open/close the door through an angle of 30° and allow it to close/open freely under the influence of the mass. An external support shall be placed so that the weight is supported when the door is within 10 mm of the fully closed/open position. Repeat the test 10 times for opening and 20 000 times for closing.

Annex C (normative)

Tests on sliding doors

NOTE. These tests should also be carried out on vertical sliding doors.

C.1 Test for wear and fatigue of sliding doors

C.1.1 ***Apparatus***

C.1.1.1 *Loads*, as specified in **A.1.1.1**.

C.1.2 ***Procedure***

Check the appearance and function of the door, both when the door is fully open and fully closed.

Load all parts intended for storage purposes with the mass given in table A.2.

Open and close the door for the appropriate number of cycles given in table 1, starting from the fully closed position to a position approximately 50 mm from the fully open position. Operate any catching device on each cycle. During each cycle fully and gently close the door.

C.2 Slam open/shut test for sliding doors

C.2.1 ***Apparatus***

C.2.1.1 *Loads*, as described in **A.1.1.1**.

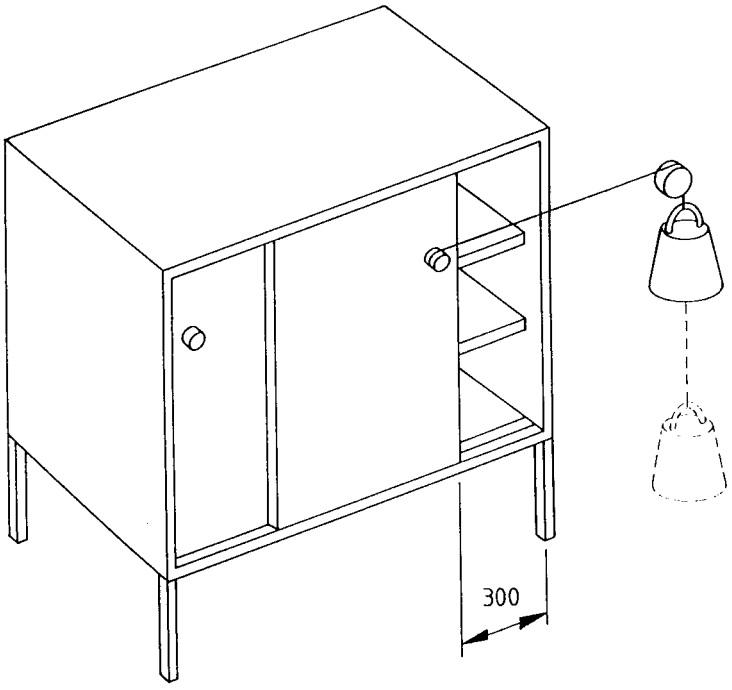
C.2.1.2 *Braided nylon cord*, as described in **B.3.1.3**.

C.2.2 ***Procedure***

Check the appearance and function of the door, both when the door is fully open and fully closed.

Load all parts intended for storage purposes with the mass given in table A.2.

Attach the cord (**C.2.1.2**) to the handle, or if there is no handle, as near as possible to the middle of the outer edge of the door. Attach the appropriate mass given in table 1 to the cord and pass it over a pulley so that the cord is parallel to the movement of the door, (see figure C.1). Open/close the door through a distance of 300 mm or the total travel of the door (whichever is the smaller), and allow to close/open freely, supporting the mass with the cord throughout the test. Repeat the test 10 times for opening and 10 times for closing.



Dimension is in millimetres.

Figure C.1 Arrangement for slam open/shut test of sliding doors

Annex D (normative)
Tests on flaps

D.1 Test for strength of flaps

D.1.1 *Apparatus*

D.1.1.1 *Loads*, as specified in **A.1.1.1**.

D.1.2 *Procedure*

Check the appearance and function of the flaps, hinges etc., both when the flap is fully open and fully closed.

Load all parts intended for storage purposes with the loads given in table A.2.

Set the flap in its fully open position. Load 10 times with the appropriate force given in table 1, at a point 50 mm from the weakest corner, (see figure D.1). If the article tends to overturn during the test either increase the load on the article, or fix the article to the floor.

D.2 Test for wear and fatigue of flaps

D.2.1 *Apparatus*

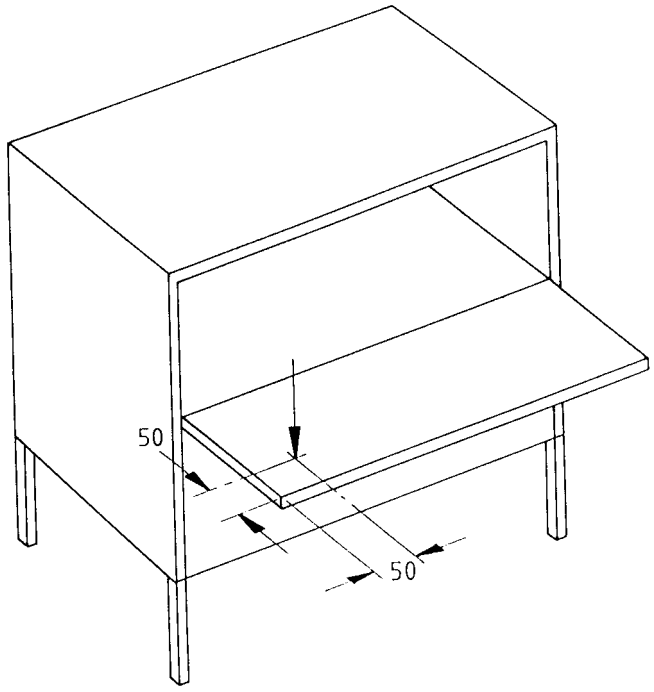
D.2.1.1 *Loads*, as described in **A.1.1.1**.

D.2.2 *Procedure*

Check the appearance and function of the flaps, hinges etc., both when the flap is fully open and fully closed.

Load all parts intended for storage purposes with the load given in table A.2.

Open and close the flap fully and gently for the appropriate number of cycles given in table 1, operating any catching device. Pull the flap past the point of equilibrium on each cycle and support lightly throughout the rest of the cycle so that any braking device is activated.



Dimensions in millimetres.

Figure D.1 Test for strength of flaps

Annex E (normative)
Tests on roll fronts

NOTE. Horizontal roll fronts should be tested as sliding doors (see annex C), but using the number of cycles for roll fronts given in table 1.

E.1 Slam shut test for roll fronts

E.1.1 *Apparatus*

E.1.1.1 *Loads*, as specified in **A.1.1.1**.

E.1.2 *Procedure*

Check the appearance and function of the roll front, both when it is fully open and fully closed.

Load all parts intended for storage purposes with the appropriate load given in table A.2.

Allow the roll front to fall freely from near the point of equilibrium, see figure E.1, for the appropriate number of cycles given in table 1. If the roll front does not fall freely perform the test as for sliding doors (see **C.2**).

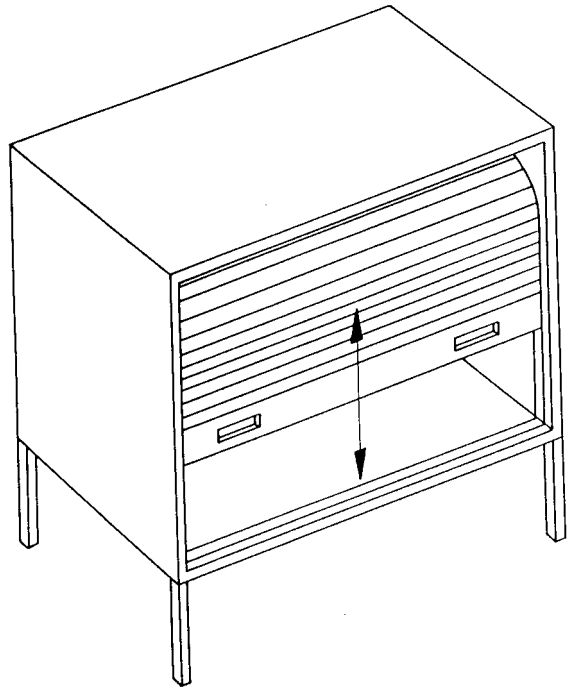


Figure E.1 Slam shut test of roll front

E.2 Test for wear and fatigue of roll fronts

Carry out the test in the same manner as described for flaps (see **D.2**) for the appropriate number of cycles given in table 1.

Annex F (normative)
Tests on drawers

F.1 Test for strength of runners

F.1.1 *Apparatus*

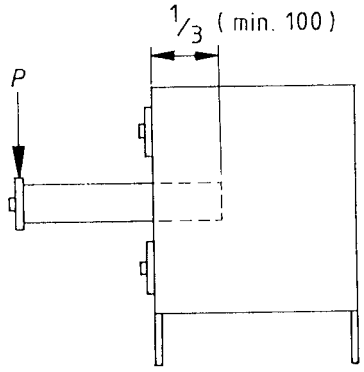
F.1.1.1 *Loads*, as described in **A.1.1.1**.

F.1.1.2 *Means of applying required force.*

F.1.2 *Procedure*

Load all parts intended for storage purposes, except for the drawer undergoing test, with the appropriate load given in table A.2.

Open the drawer to its front stops (if fitted) or to the point at which one-third of the inside length (depth) of the drawer, or at least 100 mm, remains inside the carcase (see figure F.1). Apply a load to the bottom surface of the drawer as given in table A.3. Apply an increasing vertical force, *P*, to one corner of the drawer until it has deflected downwards to a point 100 mm below its horizontal position or until the appropriate force given in table 1 has been reached. Maintain the force for 5 s to 10 s. Carry out the test 10 times.



Dimension is in millimetres.

Figure F.1 Test for strength of runners

F.2 Slam open/shut test for drawers

F.2.1 *Apparatus*

F.2.1.1 *Loads*, as described in **A.1.1.1**.

F.2.1.2 *Drawer slamming machine*, capable of calibration in accordance with annex M to open or slam shut drawers.

NOTE. A schematic diagram of a suitable machine is given in figure A.1 of BS EN 1153 : 1995.

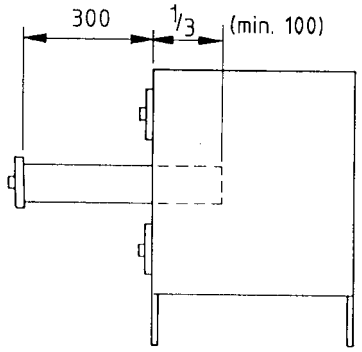
F.2.2 ***Procedure***

Examine the drawer and runners before the test.

Load all parts intended for storage purposes, except for the drawer undergoing test, with the appropriate load given in table A.2.

Calibrate the drawer slamming machine using the method described in annex M, so that it produces the closing velocities for the chosen test level given in table 1. Position the apparatus so that the ram reaches the end of its stroke 10 mm before the drawer reaches the end of its travel.

Place the drawer on its runners and load with the appropriate load given in table A.3. Open the drawer from the fully closed position to a maximum of 300 mm, or to the point at which one-third of the inside length (depth) of the drawer, or at least 100 mm, remains inside the carcase (see figure F.2). For drawers or runners that are equipped with any sort of built-in stop in the open position, open the drawer up to a maximum of 300 mm or fully without stressing the stop.



Dimensions in millimetres.

Figure F.2 Test for slamming shut of drawers

When closing the drawer ensure that no downwards force is exerted on the drawer or runners, i.e. having the point of application of the force either at or above the level of the runners.

Slam the drawer shut 10 times with the drawer slamming machine.

NOTE. The closing velocity produced by the machine when slamming the drawer being tested may not be the same as the calibrated closing velocities specified in table 1.

In addition, if the drawer is fitted with open stops carry out the slam open test, recalibrating the machine as described in annex M. Close the drawer to a position 300 mm from the fully open position (or fully close the drawer if the total drawer travel is less than 300 mm). Slam the drawer open. Carry out the test 10 times with the drawer slamming machine. During the test, measure the force required to move the drawer and the force required to maintain movement.

F.3 Test for displacement of bottom surface of drawers

F.3.1 ***Apparatus***

F.3.1.1 *Loads*, as specified in **A.1.1.1**.

F.3.2 ***Procedure***

Inspect the drawer before the test.

Load all parts intended for storage purposes, except the drawer undergoing test, with the appropriate load given in table A.2.

Place the drawer undergoing test on its runners and load with the appropriate mass given in table A.3. Apply the appropriate forces of the magnitude given in table 1, approximately 25 mm above the bottom of the drawer at the middle of the front and back of the drawer (see figure F.3). Apply the forces 10 times, rearranging the load in the drawer after each cycle.

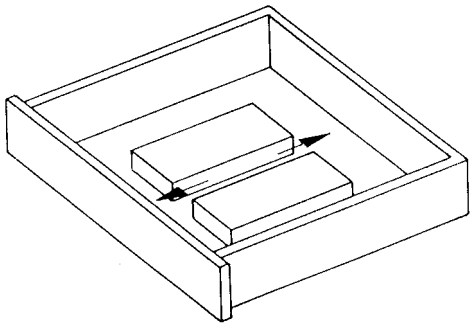


Figure F.3 Test for displacement of bottom surface of drawers

F.4 Test for wear and fatigue of drawers and runners

F.4.1 ***Apparatus***

F.4.1.1 *Loads*, as specified in **A.1.1.1**.

F.4.2 ***Procedure***

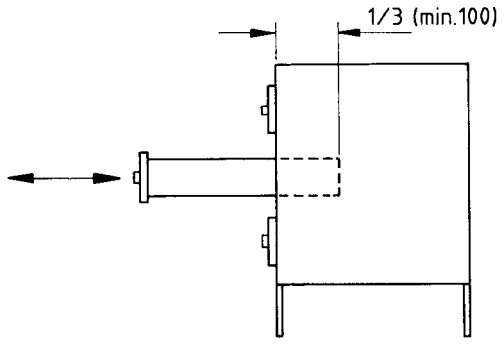
Inspect the drawers and runners before the test.

Load all parts intended for storage purposes, except for the drawer undergoing test, with the appropriate load as given in table A.2.

Load the drawer undergoing test with the appropriate mass given in table A.3.

Open the drawer from the fully closed position to the point at which one-third of the inside length (depth) of the drawer, or at least 100 mm remains in the carcase (see figure F.4). For drawers on runners that are equipped with any sort of built-in stop in the open position open the drawer fully without stressing the stops. When closing the drawer ensure that no downwards force is exerted on the drawer or runners, i.e. having the point of application of the force either at or above the level of the runners.

Close the drawer fully and firmly, without applying vertical force, at a speed of not greater than 0.25 m/s. Carry out the test for the number of cycles given in table 1. During the test, measure the force required to move the drawer and the force required to maintain movement.



Dimension is in millimetres.

Figure F.4 Test for wear and fatigue of drawers and runners

Annex G (normative)
Strength tests for trays

G.1 Sustained load

G.1.1 ***Apparatus***

G.1.1.1 *Loads*, as described in **A.1.1.1**.

G.1.2 ***Procedure***

Place the tray undergoing test on its runners and load the tray with the appropriate mass specified in table 1. Close the tray and maintain the load for 7 days.

G.2 Vertical downward static load

G.2.1 ***Apparatus***

G.2.1.1 *Loads*, as described in **A.1.1.1**.

G.2.1.2 *Means of applying the required forces.*

G.2.2 ***Procedure***

Open the tray to the point at which one-third of the inside length of the tray or at least 100 mm remains inside the carcase, load the tray with the appropriate mass specified in table A.3. Gradually apply a downward vertical load to one corner until either the front deflects downwards 50 mm or a load of 35 kg is reached. Carry out the test 10 times.

G.3 Wear and fatigue of tray and runners

G.3.1 ***Apparatus***

G.3.1.1 *Loads*, as described in **A.1.1.1**.

G.3.1.2 *Support roller*, comprising a freely moving roller of diameter 50 mm ± 5 mm with a length exceeding the width of the tray.

G.3.1.3 *Tray operation attachment device*, consisting of a metal strip 60 mm ± 5 mm wide bent into a 'U' shape with the vertical sides each 45 mm ± 5 mm long and with the distance between them 20 mm ± 5 mm.

The device shall be mounted so that the vertical faces are maintained in the vertical plane with the underside of the horizontal section being 5 mm ± 3 mm above the top edge of the tray. The operating force shall act horizontally through a point which is 5 mm ± 3 mm above the top edge of the tray (see figure G.1).

G.3.2 ***Procedure***

Load the tray undergoing test with the appropriate mass as specified in table A.3. Load all other parts as specified in table A.2. Position the roller as specified in **G.3.1.2** so that the bottom front edge of the tray touches the top of the roller when the tray has been extended through 2/3 of its total travel. Open the tray from the fully closed position to the point at which 50 mm of the inside length (depth) remains in the carcase. Close the tray fully and firmly, without applying vertical force, at a speed of not greater than 0.25 m/s. When closing the tray ensure that no downward force is exerted on the tray or runners (i.e. having the point of application of the force either at or above the level of the runners). Carry out the test for the number of cycles specified in table 1.

Examine the tray and runners before and after the test. Measure the force required to open and close the tray before and after the test.

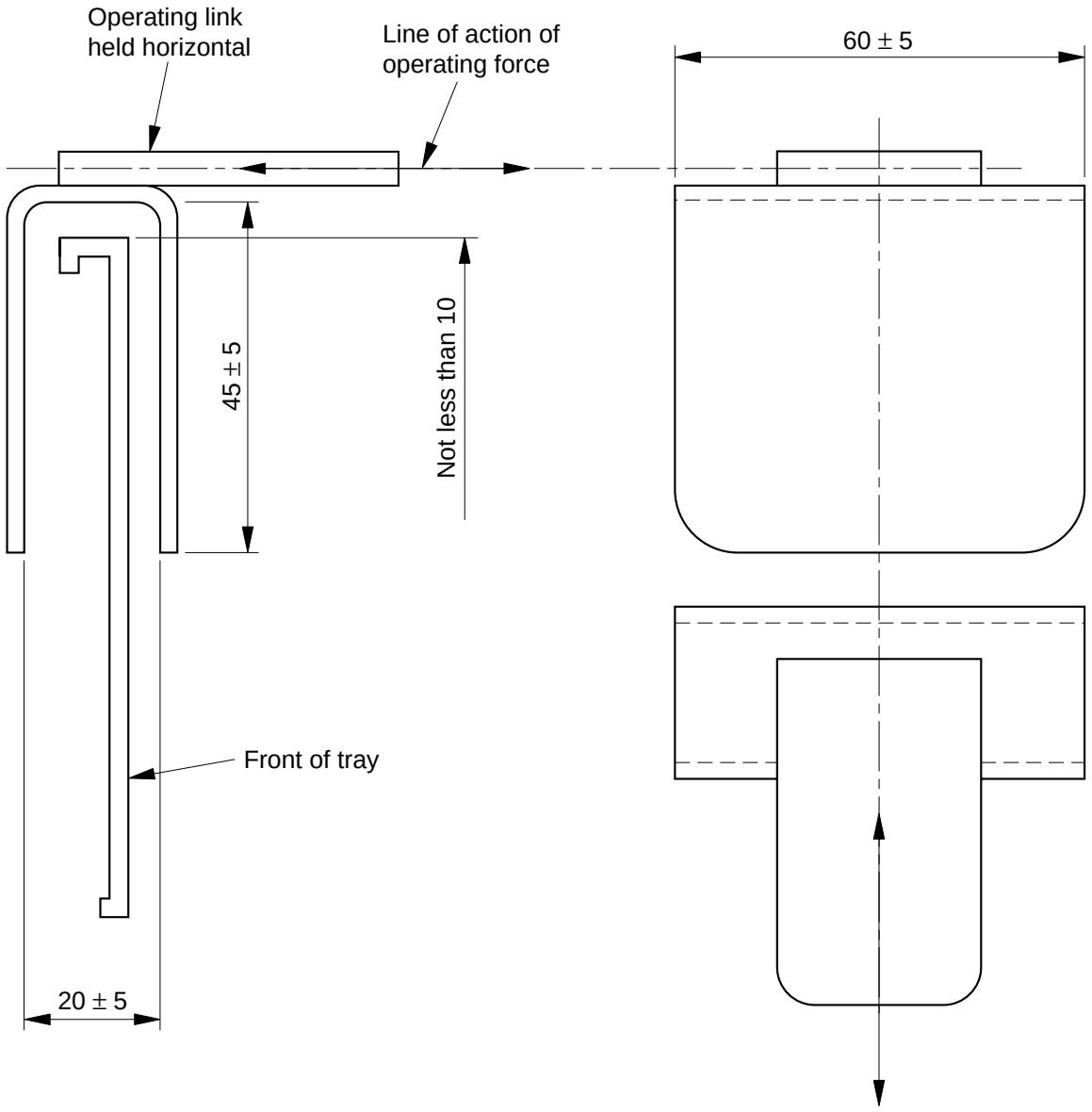
G.4 Tray drop test

G.4.1 ***Apparatus***

G.4.1.1 *Test floor*, comprising a rubber mat having a hardness of 97 IRHD when measured in accordance with BS 903 : Part A26, resting on a level concrete floor.

G.4.2 ***Procedure***

Support the tray from one corner with its bottom surface in the vertical plane and drop the tray vertically downward onto the floor (**G.4.1.1**) from a height as specified in table 1. Repeat the test for a total of 10 drops.



Dimensions in millimetres.

Figure G.1 Tray operation attachment device

Annex H (normative)
Tests on carcase and underframe

H.1 Test for strength of carcase and underframe

NOTE. This test is not applicable to wall mounted or other built-in articles.

H.1.1 ***Apparatus***

H.1.1.1 *Loads*, as described in **A.1.1.1**.

H.1.1.2 *Means of applying forces.*

H.1.1.3 *Stops*, to prevent the article from sliding but not from overturning. Stops shall be no higher than 12 mm except in cases where the design of the article necessitates the use of higher stops, where the lowest stop that will prevent the article from moving shall be used.

H.1.1.4 *Test floor*; as specified in **G.4.1.1**.

H.1.2 ***Procedure***

Place the article on the floor (**G.4.1.1**) with the legs or base on one side against stops (**H.1.1.3**). Load all parts that can be used for storage purposes with the appropriate load given in table A.2. Close drawers, flaps and roll fronts and open doors through an angle of 90°.

Apply two forces of the appropriate magnitude given in table 1 alternately along the longitudinal centrelines of the article, 50 mm from the top of the article, or at a maximum of 1600 mm above the floor. If the article tends to overturn reduce the horizontal force to a level sufficient to just prevent overturning and record the force used. Repeat the procedure on the transverse centreline of the article (see figure H.1). Carry out the test 10 times.

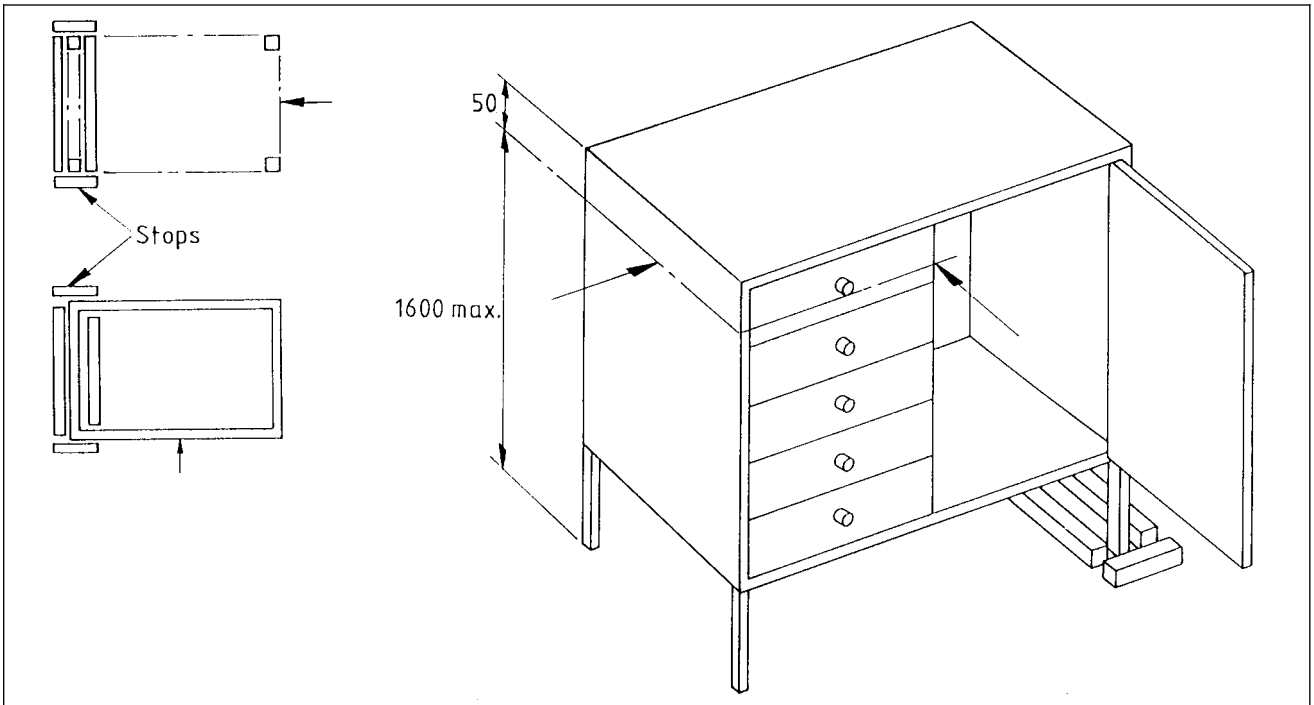
H.2 Test for strength of wall attachment devices

H.2.1 ***Apparatus***

H.2.1.1 *Loads*, as described in **A.1.1.1**.

H.2.2 ***Procedure***

Load all component parts with twice the load given in table A.3. Leave loaded for 1 week. Unload the article and inspect the wall attachment devices.



Dimensions in millimetres.

Figure H.1 Test for strength of carcase and underframe

Annex J (normative)
Strength of trolleys

J.1 Sustained load

J.1.1 *Apparatus*

J.1.1.1 *Loads*, as described in **A.1.1.1**.

J.1.2 *Procedure*

Carry out the test at 25 °C ± 5 °C. Load the trolley with three times the load specified in table A.3 for each load bearing component. Maintain the load for 7 days. Remove the load and allow the unit to recover for 24 h. Inspect the unit for any sign of failure.

J.2 Castor/wheel pin retention

J.2.1 *Apparatus*

J.2.1.1 *Weight*, 5 kg.

J.2.2 *Procedure*

Support the trolley sufficiently high off the ground to allow the 5 kg weight to be suspended from one castor/wheel. Suspend the 5 kg weight from one castor/wheel for 2 min.

J.3 Hazard fatigue

J.3.1 *Apparatus*

J.3.1.1 *Loads*, as described in **A.1.1.1**.

J.3.1.2 *Dynamic test machine*, comprising a steel surface which shall run at a mean speed of 3.22 km/h (2 mph) for a distance of 1 m over one 5 mm hazard step and one 2 mm hazard step in one direction and 1 m over one 5 mm hazard step and one 2 mm hazard step in the opposite direction.

J.3.1.3 *Hazard steps*, comprising 5 mm high and 2 mm high steps, 50 mm wide, made of steel, with the radii on the edges the same as the projection of the hazards.

J.3.2 *Procedure*

Load the trolley as specified in table A.2. Mount the trolley so that at least one castor/wheel passes over the hazard steps in such a way that the trolley is not inhibited from riding over the obstacles. The dynamic test machine (**J.3.1.2**) shall be run for periods of 2 min without pause after which there shall be a cooling period of 10 min between runs. One complete cycle comprises running 1 m in one direction followed by running 1 m in the reverse direction. Carry out the test for the number cycles specified in table 1.

J.4 Long distance running

J.4.1 *Apparatus*

J.4.1.1 *Loads*, as described in **A.1.1.1**.

J.4.1.2 *Dynamic test machine*, as specified in **J.3.1.2**.

J.4.2 *Procedure*

Load the unit as specified in table 1. Secure the unit on to the dynamic test machine (**J.3.1.2**). The unit shall be run at a mean speed of 3.22 km/h (2 mph) over the test surface without steps. The test rig shall be run for 2 min followed by a cooling off period of 10 min. Repeat the procedure for a total distance of 150 km.

J.5 Obstruction impact

J.5.1 *Apparatus*

J.5.1.1 *Loads*, as described in **A.1.1.1**.

J.5.1.2 *Dynamic test machine*, as specified in **J.3.1.2** but equipped with a means of switching off the power at the point of contact between the trolley and the obstruction.

J.5.1.3 *Obstruction*, comprising a step which the trolley under test cannot surmount, i.e. a step that is at least as high as the radius of the castor or wheel but not higher than 1.5 × the castor or wheel radius. In order to ensure that only one castor strikes the obstruction the step shall be fixed at an angle of 80° to the direction of motion of the trolley

J.5.2 *Procedure*

Load the trolley as specified in table 1. Secure the trolley lightly to the test machine (**J.5.1.2**). Run the trolley at a speed of 3.22 km/h (2 mph) into the obstruction (**J.5.1.3**). Carry out the test three times in total.

J.6 Horizontal fatigue

J.6.1 *Apparatus*

J.6.1.1 *Loads*, as described in **A.1.1.1**.

J.6.1.2 *Loading pads*, comprising two rigid cylindrical pads, 100 mm in diameter, with one flat face and a 12 mm edge radius.

J.6.2 *Procedure*

Load the trolley as specified in table A.2. Restrain the base of the unit with stops, as specified in **H.1.1.3**, in all directions.

Apply two alternating horizontal forces as specified in table 1 as near to the top surface as possible by means of the two loading pads (**J.6.1.2**) one at one end of the unit 50 mm from one corner and one at 50 mm from the opposite corner. Apply the force for the appropriate number of cycles specified in table 1.

Repeat the procedure at the other corner positions.

If the trolley tends to overturn in one direction of loading with the load specified, reduce the horizontal force to the highest value that prevents overturning. Perform the test using this reduced force in that direction only. Record the value of any reduced force used.

Annex K (normative)
Test for strength of coat hooks

K.1 Apparatus

K.1.1 *Means of applying required forces.*

K.2 Procedure

Attach the coat hooks as they are intended to be used. Subject each hook to 10 vertical applications of the appropriate force given in table 1. Apply the force to that part of the hook which extends furthest outward in the horizontal plane (dimension *A* in figure K.1), or to any position likely to cause failure. If there are several such positions apply the force 10 times to a maximum of three positions (see figure K.1).

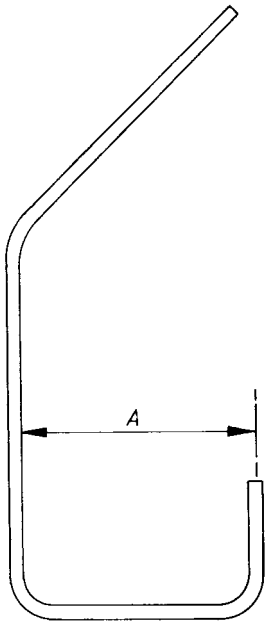


Figure K.1 Strength of hooks

If the hooks are structurally interconnected, apply the force to each hook simultaneously. In the case of hooks where the force is applied in several positions, the force shall be applied to the extra positions on one hook only.

Annex L (normative)
Stability tests

L.1 Overturning test for an unloaded carcase

L.1.1 ***Apparatus***

L.1.1.1 *Loads*, as given in table L.1.

L.1.1.2 *Stops*, as specified in **H.1.1.3**.

L.1.1.3 *Test floor*, as specified in **G.4.1.1**.

L.1.1.4 *Loading pad*, as specified in **A.3.1.2**.

L.1.1.5 *Means of applying the required forces.*

L.1.2 ***Procedure***

Carry out the test with the article placed on the floor (**L.1.1.3**) and with stops (**L.1.1.2**) placed in such a position that the article is prevented from sliding, but not from overturning, during each test.

Close all drawers and doors on the article. Load the drawer that has the longest travel with the appropriate load given in table L.1. Pull it out two-thirds of its length, or to the point at which 100 mm remains in the carcase, or if it is fitted with a built-in stop open the drawer fully without stressing the stop. Apply a downwards force of 100 N to the outer edge of the drawer by means of the loading pad (**L.1.1.4**) (see figure L.1). Observe whether the article overturns. Unload and close the drawer.

Open the pivoted door having the greatest width through an angle of 90°, or fully open the door if it is not possible to open the door through an angle of 90°. Apply a downward force of 100 N to the outer edge of the door by means of the loading pad (**L.1.1.4**) (see figure L.1). Observe whether the article overturns. Close the door.

L.2 Overturning tests for a loaded article

L.2.1 ***Apparatus***

L.2.1.1 *Loads*, as described in **A.1.1.1**.

L.2.1.2 *Stops*, as described in **H.1.1.3**.

L.2.1.3 *Test floor*, as described in **G.4.1.1**.

L.2.1.4 *Loading pad*, as described in **A.3.1.2**.

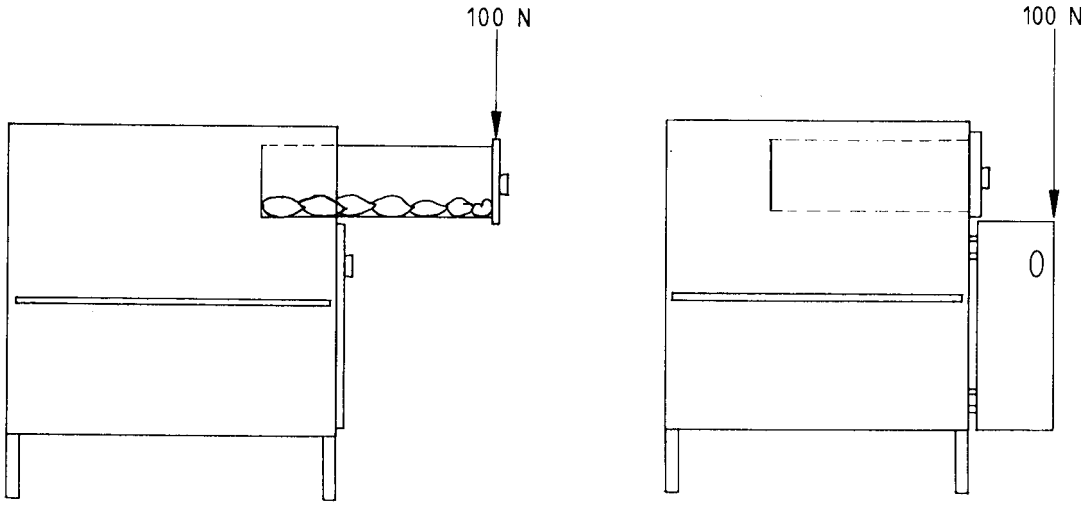
L.2.1.5 *Means of applying the required forces.*

L.2.1.6 *Horizontal impact device*, (see figure L.2), consisting of a basketball inflated to a pressure of 75 kPa $\pm$ 5 kPa and attached by a network of elastic cords to a mounting ring. The ball seating shall consist of a mounting ring of timber (or timber derivative) having an outside diameter of 150 mm and an inside diameter of 90 mm. Its rear face shall be attached to the main body of the impacter and its front face shaped to fit the ball.

The main body of the impacter shall consist of a mass supported by cords or flexible wires 850 mm long so that the longitudinal axis of the ball, mounting ring and main body assembly shall remain horizontal when the support cords are displaced from the vertical.

The main body of the impacter shall be of such a mass that the total mass of all moving parts, excluding the support cords, shall be 40 kg.

Table L.1 Loads to be applied	
Part	**Load**
Horizontal surfaces, shelves and door baskets	1.0 kg/10 000 mm^2
Drawers and extension elements (cabinet not loaded)	0.25 kg/dm^3 internal volume
Drawers and extension elements (cabinet loaded)	0.25 kg/dm^3 internal volume[1)]
Suspended pocket file fittings	1.25 kg/100 mm length
Clothes hanging rails	2.0 kg/100 mm length
Trays	0.025 kg/mm internal depth
[1)] For all tests except the drawer slam open test, in which the drawer is loaded to 0.4 kg	



a) Drawers b) Doors

Figure L.1 Overturning test on an unloaded carcase: doors and drawers

L.2.2 ***Procedure***

L.2.2.1 *General*

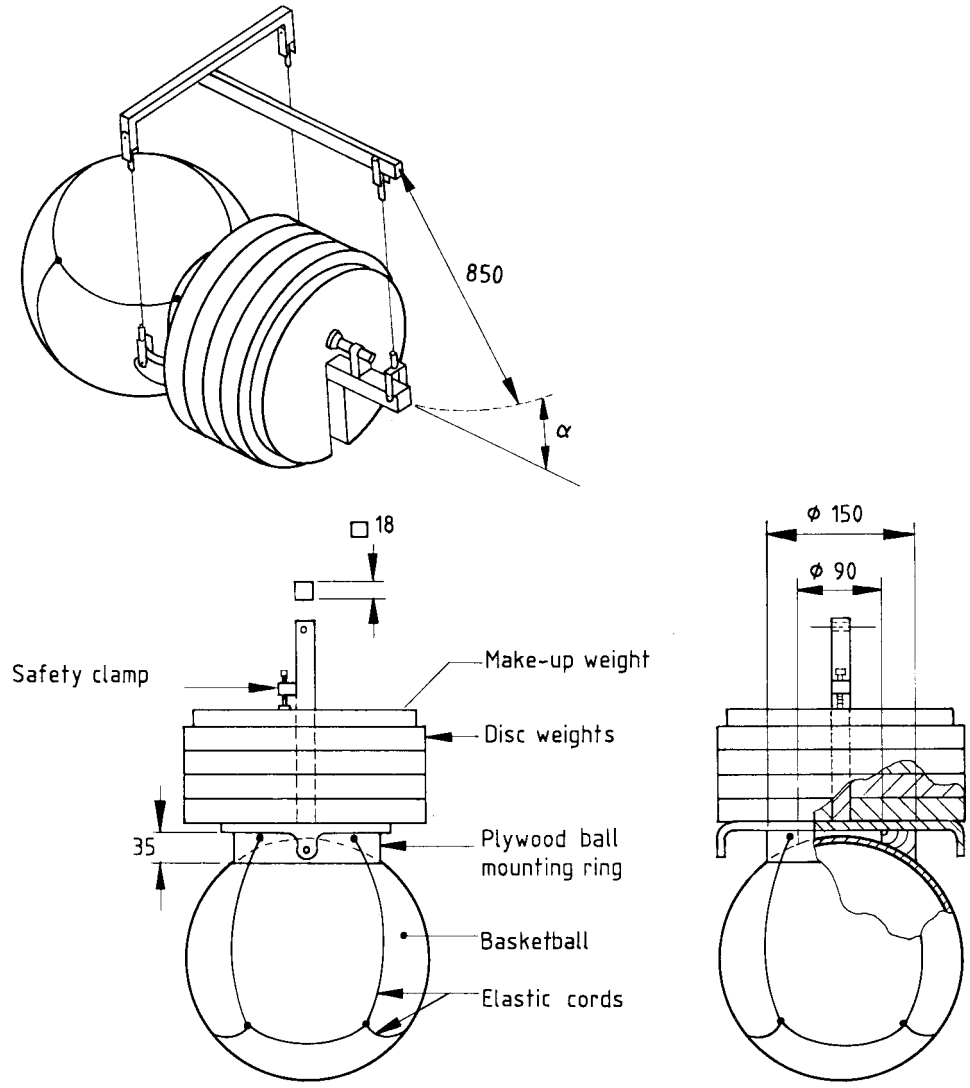
Carry out the tests described in **L.1.2** and **L.2.2.2** to **L.2.2.5** with the article placed on the floor (**L.2.1.3**) and with stops (**H.1.1.3**) placed in such a position that the article is prevented from sliding, but not from overturning, during each test. Load all parts of the article with the appropriate load given in table L.1. Close all doors and drawers.

L.2.2.2 *Doors and drawers*

Carry out the tests as described in **L.1.2** except that the downward forces applied shall be 300 N (see figure L.3).

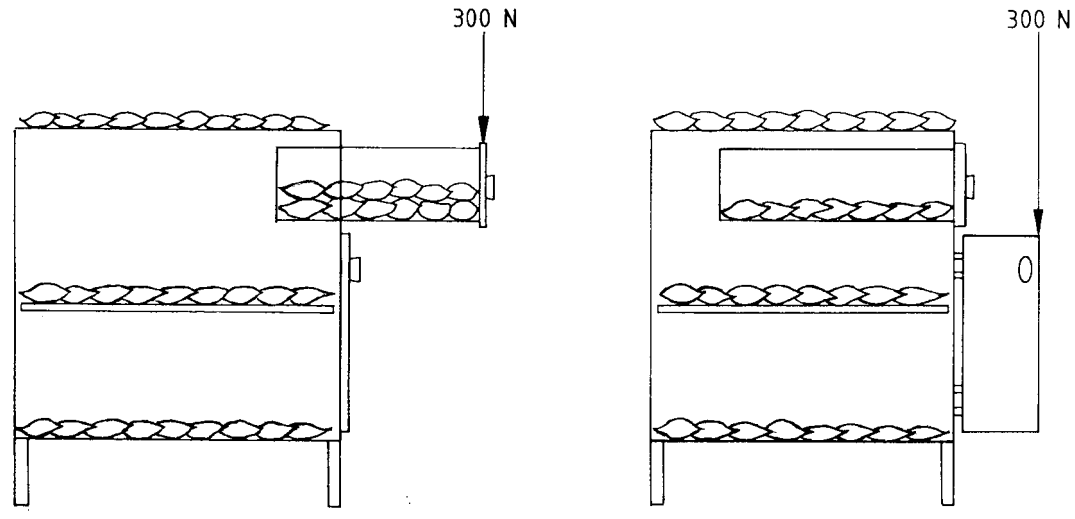
L.2.2.3 *Drawer slamming*

For drawers fitted with stops, carry out the slam open/close test and for other drawers carry out the drawer shut test described in BS 4875 : Part 8 using test level 4 as specified in BS 4875 : Part 7 : 1985 (see figure L.4). Observe whether the article overturns. Disregard any damage sustained by the drawer.



Dimensions are in millimetres.

Figure L.2 Horizontal impact device



a) Drawers b) Doors

Figure L.3 Overturning test on a loaded article: doors and drawers

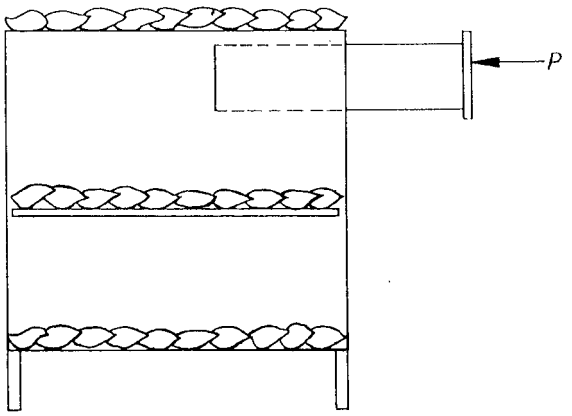


Figure L.4 Overturning test on a loaded article: drawer slamming

L.2.2.4 *Flaps*

Open the flap having the greatest depth. Apply a downwards force of 200 N to its outer edge by means of the loading pad (**L.1.1.4**) (see figure L.5). Observe whether the article overturns. Close the flap.

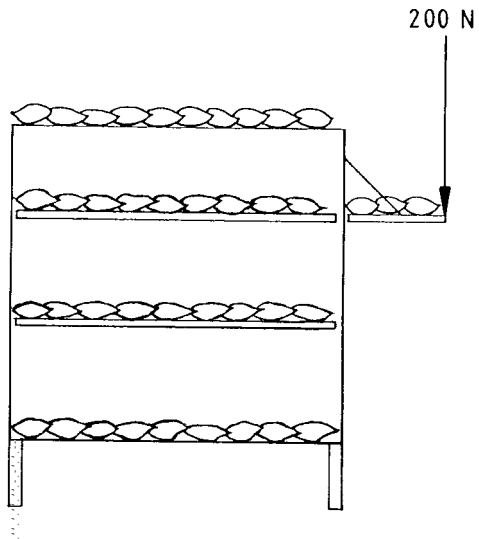


Figure L.5 Overturning test on loaded article: flaps

L.2.2.5 *Horizontal stability*

Apply a horizontal force of 200 N perpendicular to the front edge of the highest shelf, flap, drawer or top by means of the loading pad (**L.1.1.4**). Observe whether the article overturns. Repeat the test with the force applied to the rear edge, if appropriate.

The maximum height of application of the force shall be 1.6 m.

Pull on handles, if fitted, with a force of 200 N. If doors or drawers can be locked, lock them before applying the 200 N force.

L.2.2.6 *Impact test*

Place the article on the floor (**L.2.1.3**) with the stops positioned against the bottom of the legs furthest from the point of impact. Impact the article, using the impacter (**L.2.1.6**), falling through a height of 40 mm so that the impacter strikes the edge of the article at the position likely to have the most adverse effect, for instance the top edge. The maximum height of impact from the floor shall be 1.6 m. Observe whether the article overturns.

Annex M (normative)

Calibration of drawer slamming machine

Drawers have to be loaded with the loads given in table A.3 and slammed by an apparatus capable of producing the closing velocities given in table 1 to an accuracy of $\pm$ 5 %.

In order to demonstrate that the chosen apparatus meets these requirements, two standard drawers are required having a mass of 5 kg and 35 kg respectively, and exhibiting a total frictional force in the runners of not greater than 10 N. The test specified in **F.2** is then performed on these drawers using the chosen apparatus and the closing velocities produced can then be checked against the standardized closing velocities given in table 1, thus determining the suitability of the chosen apparatus.

List of references (see clause 2)

Normative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 903 :	*Physical testing of rubber*
BS 903 : Part A26 : 1995	*Method for determination of hardness (hardness between 10 IRHD and 100 IRHD)*
BS 4875 :	*Strength and stability of furniture*
BS 4875 : Part 7 : 1985	*Methods for determination of strength of storage furniture*
BS 4875 : Part 8 : 1985	*Methods for determination of stability of storage furniture*
BS 6206 : 1981	*Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings*

Informative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 5873 :	*Educational furniture*
BS 5873 : Part 5 : 1997	*Specification for security of fixed secure storage units for educational institutions*
BS EN 1153 : 1996	*Kitchen furniture — Safety requirements and test methods for built in and free standing kitchen cabinets and work tops*

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