DEAS 1150: 2023

ICS 83.083.01





Copyright notice

This EAC document is copyright-protected by EAC. While the reproduction of this document by participants in the EAC standards development process is permitted without prior permission from EAC, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from EAC.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to EAC's member body in the country of the requester:

© East African Community 2023 — All rights reserved East African Community P.O. Box 1096, Arusha Tanzania Tel: + 255 27 2162100 Fax: + 255 27 2162190 E-mail: <u>eac@eachq.org</u> Web: www.eac-quality.net

0:20

FA

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement. Violators may be prosecuted.

23605

Contents

Page

IOIEWC	Forewordvi				
1	Scope1				
2	Normative references1				
3	Terms and definitions1				
4 4.1 4.2 4.2.1 4.2.2 4.2.3 4.2.4 4.2.5 4.2.6 4.2.7 4.2.8 4.2.9 4.2.10 4.2.11 4.2.12 4.3 4.3.1	Requirements 2 General Requirements 2 Performance 2 Seat loading point (SLP) and back loading point (BLP) determination 2 Seat static load test 2 Back static load test 2 Arm sideways static load test 2 Arm downwards static load test 2 Back fatigue test 2 Back fatigue test 2 Back fatigue test 3 Leg forward static load test 3 Leg sideways static load test 3 Seat impact test 3 Stability 4				
4.3.2 4 4	Performance requirements				
5	Marking and labelling				
6	Test report5				
Annex A.1 A.2 A.3 A.4 A.5 A 6	A (normative) Chair inspection for damage and dimensional change				
/	Final inspection procedure				
Annex B.1 B.2 B.3 B.4 B.5	Final inspection procedure 7 Test report 8 B (Normative) Determination of seat loading point (SLP) and back loading point (BLP)9 Scope 9 Principle 9 Apparatus 9 Test conditions 10 Procedure 10				
Annex B.1 B.2 B.3 B.4 B.5 Annex C.1 C.2 C.3 C.4 C.5 C.6	Final inspection procedure 7 Test report 8 B (Normative) Determination of seat loading point (SLP) and back loading point (BLP)9 Scope 9 Principle 9 Apparatus 9 Test conditions 10 Procedure 10 C (normative) Seat static load test 12 Scope 12 Principle 12 Principle 12 Test conditions 12 Procedure 12 Principle 12 Principle 12 Principle 12 Test conditions 12 Test conditions 12 Test conditions 12 Test conditions 12 Test report 13				

D.6	Test report	. 16
Annex	E (normative) Arm sideways static load test	. 17
E.1	Scope	. 17
E.2	Principle	. 17
E.3	Apparatus	. 17
E.4	Test conditions	. 17
E.5	Procedure	. 17
E.6	Test report	. 18
Annex	F (normative) Arm downwards static load test	19
F.1	Scope	. 19
F.2	Principle	. 19
F.3	Apparatus	. 19
F.4	Test conditions	. 20
F.5	Procedure	. 20
F.6	Test report	. 20
Anney	G (normative) Seat fatigue test	22
G 1	Scone	. 22 22
G.2	Principle	. 22
G.3	Apparatus	. 22
G.4	Test conditions	. 22
G.5	Procedure	. 22
G.6	Test report	. 23
Annov	H (normative) Back fatigue test	24
	Scone	. 24 21
H 2	Principle	. 24 94
H 3	Annaratus	24
H.4	Test conditions	. 24
H.5	Procedure	. 24
H.6	Test report	. 25
Annov	(normativa) Lag forward static load test	26
Annex	T(normative) Leg forward static load test	. 20 26
1.1	Principle	26
1.2	Annaratus	26
1.4	Test conditions	. 26
1.5	Procedure	. 26
1.6	Test report	. 27
A	I (nonmative) I an accurate land test	20
Annex	J (normative) Leg rearward static load test	. 2ð 20
J.1 12	Scope	. 20 29
J.Z 3	Annaratus	. 20 28
.14	Test conditions	28
J.5	Procedure	. 28
J.6	Test report	. 29
Annex	K (normative) Leg sideways static load test	. 30
K.1	Scope	. 30
N.2 K 2	Apparetus	. 30
п.э К /	Apparatus Test conditions	. 30 30
K 5	Procedure	30
K.6	Test report	. 31
Annex	L (normative) Seat impact test	. 32
L.1	Scope	. 32
L.2		. 32
L.3	Apparatus	. 32
L.4	lest conditions	. 33
L.3	Froceaure	. 33

L.6	Test report	34
Annex	M (normative) Drop test	35
M.1	Scope	35
M.2	Principle	35
M.3	Apparatus	35
M.4	Test conditions	35
M.5	Procedure	35
M.6	Test report	36
A	· · · · · · · · · · · · · · · · · · ·	07
Annex	N (normative) Rearward overturning	37
N.1		
N.Z		
N.3	Apparatus	
IN.4	Test conditions	
C.NI	Toct roport	
N.0		
Annex	C (normative) Frontward overturning	39
0.1	Scope	39
0.2	Principle	39
0.3	Apparatus	39
0.4	Test conditions	39
0.5	Procedure	39
0.6	Test report	40
Bibliog	graphy	41
_		
	50.202° FO.	
Ś		

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 072, *Plastics and related products.*

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Introduction

This East African Standard allows for two levels of performance based on the end use of the chair, domestic or commercial. The forces used are sufficient to apply to chairs intended for adult use and also to ensure that a chair meets the minimum requirements in its intended environment, but do not ensure that failure will not eventually occur either as a result of habitual misuse or after three years of service.

With the exception of the seat and back loading point determination and the seat impact test, test results are dependent on the loads being correctly applied, therefore for the remaining tests, apparatus equivalent to that listed may be used. In the case of designs not catered for in the test procedures, the test should be carried out as closely as possible to that described and deviations from the test procedure noted on the test report.

The strength and durability of the chair are determined by the application of static, impact and fatigue tests. The forces used are sufficient to allow for normal functional use. Strength and durability are detailed in Clause 4. The stability of the chair is determined by both the application of impact forces and by applying loads that could normally be encountered. Stability is detailed in Clause 5 and by tilting the chair to simulate normal functional use. The tests provide a procedure that will allow comparative analysis of the stability of various chairs under relatively fixed conditions. Chair stability is related to personal sitting habits, chair style, use conditions, floor finish and condition as well as design of the chair legs, which are variables complicating the fixing of minimum requirements. The minimum acceptance level is based on the weight and style of chair for both forwards and rearwards overturning

forf

Plastic monobloc chair — Specification

1 Scope

This Draft East African Standard specifies requirements and test methods for the evaluation and selection of plastic monobloc chairs for adults.

This standard does not cover chairs intended for children and bathroom use.

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 2439, Flexible cellular polymer materials — Determination of hardness (indentation technique)

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 <u>http://www.iso.org/obp</u>

3.1

commercial

any item used in other than domestic premises

3.2

domestic

any item used in the home, whether it is for indoor or outdoor use

4.3

impact tests

tests to assess the strength of the chair under the rapid rates of loading that only occasionally occur

3.4

strength and durability tests

tests simulating the repeated cyclic loading of the chair occurring during long-term use and assessing the strength of the chair under such conditions.

4 Requirements

4.1 General Requirements

4.1.1 When examined visually the chair shall not have sharp projections, sharp edges or other features that may trap clothing or cause injury to the user and other persons moving in the vicinity of the chair.

4.1.2 At least one week, in normal indoor conditions shall have elapsed between manufacture and testing.

4.1.3 The chair shall be measured and inspected in accordance with A.4, Annex A.

4.2 Performance

The tests and determinations specified in 4.2.1 to 4.2.12 shall be performed in sequence and on the same chair until failure occurs.

4.2.1 Seat loading point (SLP) and back loading point (BLP) determination

The SLP and BLP shall be determined in accordance with Annex B.

4.2.2 Seat static load test

When tested in accordance with Annex C and with the force specified for the relevant test level in Table 1, the chair shall not break or show distortion in excess of that specified in 4.4.

4.2.3 Back static load test

When tested in accordance with Annex D and with the force specified for the relevant test level in Table 1, the chair shall not break or show distortion in excess of that specified in 4.4 The chair back-dimension 'Y' shall not increase by more than 10 % under the applied load (see Figure A.3).

4.2.4 Arm sideways static load test

When tested in accordance with Annex E and with the force specified for the relevant test level in Table 1, the chair arms shall remain intact and not break or show distortion in excess of that specified in 4.4.

4.2.5 Arm downwards static load test

When tested in accordance with Annex F and with the force specified for the relevant test level in Table 1, the chair arms shall remain intact and not break or show distortion in excess of that specified in 4.4. The deflection of the arms under the applied load shall not exceed the following:

- a) 100 mm or 40 % of the arm height measured above the seat in the case of domestic level; and
- b) 80 mm or 32 % of the arm height measured above the seat (whichever is the smaller) in the case of commercial level.

4.2.6 Seat fatigue test

When tested in accordance with Annex G and for the number of cycles specified for the relevant test level in Table 1, the seat of the chair shall not break or show distortion in excess of that specified in 4.4.

4.2.7 Back fatigue test

When tested in accordance with Annex H and for the number of cycles specified for the relevant test level in Table 1, the back of the chair shall not break or show distortion in excess of that specified in 4.4.

4.2.8 Leg forward static load test

When tested in accordance with Annex I and with the load specified for the relevant test level in Table 1, the front legs of the chair shall not break or show distortion in excess of that specified in 4.4.

4.2.9 Leg rearward static load test

When tested in accordance with Annex J and with the load specified for the relevant test level in Table 1, the rear legs of the chair shall not break or show distortion in excess of that specified in 4.4.

4.2.10 Leg sideways static load test

When tested in accordance with Annex K and with the load specified for the relevant test level in Table 1 the two legs supporting the chair shall not break.

4.2.11 Seat impact test

When tested in accordance with Annex L and impacted from the height specified for the relevant test level in Table 1, the seat of the chair shall not break.

4.2.12 Drop test

When tested in accordance with Annex M and dropped from the height specified for the relevant test level in Table 1, the chair shall not break.

Test			Loading ^a	Test Levels	
Clause	Strength and durability			Domestic	Commercial
4.2.2	Seat static load ^b	Can be combined	Force N	1600	2000
	(Number of times at each two locations	10	10
4.2.3	Back static load ^b	•	Force, N	560	760
	Balancing load		Force, N	1600	2000
	N'S		Number of times	10	10
4.2.4	Am sideways static I	oad ^b	Force, N	600	900
			Number of times	10	10
4.2.5	Arm downward station	c load ^b	Force, N	1800	2000
			Number of times (both arms)	10	10
4.2.6	Seat fatigue ^c	To be combined	Cycles	100 000	200 000
$\langle \rangle$			Seat load, N	950	950
4.2.7	Back fatigue ^c		Cycles	100 000	200 000
	Balancing load		Back load, N	330	330
			Seat load, N	950	950
4.2.8 and 4.2.9	Leg forward and rearward static load ^b		Seat load, N	1250	1800
			Number of times	10	10
4.2.10	10 Leg sideways static load ^b		Seat load, N	1250	1800
			Lift height,mm	≥150	≥150

Table 1 – Testing requirements for strength, durability and stability

		Number of times	10	10	
4.2.11	Seat impact	Impactor weight, kg	25	25	
		Drop height, mm	240	300	
		Number of times at each of two locations	10	10	
4.2.12	Drop test	Height, mm	1 000	1 500	
		Angle, degrees	10	10	
		Number of times	10	10	
Stability					
4.3.2.1	Rearward overturning	Force, N	≥156	≥156	
4.3.2.2	Frontward overturning	%of total chair weight	≥40	≥40	
^a Tolerances shall be within ± 5.0 % for all forces, ± 5.0 % for all masses and ±1.0 mm for all dimensions.					
^b The forces in static load shall be applied sufficiently slowly to ensure that negligible dynamic load is applied. It is recommended that static load tests be carried out at a maximum rate of six times per min.					

^c The forces in durability tests shall be applied sufficiently slowly to ensure kinetic heating does not occur.

NOTE Severity of loading may be varied by the number of applications or the magnitude of the loads applied.

4.3 Stability

4.3.1 General

The tests specified in 4.3.2.1, 4.3.2.2 and 4.4 shall be performed in sequence and on the same chair as tested in 4.2.

4.3.2 Performance requirements

4.3.2.1 Rearward overturning

When tested in accordance with Annex N, the front legs shall not leave the floor.

4.3.2.2 Frontward overturning

When tested in accordance with Annex O, the rear legs shall not leave the floor.

4.4 Final inspection

When all tests have been completed in accordance with Annex B to O, and inspected in accordance with A.5, Annex A, the chair shall

- a) be in accordance with 4.1.1 in general appearance and function;
- b) be free of cracks, injurious defects or fractures;
- c) not have excess distortion that will affect the further use of the chair; and
- d) not show any dimensional increase in any of the six leg-to-leg dimensions, dimension' X' or dimension 'Y' greater than 5 %.

5 Marking and labelling

5.1 The plastic monobloc chair shall be legibly and indelibly marked in English and/ or any other official language (French, Kiswahili, etc.) used in the importing East African Partner State with the following information:

- a) manufacturer's name or trade mark;
- b) code of resin identification and symbol for recycling in accordance with EAS 1086; and
- c) country of origin.

5.2 The plastic monobloc chair shall be legibly and indelibly labelled in English and/or any other official language (French, Kiswahili, etc.) used in the importing East African Partner State with the following information:

- a) name and physical address of manufacturer;
- b) that the chair is not suitable for shower or bathroom use;
- c) name of the product as, "Plastic monobloc chair";
- d) intended use of the chair, either domestic or commercial;
- e) for domestic chairs, the following statement, "Not for commercial use
- f) batch or code number; and
- g) month and year of manufacture.

6 Test report

Test reports when requited, shall be reproduced in full, be provided on request and shall include the information listed in the 'Test Report' in Annexes A to O.

NOTE Manufacturers making a statement of compliance with this East African Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

Annex A

(normative)

Chair inspection for damage and dimensional change

A.1 Scope

This annex sets out a method for determining the change in dimensions of the chair resulting from exposure to the test methods below.

A.2 Principle

The chair is measured both before and after the completion of the test procedure in order to determine if any permanent dimensional changes have occurred that will affect the further use of the chair

A.3 Apparatus

A means of measuring in millimetres

A.4 Initial inspection procedure

A.4.1 Immediately before commencement of testing, inspect each chair thoroughly, also ensuring that the surfaces of the underside of the feet are free from foreign matter.

A.4.2 Carry out a dimensional check of the unloaded chair in any situation where it can be expected to suffer deformation as a result of testing.

A.4.3 Secord the leg spread dimensions, that is, the distance between the legs in six directions, front, back, two side and two diagonal dimensions at their lowest point, (see Figure A.1).



Figure A.1 – Leg spread dimensions

A.4.4 Record the arm spread assessment, that is, the distance in mm between the arms at the widest point dimension 'X' (see Figure A.2).



Figure A.2 – Arm spread assessment – Dimension 'X

A.4.5 Record the distance in millimetres between the top edge of the back of the chair and the front edge of the seat-dimension 'Y' (see Figure A.3).





Figure A3 – Back deformation assessment – Dimension 'Y'

A.5 Final inspection procedure

A.5.1 Within 12 h to 24 h after completion of the tests, re-inspect the chair thoroughly.

Silen

A.5.2 Note any apparent defects and determine any changes that have taken place since the initial inspection (refer to Clause 4 for defects that constitute a fail).

A.5.3 Record the distance between the legs in millimetres in six directions as in A.4 (c).

A.5.4 Record the distance in millimetres between the arms at the widest point-dimension 'X' as in A.4 (d).

A.5.5 Record the distance in millimetres between the top edge of the back of the chair and the front edge of the seat-dimension 'Y' as in A.4 (e).

A.6 Test report

The following information shall be reported:

- a) whether the chair showed any defects at the time of the initial inspection;
- b) whether the chair showed any cracks, injurious defects or fractures at the time of final inspection;
- c) whether the chair showed any distortion that may affect the further use of the chair; and
- d) whether there was any leg spread, that is, if dimensional increase in the six leg-to-leg dimensions had increased by greater than 5 %
- e) whether there was any arm spread, that is, if dimension 'X' had increased by greater than 5 %;
- f) whether there was any back deformation, that is, if dimension 'Y' had increased by greater than 5 %;
- g) relevant data to indicate the chair being tested;
- h) colour and mould number of the chair being tested;
- i) intended use as marked on the chair, domestic or commercial;
- j) level to which the chair was tested;
- k) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it; and
- I) date of test.

Annex B

(Normative)

Determination of seat loading point (SLP) and back loading point (BLP)

B.1 Scope

This Annex sets out the method for determining the SLP and BLP.

NOTE There are no compliance requirements but these results should be necessary for the determination of static load test and fatigue load test.

B.2 Principle

The correct seat loading and back loading points are established using the loading point template.

B.3 Apparatus

B.3.1 20 kg mass

B.3.2 Loading point template (see Figures B.1 and B.2) comprising two shaped members fastened together by a pivot at one end. The contours of the shaped surfaces are devised so that they follow the form or shape of the chair under moderate loads. For this purpose the seat-loading arm shall have a total mass of 20 kg applied through the SLP. The apparatus is marked as shown in Figure B.2 so the template can be positioned easily with the two members at an angle of 90° to each other.





Figure B.1 – Position of chair loading point template



B.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

B.5 Procedure

B.5.1 Position the template with its load applied at the SLP on the centre-line of the seat as far towards the rear of the seat as possible with the 20 kg mass in place.

B.5.2 Adjust the template position by pushing the back loading portion into the back, so levering the seat portion forwards until the shape of the template correlates to that of the seat (see Figure B.1).

B.5.3 Mark the required loading positions from the template.

EAS 160:2023 FOR PUBLIC REVIEW

Annex C

(normative)

Seat static load test

Since one position of the seat-loading pad in the seat static load test is the same for the back static load test, it is normally convenient to perform these two tests together as a combined seat and back static load test. In this case, the seat load should be applied first and then maintained while the back load is applied. The seat loading apparatus should not hinder the rearward horizontal movement of the chair back when the back load is applied.

C.1 Scope

This Annex sets put a method for testing the integrity of a chair seat when subjected to a static load.

NOTE 4.2.2 specifies the compliance requirements.

C.2 Principle

A specified vertical force is applied to the seat of the chair to ensure the chair has sufficient strength.

C.3 Apparatus

C.3.1 Seat loading pad in the form of a naturalistically shaped rigid indenter or equivalent device with a hard, smooth surface or an equivalent device

- NOTE Because of its complexity, the shape is made from an existing form rather than a drawing.
- C.3.2 Means of measuring and applying a force as set out in Table 1.
- C.3.3 Means of measuring in millimetres.
- C.3.4 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface.

C.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

C.5 Procedure

C.5.1 Position the seat loading pad to conform to the seat plane, firstly at the SLP determined by the chair loading point template.

C.5.2 Apply the appropriate downward force (see Figure C.1) specified in Table 1, 10 times. During each application maintain the force for at least 10 s.

C.5.3 Position the seat loading at a point on the centre-line of the chair 100 mm inward from the front edge of the chair.

C.5.4 Apply the appropriate downward force (see Figure C.1), specified in Table 1, 10 times. During each application maintain the force for at least 10 s.



C.6 Test report

The following information shall be reported:

- a) whether the seat was broken or deformed;
- b) relevant data to indicate the chair being tested;
- c) the colour and mould number of the chair being tested;
- d) the intended use as marked on the chair, domestic or commercial; and
- e) the level to which the chair was tested.

Annex D

(normative)

Back static load test with back deformation assessment

D.1 Scope

This annex sets out a method for testing the integrity of a chair back when subjected to a static load.

NOTE 4.2.3 specifies the compliance requirements.

D.2 Principle

A specified force is applied at right angles to the back of the chair to test whether the chair back meets predefined strength requirements.

D.3 Apparatus

D.3.1 Back loading pad comprising a rigid rectangular object 200 mm high and 250 mm wide, the face of which is curved across the width of the pad with a wide cylindrical curvature of 450 mm radius and with a 12 mm radius on all front edges or equivalent device (see Figure D.1);





NOTE If it is not possible to apply the back load at the back loading position due to the construction of the chair, e.g. if the back is constructed of cross-members positioned above or below or above and below the back-loading position, a suitable panel may be used to spread the load over the back cross-members as long as this surface does not overlap the side upright members.

D.3.2 Means of measuring and applying a force as set out in Table 1.

- **D.3.3** Means of measuring in millimetres.
- D.3.4 If required, a panel to spread the load over the back cross members.
- **D.3.5** Stops, at a maximum of 40 mm high that prevent the chair from sliding but not tilting.
- **D.3.6** Means of measuring the deflection of the back.
- **D.3.7** Balancing load (see Table 1).
- D.3.8 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface.

D.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 $^{\circ}$ C ± 2 $^{\circ}$ C.

D.5 Procedure

D.5.1 Measure dimension 'Y' prior to performing the test (see Figure A.3).

D.5.2 Position the centre of the back loading pad either at the BLP as specified by the chair loading point template (see Figure B.2) or at a position 100 mm below the top of the back, whichever is the lower. Prevent the chair from moving rearwards by placing stops behind the rear feet (see Figure D.2).





Figure D.2 — Back static load test

D.5.3 Apply the test load of the appropriate magnitude specified in Table 1 perpendicular to the back when under load.

D.5.4 Apply the load 10 times, with the balancing seat load specified in Table 1 applied at the SLP (see Annex B). During each application, maintain the load for at least 10 s.

D.5.5 The back static force shall be of the appropriate magnitude specified in Table 1. If the chair tends to overbalance at this force, the force applied to the seat shall be increased until this tendency ceases.

D.5.6 On the tenth application of the back static load, measure dimension 'Y' (see Figure A.3).

D.5.7 Calculate the back deformation by comparing the measurement of dimension 'Y' in (a) to that in (f).

D.6 Test report

The following information shall be reported:

- a) whether the back was visibly broken or deformed;
- b) the back deformation assessment 'Y';
- c) relevant data to indicate the chair being tested;
- d) the colour and mould number of the chair being tested;
- e) the intended use as marked on the chair-domestic or commercial;
- f) the level to which the chair was tested;
- g) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it;
- h) the date of test;
- i) the name, address and qualifications of the test facility; and
- j) the authority or qualification of the signatory.

evilen

Annex E

(normative)

Arm sideways static load test

E.1 Scope

This annex sets out a method for testing the integrity of the chair arms to an outward horizontal force.

E.2 Principle

A specified horizontal force is applied to the arms to ensure they do not break or flex unduly under strain.

E.3 Apparatus

E.3.1 Two local loading pads, each one an object 100 mm in diameter, with a flat face and a 12 mm radius on the front edge or equivalent device.

NOTE All loading pads should be capable of pivoting in relation to the direction of the applied force.

E.3.2 Means of measuring and applying a force as set out in Table 1.

E.3.3 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface.

E.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

E.5 Procedure

E.5.1 Using the local loading pads apply a pair of outward forces of the appropriate magnitude specified in Table 1 between the arms of the chair at the point along the arms most likely to cause failure (see Figure E.1).



Figure E.1 — Arm sideways static load test

E.5.2 Apply the forces 10 times, during each application and maintain the load for at least 10 s. If the chair has wings (that is, two side pieces at the top of an armchair against which the head may, be rested), repeat the test on both wings with the appropriate force specified in Table 1.

E.6 Test report

The following information shall be reported:

- a) whether the chair arms were broken or deformed;
- b) relevant data to indicate the chair being tested;
- c) the colour and mould number of the chair being tested;
- d) the intended use as marked on the chair either domestic or commercial;
- e) the level to which the chair was tested;
- f) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it;
- g) the date of test;
- h) the name, address and qualifications of the test facility; and

the authority or qualification of the signatory.

review

Annex F

(normative)

Arm downwards static load test

F.1 Scope

This annex sets out a method for testing the integrity of the chair arms when subjected to a downward force.

NOTE 4.2.5 specifies the compliance requirements.

F.2 Principle

A specified vertical force is applied to the arms of the chair to ensure they have sufficient strength.

F.3 Apparatus

F.3.1 Loading pad in the form of a section of a cylinder with a radius of 300 mm, as shown in Figure F.1, applied in the test with the axis of rotation of the cylinder oriented transversely across the arms.



Figure F1 – Arm downward loading pad

- F.3.2 Means of measuring and applying a force as set out in Table 1.
- **F.3.3** Stops at a maximum of 40 mm high to prevent the chair from sliding but not tilting.
- F.3.4 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface.

F.4 Test conditions

Immediately, before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

F.5 Procedure

F.5.1 Mark the points on the arms where the test load is to be applied and measure the height(s) of the point(s) above the seat surface.

F.5.2 Using the loading pad, apply a vertical force of the appropriate magnitude specified in Table 1 at the point on the arms most likely to cause failure (see Figure F.2).



Figure F.2 — Arm downward static load test

F.5.3 Apply the force 10 times maintaining the load for a least 10 s each time.

F.5.4 Measure the height of the arms above the seat surface while the load is applied on the first and tenth application of the load.

F.6 Test report

The following information shall be reported:

- a) whether the chair arms were broken or deformed;
- b) relevant data to indicate the chair being tested;
- c) the colour and mould number of the chair being tested;
- d) the intended use as marked on the chair either domestic or commercial;
- e) the level to which the chair was tested;
- f) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it;
- g) the date of test;
- h) the name, address and qualifications of the test facility; and

i) the authority or qualification of the signatory.

EAS 150.2023 FOR PUBLIC REVIEW

Annex G

(normative)

Seat fatigue test

G.1 Scope

This Annex sets out a method for testing the durability of the chair seat.

NOTE1 4.2.6 specifies the compliance requirements.

NOTE 2 Because the number of cycles and the seat load are common to both the seat and back fatigue tests, these tests should be carried out simultaneously with the seat load being applied first and then maintained while the back load is applied. The seat loading apparatus should not hinder the rearward horizontal movement of the chair when the back load is applied.

G.2 Principle

A specified vertical force is repeatedly applied to the seat to test the durability of the chair.

G.3 Apparatus

G.3.1 Seat loading pad in the form of a naturalistically shaped rigid indenter with a hard smooth surface or an equivalent device (see Figure C.1).

G.3.2 Means of measuring and applying the force specified in Table 1.

G.3.3 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface.

G.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

G.5 Procedure

G.5.1 Apply the force by means of the seat loading pad with the centre of the pad positioned at the SLP determined as per Annex B.

G.5.2 Apply for the number of times specified in Table 1 at a rate not exceeding 40 cycles per min (see Figure G.1).



Figure G.1 — Seat fatigue test

G.6 Test report

The following information shall be reported:

- a) whether the seat of the chair was broken or deformed;
- b) relevant data to indicate the chair being tested;
- c) the colour and mould number of the chair being tested;
- the intended use as marked on the chair, domestic or commercial; d)
- the level to which the chair was tested; e)
- details of any deviations from this test, including data relevant to the chair design if this test does not f) cater for it;
- the date of test; g)
- the name, address and qualifications of the test facility; and h)
- the authority or qualification of the signatory. i)

Annex H

(normative)

Back fatigue test

H.1 Scope

This annex sets out a method for testing durability of the chair back.

H.2 Principle

A specified horizontal force is applied to the chair to ensure it does not deform.

H.3 Apparatus

H.3.1 Back loading pad comprising a rigid rectangular object 200 mm high and 250 mm wide, the face of which is curved across the width of the pad with a convex cylindrical curvature of 450 mm radius and with a 12 mm radius on all front edges or equivalent device (see Figure D.1).

NOTE If it is not possible to apply the back load at the loading position due to the construction of chair, for example, if the back is constructed of cross-members positioned above, below, or above and below the back loading position, a suitable panel may be used to spread the load over the back cross-members as long as this surface does not overlap the side upright members.

- H.3.2 Means of measuring in millimetres
- H.3.3 Stops, at a maximum of 40 mm high to prevent the chair from sliding but not tilting.
- **H.3.4** Means of measuring and applying the force as set out in Table 1.
- H.3.5 If required, a panel to spread the load over the back cross members.
- H.3.6 Balancing load as in Table 1.
- H.3.7 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface.

H.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

H.5 Procedure

H.5.1 Apply the force by means of the back loading pad with the centre of the pad positioned at the BLP determined as per Annex B or at a point 100 mm below the top of the back whichever is the lower.

When this test is applied to a chair with a very low back, apply the backward force horizontally to the front edge of the seat.

review

H.5.2 Prevent the chair from moving rearward by placing stops behind the rear feet (See Figure H.1).



Figure H.1 — Back fatigue test

H.5.3 Apply the force for the number of times specified in Table 1 with the balancing load specified applied at the SLP. If conducting the seat fatigue test at the same time, then during each cycle apply the force to the seat (see Figure H.1).

H.6 Test report

The following information shall be reported:

- a) whether the back of the chair was broken or deformed;
- b) relevant data to indicate the chair being tested;
- c) the colour and mould number of the chair being tested;
- d) the intended use as marked on the chair, domestic or commercial;
- e) the level to which the chair was tested;
- f) details of any deviations from this test; including data relevant to the chair design if this test does not cater for it;
- g) the date of test; and
- h) the name, address and qualifications of the test facility.

Annex

(normative)

Leg forward static load test

I.1 Scope

This annex sets out a method of testing the integrity of the legs of a chair.

NOTE 4.2.8 specifies the compliance requirements.

I.2 Principle

A load is applied to the chair whilst the chair is tilted in order to test the integrity of the front legs of the chair.

I.3 Apparatus

I.3.1 A force of either 1250 N or 1800 N

I.3.2 A 300 mm diameter (timber/medium density fibreboard/particle board) disc to spread the load over the seat surface

- **I.3.3** Stops, at a maximum of 40 mm high to prevent the chair from sliding but not tilting
- I.3.4 Means of measuring in millimetres
- 1.3.5 Floor surface of flat smooth, polished stainless steel sheet on a hard substrate surface
- I.3.6 Inclinable test platform

I.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

I.5 Procedure

I.5.1 Restrain the front feet of the chair from movement with stops.

1.5.2 Incline the test bed until the chair reaches equilibrium and is just about to overturn.

1.5.3 Apply the specified load to the, chair at a point 150 mm from the front edge of the seat through the 300 mm disc. Hold this load for 10 s. Repeat a total of 10 times (see Figure I.1).

evilen





Figure I.1 – Leg forward static load test



I.6 Test report

The following information shall be reported:

- a) whether the chair supported the load, that is, whether the front legs of the chair gave way, or were broken or deformed;
- b) whether the chair was damaged;
- c) relevant data to indicate the chair being tested;
- d) the colour and mould number of the chair being tested;
- e) the intended use as marked on the chair, domestic or commercial;
- f) the level to which the chair was tested;
- g) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it;

h) the date of test;

i) he name, address and qualifications of the test facility; and

j) the authority or qualification of the signatory.

Annex J

(normative)

Leg rearward static load test

J.1 Scope

This annex sets out a method for testing the integrity of chairs legs.

NOTE 4.2.9 specifies the compliance requirements.

J.2 Principle

A load is applied to a chair whilst the chair is tilted, in order to test the integrity of its rear legs.

J.3 Apparatus

J.3.1 A force of either 1250 N or 1800 N

J.3.2 A 300 mm diameter (timber/medium density fibreboard/particle board) disc to spread the load over the seat surface

- J.3.3 Stops at a maximum of 40 mm high to prevent the chair from sliding but not tilting
- J.3.4 Means of measuring in millimetres
- J.3.5 Floor surface of flat smooth polished stainless steel sheet on a hard substrate surface
- J.3.6 Inclinable test platform

J.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

J.5 Procedure

J.5.1 Restrain the rear feet of the chair from movement with stops.

J.5.2 Incline the test bed until the chair reaches equilibrium and is just about to overturn.

J.5.3 Apply the specified load to the chair at the seat loading point through the 300 mm disc. Hold this load for 10 s. Repeat a total of 10 times (see Figure J.1).

evien



Figure J.1 – Leg rearward static load test



J.6 Test report

The following information shall be reported:

- a) whether the chair supported the load, that is, whether the rear legs of the chair gave way;
- b) whether the chair was damaged;
- c) relevant data to indicate the chair being tested;
- d) the colour and mould number of the chair being tested;
- e) the intended use as marked on the chair, domestic or commercial;
- f) the level to which the chair was tested;
- g) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it;

h) the date of test;

i) the name, address and qualifications of the test facility; and

j) the authority or qualification of the signatory.

Annex K

(normative)

Leg sideways static load test

K.1 Scope

This annex sets out a method for testing the integrity of the chair legs.

NOTE 4.2.10 specifies the compliance requirements.

K.2 Principle

A load is applied to the chair whilst the chair tilted, in order to test the integrity of the legs.

K.3 Apparatus

K.3.1 Force of either 1250 N or 1800 N

K.3.2 300 mm diameter (timber/medium density fibreboard/particle board) disc to spread the load over the seat surface

K.3.3 Stops at a maximum of 40 mm high to prevent the chair from sliding but not tilting

- K.3.4 Means of measuring in millimetres
- K.3.5 Floor surface of flat smooth polished stainless steel sheet on a hard substrate surface
- K.3.6 Inclinable test platform

K.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

K.5 Procedure

K.5.1 Restrain two side feet of the chair from movement with stops.

K.5.2 Incline the test bed until a point midway between the base of the unrestrained feet is 150 mm above the height of the restrained feet.

K.5.3 Apply the specified load to the chair at the seat loading point through the 300 mm disc. Hold this load for 10 s. Repeat a total of 10 times (see Figure K.1).

evilen



Figure K.1 – Leg sideways static load test



K.6 Test report

The following information shall be reported:

- a) whether the chair supported the load; i.e. whether the two legs supporting the chair gave way;
- b) whether the chair was damaged;
- c) relevant data to indicate the chair being tested;
- d) the colour and mould number of the chair being tested;
- e) the intended use as marked on the chair, domestic or commercial;
- f) the level to which the chair was tested;
- g) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it;
- h) the date of test;

i) the name, address and qualifications of the test facility; and

j) the authority or qualification of the signatory.

evien

Annex L (normative)

Seat impact test

L.1 Scope

This annex sets out a method for testing the integrity of the chair seat when subjected to downward impacts.

NOTE 4.2.11 specifies the compliance requirements.

L.2 Principle

An impacter is dropped freely from a specified height to determine if the chair can withstand the force.

L.3 Apparatus

L.3.1 Foam for facing loading pads, consisting of a 25 mm thick layer of polyether foam with a hardness index whet measured according to ISO 2439, Method A, of 135/660 N and a density of 27 kg/m3 to 30 kg/m3. Alternatively, a layer of this foam may be positioned between the loading pad and the test structure.





a) circular body of approximately 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 have a mass of 17 kg \pm 0.1 kg and the whole apparatus, including mass, springs and striking surface, has a mass of 25 kg \pm 0.1 kg. .

b) springs with a combined spring system that has a nominal spring rate of 0.69 kg/mm ± 0.1 kg/mm and total friction resistance of the moving parts between 0.025 kg and 0.045 kg;

The spring system is compressed to an initial load of 104 kg \pm 0.5 kg (measured statically) and the amount of spring compression movement available from the initial compression point to the point where the springs become fully closed is not less than 60 mm.

- c) striking surface of an approximately flat leather pad containing fine dry sand;
- NOTE No equivalent device can be used.
- L.3.3 Means of measuring in millimetres; and
- L.3.4 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface.

L.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere.

L.5 Procedure

L.5.1 Place the piece of foam on the seat if required.

L.5.2 Allow the seat impacter (see Figure L 1) to fall freely from the appropriate height specified in Table 1 onto the SLP as specified by the chair loading point template (see Annex B and Figure L.2). Repeat this test 10 times.



Figure L.2 – Seat impact test

L.5.3 Repeat the test at a point on the centre-line of the chair 100 mm inwards from the front edge of the chair. Repeat this test 10 times.

L.6 Test report

The following information shall be reported:

- a) whether the seat was broken or deformed;
- b) relevant data to indicate the chair being tested;
- c) the colour and mould number of the chair being tested;
- d) the intended use as marked on the chair domestic or commercial;
- e) the level to which the chair was tested;
- f) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it;

for

11

- g) the date of test;
- h) the name, address and qualifications of the test facility; and
- i) the authority or qualification of the signatory.

CN

Annex M (normative)

Drop test

M.1 Scope

This annex sets out a method to test the structural integrity of a chair when dropped.

NOTE 4.2.12 specifies the compliance requirements.

M.2 Principle

The chair is lifted and dropped from a specified height onto one leg to determine the ability of the chair to resist damage.

M.3 Apparatus

- M.3.1 Means of measuring the angle 10°
- M.3.2 Means of supporting the chair at 10° to horizontal
- M.3.3 Means of measuring the height of the drop in millimetres
- NOTE Using cords is one way of suspending the chair
- M.3.4 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface

M.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

M.5 Procedure

M.5.1 Support the chair so that, at impact on one foot, the line joining that foot to the foot diagonally opposite is inclined at 10° to the horizontal, whilst the line joining the remaining feet is horizontal.

M.5.2 Lift up the chair to the appropriate height specified in Table 1 above the test floor.

M.5.3 Drop the chair 10 times onto a front leg, and 10 times onto a rear leg (see Figure M.1).

evilen





Figure M.1 – Drop test

NOTE This test may be carried out by lifting the chair by three cords that are adjusted in length with the chair standing in the correct orientation on a plane inclined at 10° to the horizontal.

M.6 Test report

The following information shall be reported:

- a) whether the chair was broken or deformed;
- b) relevant data to indicate the chair being tested;
- c) the colour and mould number of the chair being tested;
- d) the intended use as marked on the chair, domestic or commercial;
- e) the level to which the chair was tested;
- f) details of any deviations from this test, including data relevant to the chair design if this test does not cater for it;
- g) the date of test;
- h) the name, address and qualifications of the test facility; and
- i) the authority or qualification of the signatory.

Annex N

(normative)

Rearward overturning

N.1 Scope

This Annex sets out a method for testing the stability of the chair when a horizontal force is applied.

NOTE 4.3.2.1 specifies the compliance requirements.

N.2 Principle

A specified test load is applied to the seat of the chair and an overturning force is applied to the back of the chair to determine the chair's resistance to overturning.

N.3 Apparatus

- N.3.1 Stops, at a maximum of 40 turn high to prevent the chair from sliding but not overturning
- N.3.2 Means of applying a force of 600 N
- N.3.3 Strap to keep weight in position
- N.3.4 Means of measuring and applying a force as specified in Table 1
- N.3.5 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface

N.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

N.5 Procedure

- **N.5.1** Position the chair on a horizontal surface.
- **N.5.2** Apply the force by means of the small seat loading pad on the centreline of the seat loading point.
- **N.5.3** Restrain the rear legs with stops.
- **N.5.4** Apply the force on the back as shown in Figure N.1.



N.6 Test report

The following information shall be reported:

- a) whether the chair overturned;
- b) relevant data to indicate the chair being tested;
- c) the colour and mould number of the chair being tested;
- d) the intended use is marked on the chair, domestic or commercial;
- e) the level to which the chair was tested;
- f) details of any deviation from this test, including data relevant to the chair design if this test does not cater for it;
- g) the date of test;
- h) the name, address and qualifications of the test facility; and
 - the authority or qualification of the signatory.

i)

Annex O (normative)

Frontward overturning

O.1 Scope

This annex sets out a method for testing the stability of the chair when a vertical force is applied.

NOTE 4.3.2.2 specifies the compliance requirements.

O.2 Principle

A specified load is applied at a specified angle to determine the resistance to overturning by the chair.

O.3 Apparatus

- O.3.1 Means of measuring an angle of 45°
- 0.3.2 Stops, a maximum of 40 mm high that prevent the chair from sliding but not overturning
- 0.3.3 Load equivalent to 40 % of the weight of the chair
- 0.3.4 Strap not exceeding 75 min in width, to keep the load in position
- 0.3.5 Floor surface of horizontal flat smooth polished stainless steel sheet on a hard substrate surface

O.4 Test conditions

Immediately before testing, the chair shall stand for at least 24 h in a standardized atmosphere at a temperature of 23 °C \pm 2 °C.

O.5 Procedure

0.5.1 Calculate and record 40 % of the weight of the chair.

0.5.2 Restrain the front legs of the chair with the stops.

0.5.3 Apply a downwards load at 45° (0.785 radian) to the floor by attaching the strap over the front portion of the seat (as shown in Figure 0.1).



Figure 0.1 – Front stability test

Apply the load equal to 40 % of the weight of the chair. 0.5.4

O.6 Test report

The following information shall be reported:

- a) whether the chair overturned;
- relevant data to indicate the chair being tested; b)
- the colour and mould number of the chair being tested; c)
- the intended use as marked on the chair, domestic or commercial; d)
- the level to which the chair was tested; e)
- details of any deviations from this test, including data relevant to the chair design if this test does not f) cater for it;
- the date of test; g)
- the name, address and qualifications of the test facility; and h)

the authority or qualification of the signatory. i)

Bibliography

- KS 1821: 2005, Plastic monobloc chairs Specification [1]
- [2] TZS 1232: 2010, Plastic monobloc chairs - Specification

FLAS 150.2023 FOT PULDIC REVIEW

EAS 150.202 for public review