Appendix K
(normative)

Leg strength tests

K.1 Principle

Large forces are applied a small number of times to test the strength of the legs (forwards and sideways), see Clause 6.2(i).

K.2 Apparatus

The following apparatus is required:

(a) Smaller seat loading pad.

(b) Local loading pad.

(c) Means of measuring in millimetres.

(d) Means of applying a measured force in newtons as specified in Table 6.2.

(e) Stops to prevent the chair from moving.

K.3 Procedures

K.3.1 Legs forward

The procedure shall be as follows:

(a) Prevent the chair from movement by positioning stops against the front legs. For seating with only three legs, any two feet shall be restrained by stops.

(b) Apply, and hold, the applicable vertical force specified in Table 6.2 to the smaller seat loading pad in the median plane and at the applicable distance (d) specified in Table 5.4.2 back from the front edge of the seat.

(c) Apply the applicable horizontal force specified in Table 6.2 centrally to the rear of the seat, at the height of the lowest contact point of the seat loading pad with the surface of the seat. Apply the force in a forward direction by means of the local loading pad, see Figure K.3.1. Alternatively, perform the test by a pull force at the same height from the front of the chair.

(d) Hold the horizontal force for 10 s. Repeat the procedure until the applicable number of cycles specified in Table 6.2 has been completed.

(e) Examine the chair for signs of failure.

NOTE See Figure K.3.1.

Where the chair tends to overbalance before the specified force is reached, move the loading pad towards the unrestrained legs in increments of 25 mm and repeat the test. Where, after moving the loading pad three times, the unrestrained legs do not lift and the applicable specified load has not been reached the chair fails the test. Where the rear legs do lift, but at greater than 80 % of the applicable specified load, the chair passes the test.

Where the chair tends to overbalance before the specified force is reached, record the actual force and load position used.

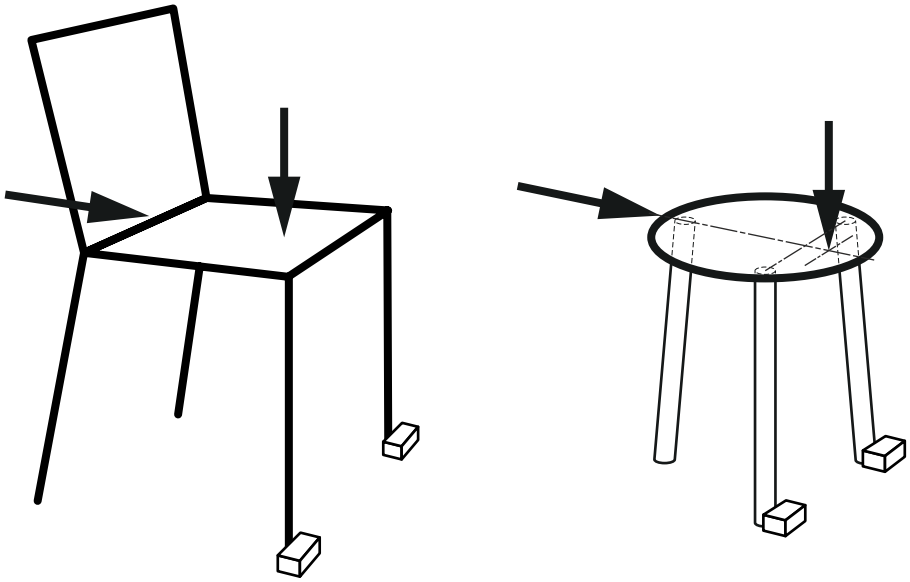

Figure K.3.1 — Example of legs forward static load test

K.3.2 Legs sideways

The procedure shall be as follows:

(a) Prevent the unit from movement by positioning stops against one pair of front and rear legs.

(b) Apply, and hold, the applicable vertical force specified in Table 6.2 to the smaller seat loading pad in line with the SLP and at the applicable distance specified in Table 5.4.2 in from the edge of the seat on the side of the restrained legs.

(c) Apply the applicable horizontal force specified in Table 6.2 to the side of the seat at the height of the lowest contact point of the seat loading pad with the surface of the seat by means of the local loading pad positioned initially in line with the vertical force and from the side opposite the restrained legs, see Figure K.3.2. Alternatively, perform the test by a pull force at the same height from the side of the chair nearest the restrained legs.

(d) Where the chair tends to twist excessively under the influence of the horizontal force, the vertical force and horizontal force may be repositioned towards either the front or rear of the chair by up to 50 mm.

(e) Hold the horizontal force for 10 s. Repeat the procedure until the applicable number of cycles specified in Table 6.2 has been completed.

(f) Examine the chair for signs of failure.

NOTE See Figure K.3.2.

Where the chair tends to overbalance before the specified force is reached, move the loading pad towards the unrestrained legs in increments of 25 mm and repeat the test. Where, after moving the loading pad three times, the unrestrained legs do not lift and the applicable specified load has not been reached the chair fails the test. Where the rear legs do lift but at greater than 80 % of the applicable specified load the chair passes the test.

Where the chair tends to overbalance before the specified force is reached, record the actual force and load position used.

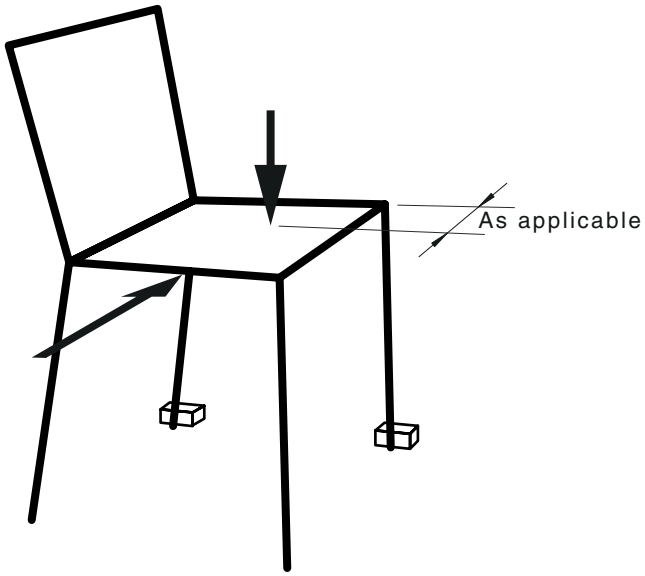

Figure K.3.2 — Example of legs sideways static load test

K.4 Test report

See Clause 2.3 for test report requirements.

Appendix L
(normative)

Vertical seat impact test

L.1 Principle

The seat is subject to impact to evaluate its strength and toughness.

L.2 Apparatus

The following apparatus is required:

An impactor as shown in Figure L.2 comprised of the following elements:

(a) *Circular body* — The circular body is 200 mm in diameter, separated from the striking surface by helical compression springs and free to move relative to it on a line perpendicular to the plane of the central area of the striking surface.

The body and associated parts minus the springs shall have a mass of (17 ± 0.1) kg and the whole apparatus, including mass, springs and striking surface, shall have a mass of (25 ± 0.1) kg.

(b) *Springs* — The springs shall be such that the nominal spring rate of the combined spring system is (7 ± 2) N/mm and the total friction resistance of the moving parts is less than 1 N. The spring system shall be compressed to an initial force of (1,040 ± 5) N (measured statically) and the amount of spring compression movement available from the initial compression point to the point where the springs become fully closed shall be not less than 60 mm.

(c) *Striking surface* — The striking surface shall be a rigid circular object, 200 mm in diameter, the face of which has a convex spherical curvature of 300 mm radius with a 12 mm front edge radius.

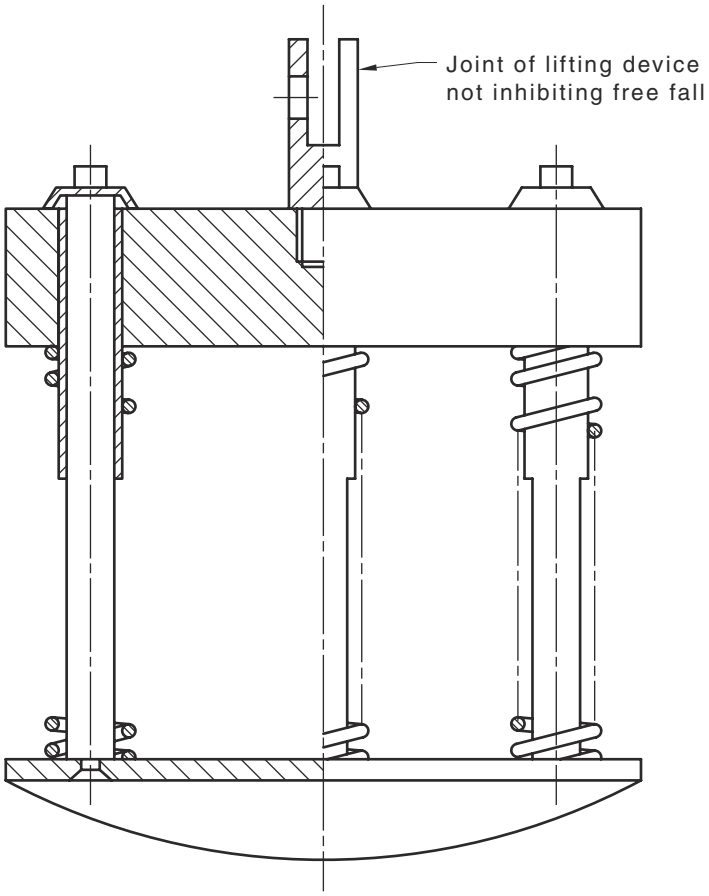

Figure L.2 — Seat impactor

L.3 Procedure

The procedure shall be as follows:

(a) Set adjustable height chairs at the midpoint of their adjustment.

(b) Place a layer of 25 mm thick foam with a density of (120 ± 25) kg/m^3 on the seat. Determine the height of fall from the position of the impactor when it is resting on the surface of the foam and at the approximate centre of the seat. Leave the foam on the surface of the seat.

(c) Drop the seat impactor the applicable number of times and from the height specified in Table 6.2. Allow it to drop freely, vertically downwards onto the surface of the seat, at the approximate centre of the seat.

(d) Repeat the test at the applicable distance (d) back from the front edge of the seat as specified in Table 5.4.2.

(e) Examine the chair for signs of failure.

NOTE See Figure L.3.

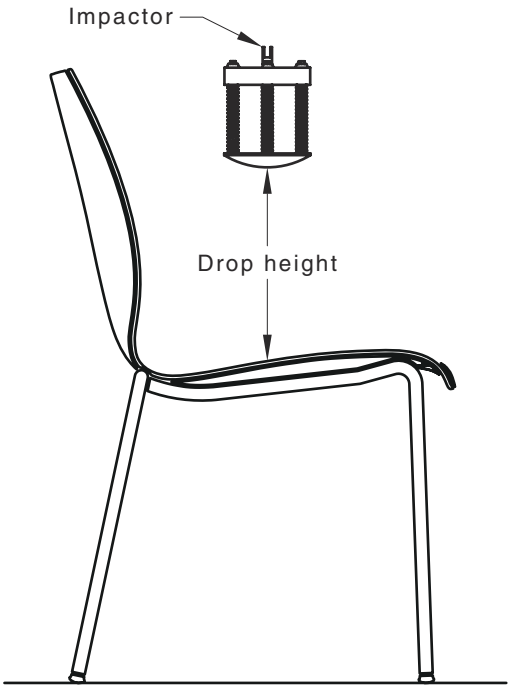

Figure L.3 — Example of seat impact test

L.4 Test report

See Clause 2.3 for test report requirements.

Appendix M
(normative)

Horizontal seat impact tests

M.1 Principle

The seat is subject to impact to evaluate its strength and toughness.

M.2 Apparatus

The following apparatus is required:

(a) An impact hammer consisting of a striker in the form of a cylinder having a mass of 6.5 kg, supported from a pivot by a steel tube 38 mm in diameter with a wall thickness of 2 mm and having a mass of 2.0 kg. The distance between the pivot and centre of gravity of the striker is 1 m. The pendulum arm is pivoted by a low friction bearing, see Figure M.2.

(b) Stops, to prevent the chair from movement.

(c) Rigid, horizontal and flat floor.

(d) Foam mat or similar to prevent damage from impact with the floor.

(e) Means of measuring in millimetres.

(f) Means of measuring angles in degrees.

Dimensions in millimetres

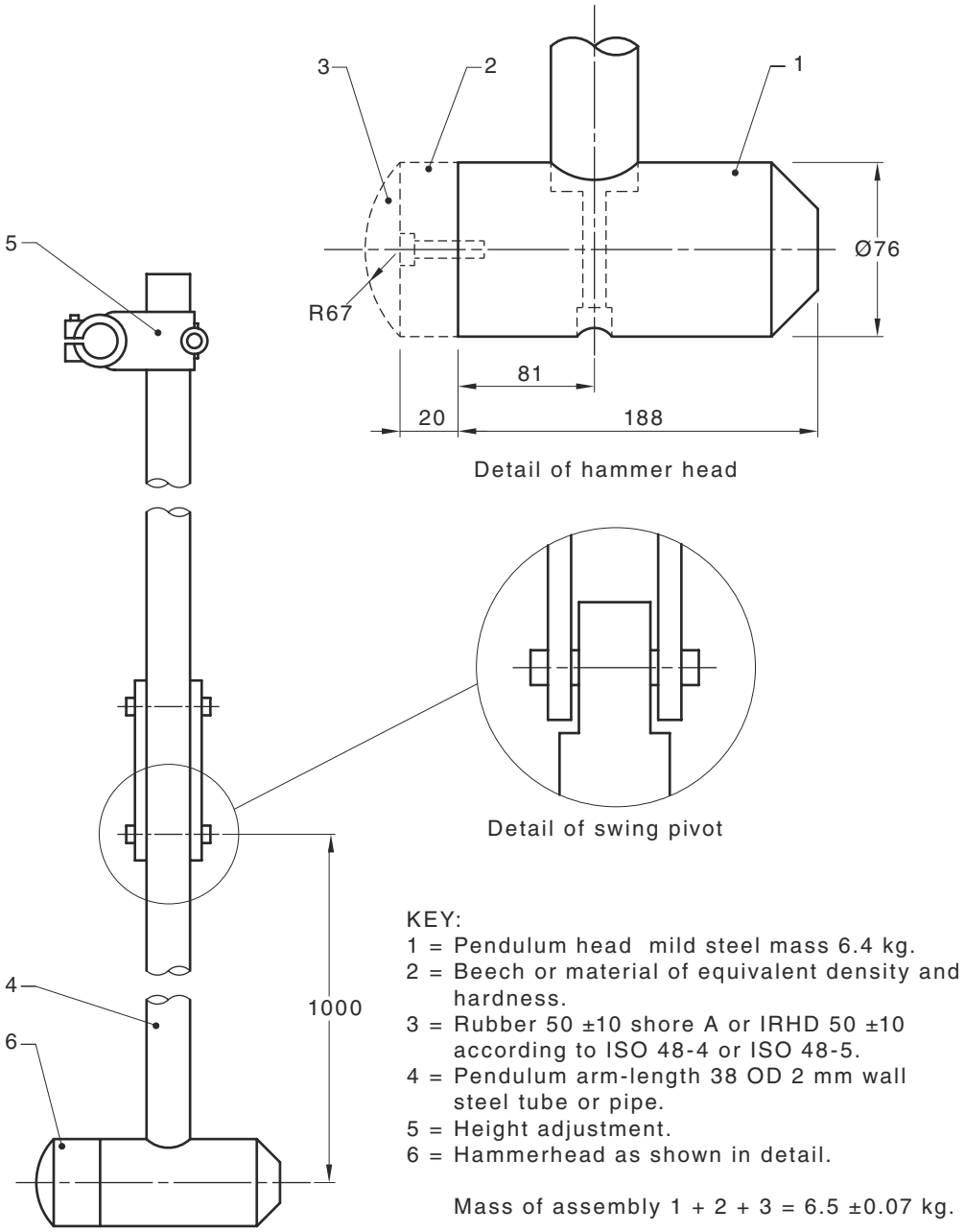

Figure M.2 — Impact hammer

M.3 Procedures

M.3.1 Impact to front edge of seat

The procedure shall be as follows:

(a) Prevent the chair from rearwards movement by the use of stops placed behind the rear legs.

(b) Place the foam mat in a position to catch the fall of the chair when impacted.

(c) Allow the striker to impact the front edge of the seat centrally from the applicable angle or height specified in Table 6.2. Ensure that it impacts the chair horizontally. A stool without a back shall be impacted at two adjacent sides.

(d) Repeat the procedure until the applicable number of cycles specified in Table 6.2 has been completed.

(e) Examine the chair for signs of failure.

NOTE See Figure M.3.1.

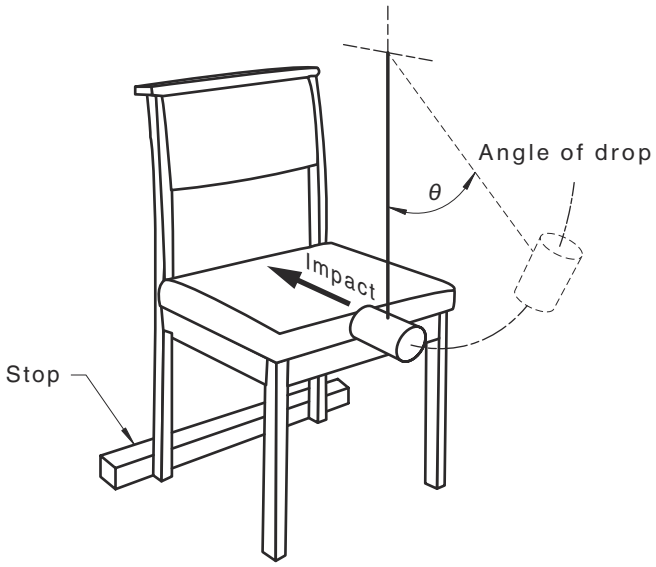

Figure M.3.1 — Example of impact to front edge of seat

M.3.2 Impact to front corner of seat

The procedure shall be as follows:

(a) Prevent the chair from rearwards movement by the use of stops placed behind the rear legs.

(b) Place the foam mat in a position to catch the fall of the chair when impacted.

(c) Allow the striker to impact the front corner of the seat from the applicable angle or height specified in Table 6.2. Ensure that it impacts the chair horizontally, see Figure M.3.2.

(d) Repeat the procedure until the applicable number of cycles specified in Table 6.2 has been completed.

(e) Examine the chair for signs of failure.

NOTE See Figure M.3.2.

Chairs that swivel shall not be prevented from rotating when impacted.

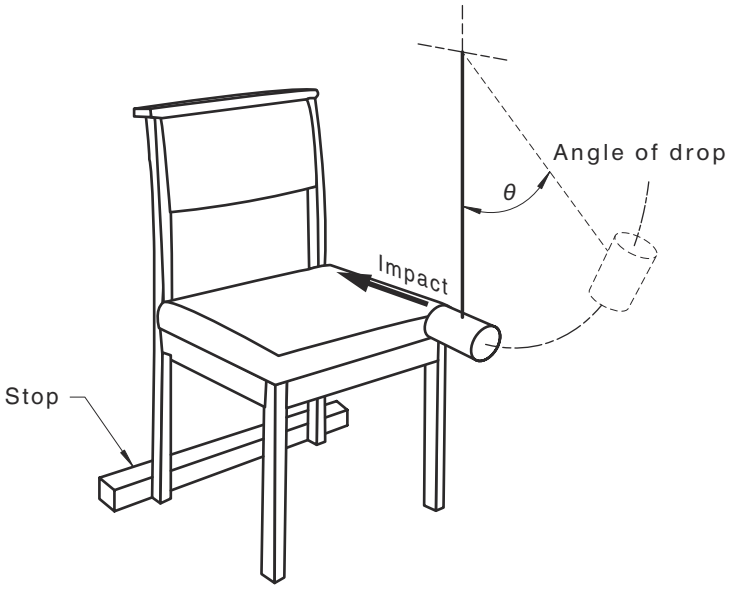

Figure M.3.2 — Impact to front corner of seat

M.4 Test report

See Clause 2.3 for test report requirements.