International Standard

ISO 9221

First edition
2024-11

Furniture — Children's high chairs — Safety requirements and test methods

Ameublement — Chaises hautes pour enfants — Exigences de sécurité et méthodes d'essai

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

Reference number
ISO 9221:2024(en)

© ISO 2024

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

COPYRIGHT PROTECTED DOCUMENT

© ISO 2024

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

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

Published in Switzerland

Contents

Page

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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

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

This first edition cancels and replaces ISO 9221-1:2015 and ISO 9221-2:2015, which have been merged into one single document and technically revised.

The main changes are as follows:

— complete review of the document in a hazard base format;

— addition of chemical and thermal hazards in Clauses 6 and 7, respectively;

— addition of a dynamic strength test in 8.8.5;

— inclusion of specific requirements for high chairs with more than two castors/wheels in 8.11.1;

— improvement of restraint system requirements to require a passive crotch restraint for products with a horizontal component in front of the baby in 8.9.1.1.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

Introduction

This document has been prepared in order to specify requirements and test methods intended to minimize accidents to children resulting from normal use and reasonably foreseeable misuse of children's high chairs.

The test methods are designed to evaluate properties without regard to materials, design/construction or manufacturing processes.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

Furniture — Children's high chairs — Safety requirements and test methods

1 Scope

This document specifies safety requirements for free-standing children's high chairs that elevate children to dining table height, usually for the purposes of feeding or eating. Children's high chairs are for children up to three years of age who are capable of sitting unaided.

This document is applicable to children's high chairs for domestic and non-domestic use. It does not apply to special high chairs for medical purposes.

NOTE If a children's high chair is or can be converted into other functions, additional standards can apply.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 48-4, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 4: Indentation hardness by durometer method (Shore hardness)*

ISO 8124-2:2023, *Safety of toys — Part 2: Flammability*

ISO 8124-3, *Safety of toys — Part 3: Migration of certain elements*

ISO 8124-6, *Safety of toys — Part 6: Certain phthalate esters*

ISO 14362-1, *Textiles — Methods for determination of certain aromatic amines derived from azo colorants — Part 1: Detection of the use of certain azo colorants accessible with and without extracting the fibres*

ISO 14362-3, *Textiles — Methods for determination of certain aromatic amines derived from azo colorants — Part 3: Detection of the use of certain azo colorants, which may release 4-aminoazobenzene*

ISO 17234-1, *Leather — Chemical tests for the determination of certain azo colourants in dyed leathers — Part 1: Determination of certain aromatic amines derived from azo colourants*

ISO 17234-2, *Leather — Chemical tests for the determination of certain azo colorants in dyed leathers — Part 2: Determination of 4-aminoazobenzene*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
active restraint system
system where a carer performs an action to ensure that a child is secured in the restraint system

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

3.2
passive restraint system
system where a carer does not perform an action to ensure that a child is secured in the restraint system

3.3
crotch restraint
device passing between the legs of a child and preventing the child from slipping forwards out of the high chair

3.4
waist restraint
rigid or flexible device(s), which, when fastened, goes from one side of the high chair to the other, passing in front of a child's waist or surrounding a child's waist

3.5
shoulder restraint
device passing over the shoulders and connecting either to a *crotch restraint* (3.3) or to a *waist restraint* (3.4)

3.6
locking device
component that maintains part(s) of a product in the position of use

EXAMPLE Latch, a hook, an over centre lock.

3.7
operating device
part of the *locking mechanism(s)* (3.9) or *parking device(s)* (3.8) designed to be activated by a carer by one or several action(s)

3.8
parking device
device intended to prevent rolling of castors/wheels

3.9
locking mechanism
assembly consisting of one or more *locking device(s)* (3.6) and one or more *operating device(s)* (3.7)

3.10
junction line
intersection of a seat and a backrest

3.11
paint or similar surface-coating
fluid, semi-fluid or other material, with or without colouring matter, which changes to a solid film when a thin layer is applied to a metal, wood, leather, cloth, plastic or another surface

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

4 General

4.1 Test conditions

The high chair shall be tested as delivered. If the high chair is a knock-down type, it shall be assembled according to the instructions supplied with it. If the instructions allow for different adjustments or configurations of components (e.g. inclination of the backrest, height of the seat, position of the tray, position of castors/wheels), the most onerous combination shall be used for each test, unless otherwise specified in the test method.

Knock-down fittings shall be tightened before testing. Further re-tightening shall not take place.

© ISO 2024 – All rights reserved

4.2 Application of forces

The forces in the static load tests shall be applied sufficiently slowly to ensure that negligible dynamic force is applied.

The tests are described in terms of the application of forces; however, masses can be used. The relationship 10 N = 1 kg shall be used for this purpose.

4.3 Tolerances

Unless otherwise stated, the following tolerances apply:

— forces: ±5 % of the nominal force;

— masses: ±0,5 % of the nominal mass;

— dimensions: ±1,0 mm of the nominal dimension;

— angles: ±2° of the nominal angle;

— positioning of loading pads: ±5 mm.

NOTE For the purposes of uncertainty in measurements, test results are not considered to be adversely affected when the above tolerances are met.

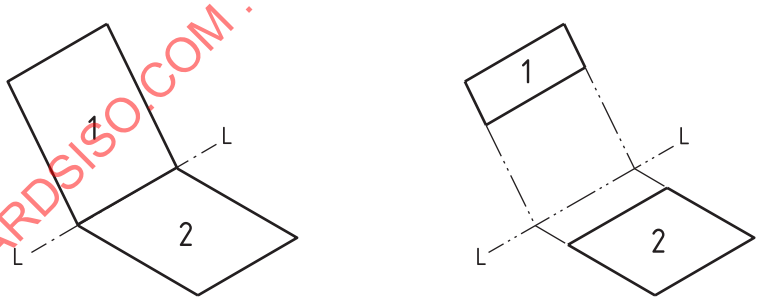
4.4 Test sequence

The tests in Clause 8 shall be carried out on the same high chair and in the order of the clauses of this document.

4.5 Determination of the junction line

The junction line is shown in Figure 1.

Where the backrest and the seat do not meet, the junction line is the projection of the backrest onto the seat (see Figure 1).



Key

1 backrest

2 seat

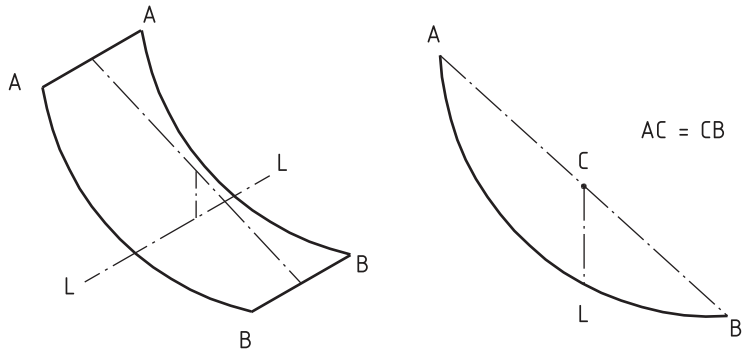
LL junction line

Figure 1 — Junction line

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

When the seat unit is in the form of a hammock, a theoretical junction line, "LL", shall be determined as shown in Figure 2. The junction line may vary when the backrest is adjusted in different positions.



Key

AA top edge of the backrest
BB front edge of the seat
LL junction line
CL vertical projection of C on the hammock
C mid-point between A and B

Figure 2 — Junction line for seat units in the form of a hammock

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

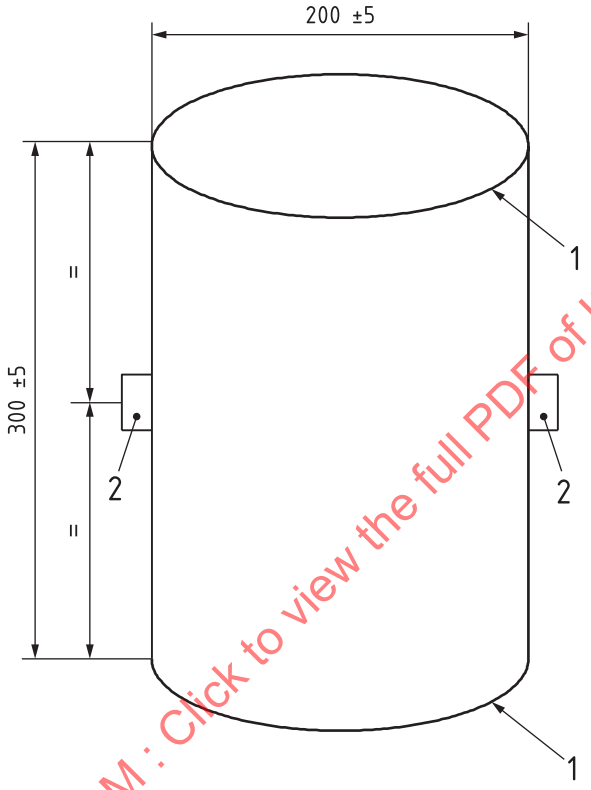
© ISO 2024 – All rights reserved

5 Test equipment

Unless otherwise specified, test forces may be applied by any suitable device as results are dependent only upon correctly applied forces and not upon the apparatus.

5.1 Test mass A: A rigid cylinder 200 mm in diameter and 300 mm in height, having a mass of 15 kg with its centre of gravity 150 mm above its base. The edges shall have a radius of 5 mm. Two anchorage points shall be provided. These shall be positioned 150 mm from the base and at an angle of 180° to each other around the circumference (see Figure 3).

Dimensions in millimetres



Key

1 edge radius: (5 ± 1) mm

2 anchorage points

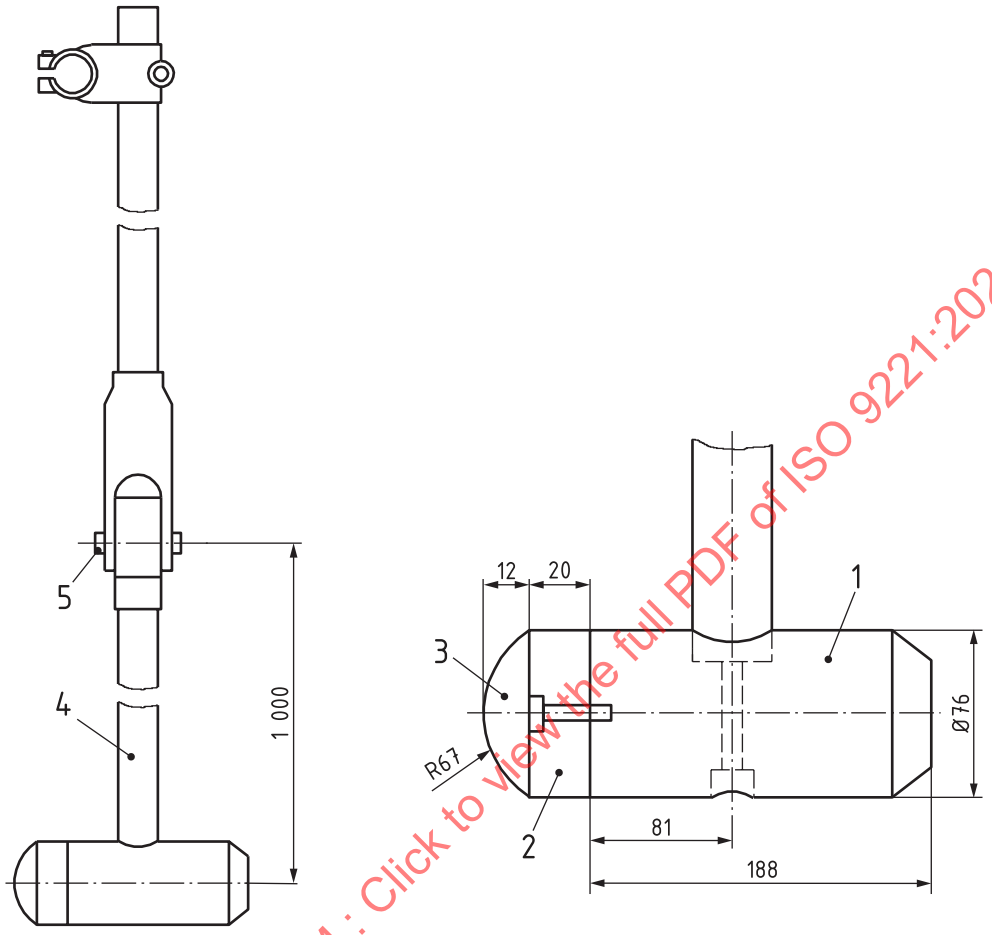
Figure 3 — Test mass A

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

5.2 Impact hammer: A striker in the form of a cylindrical object having a total mass of 6,5 kg supported from a pivot by a steel tube of 38 mm in diameter and with a wall thickness of 2 mm (see Figure 4). The distance between the pivot and the centre of gravity of the striker shall be 1 000 mm. The pendulum arm shall be pivoted by a low friction bearing.

Dimensions in millimetres



Key

1 pendulum head, steel mass 6,4 kg
2 hardwood
3 rubber (50 ± 10) Shore A (see ISO 48-4)
4 pendulum arm, length 950 mm; high tensile steel tube Ø 38 mm × 2 mm; mass (2 ± 0,2) kg
5 pivot point

Mass of assembly (key numbers 1, 2 and 3): (6,5 ± 0,07) kg.

Figure 4 — Impact hammer

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

5.3 Large loading pad: A rigid cylindrical object 100 mm in diameter having a smooth hard surface and edges rounded with radius of 12 mm.

5.4 Small loading pad: A rigid cylindrical object 30 mm in diameter having a smooth hard surface and edges rounded with radius of (0,8 ± 0,3) mm.

5.5 Stops, which prevent the high chair from sliding but not tilting, no higher than 12 mm. Except in cases where the design of the item necessitates the use of higher stops, in which case the lowest stops that will prevent the item from sliding shall be used.

© ISO 2024 – All rights reserved

5.6 Floor surface: A horizontal, flat and rigid plane with a smooth surface.

For the tests according to 8.8.6.4, a 2 mm thick rubber mat, with hardness (75 ± 10) Shore A in accordance with ISO 48-4, shall be used on a concrete floor.

5.7 Beams for stability testing and for measuring the length of the lateral protection.

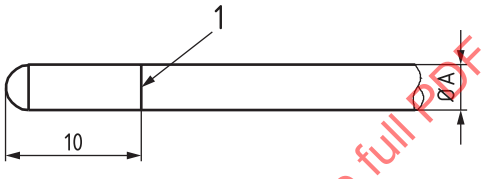
5.7.1 Beam, not less than 900 mm long, with a square section of 25 mm × 25 mm and with a mass of (0,5 ± 0,01) kg.

5.7.2 Beam for measuring the height for lateral protection test, 86 mm wide and with a mass of (0,5 ± 0,01) kg.

5.8 Probes for finger entrapment.

5.8.1 Finger probe, made of plastic or another hard, smooth material, with diameters $7^{0}_{-0,1}$ mm and $12^{+0,1}_{0}$ mm, with a hemispherical end (see Figure 5) and which can be mounted on a force-measuring device.

Dimensions in millimetres



Key

1 line around the probe showing the depth of penetration

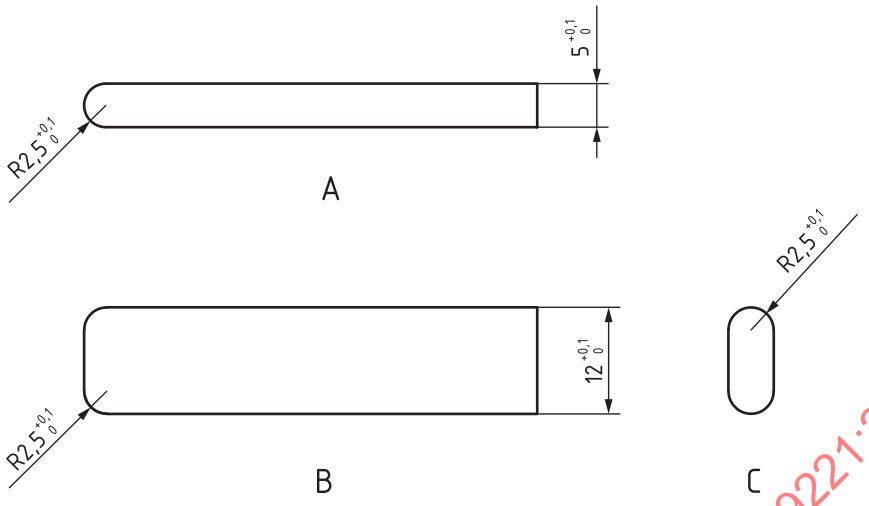
A diameter

Figure 5 — Test probes with hemispherical ends

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

5.8.2 Shape assessment probe, made of rigid and smooth material, with the dimensions shown in Figure 6.



Key

A side view
B top view
C front view

Figure 6 — Shape assessment probe

5.9 Test mass B: A cylinder with a mass of 5 kg and a diameter of 100 mm.

5.10 Small parts cylinder for the assessment of small components, having dimensions in accordance with Figure 7.

Dimension in millimetres

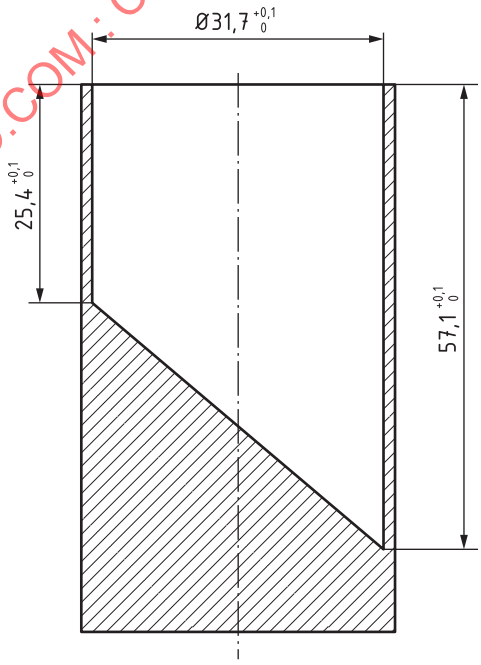


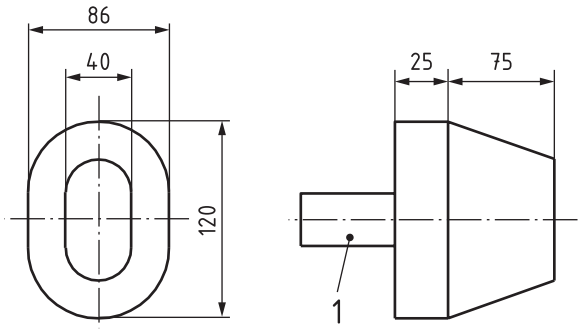
Figure 7 — Small parts cylinder

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

5.11 Small torso probe made from plastic or another hard, smooth material, with dimensions as shown in Figure 8.

Dimensions in millimetres



Key

1 handle

Figure 8 — Small torso probe

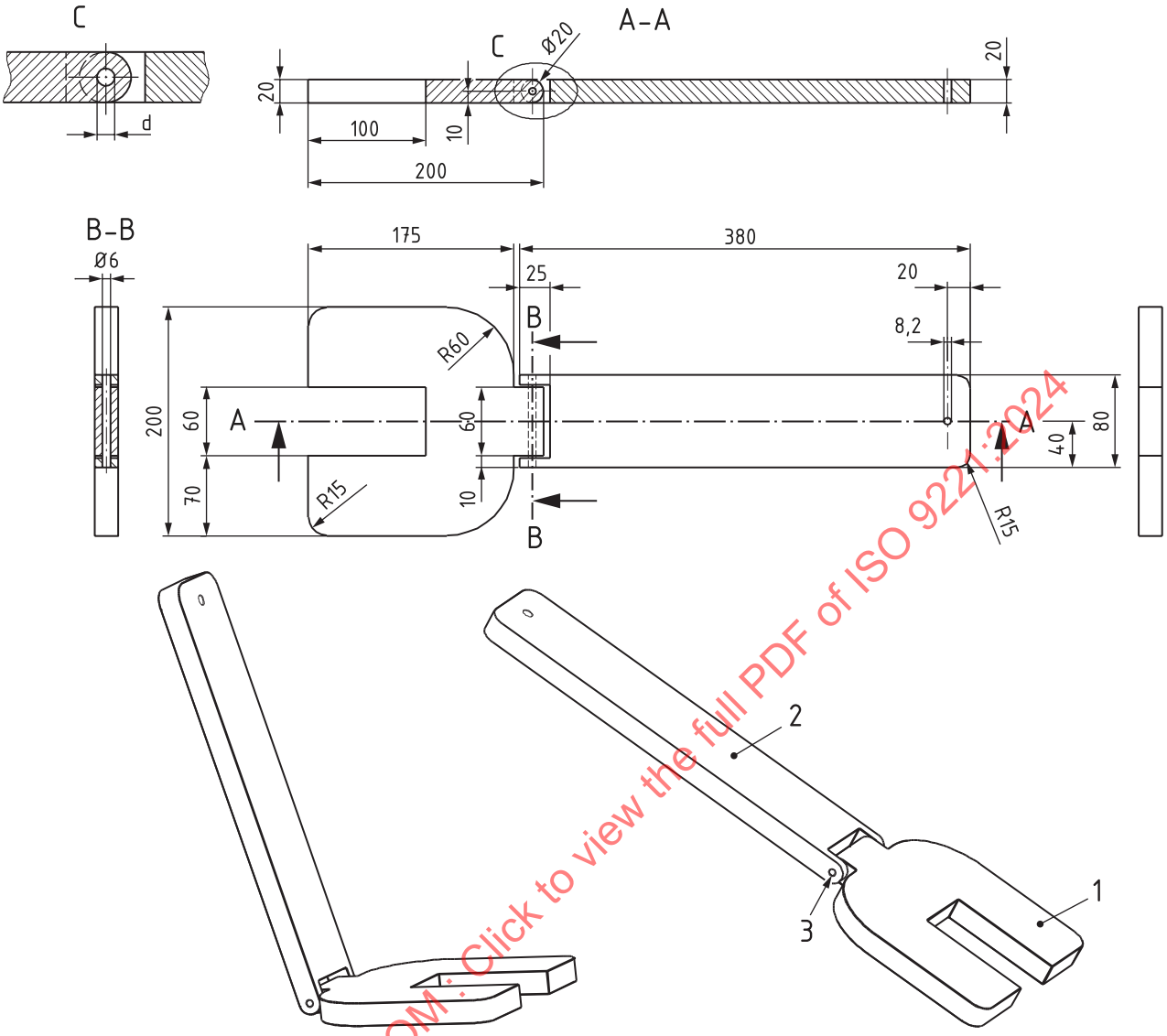
5.12 Test mass C: An object made of steel with a total mass of (9 ± 0,1) kg and with dimensions as specified in Figure 9.

All edges shall be rounded or chamfered.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

Dimensions in millimetres



Key

1 seat part [mass: (4,495 ± 0,05) kg]

2 backrest part [mass: (4,501 ± 0,05) kg]

3 hinge pin made of steel [mass of hinge pin: (17 ± 0,5) g, length: 79,5 mm]

d diameter: 6 mm

Dimension tolerances: ±2 mm.

Figure 9 — Test mass C

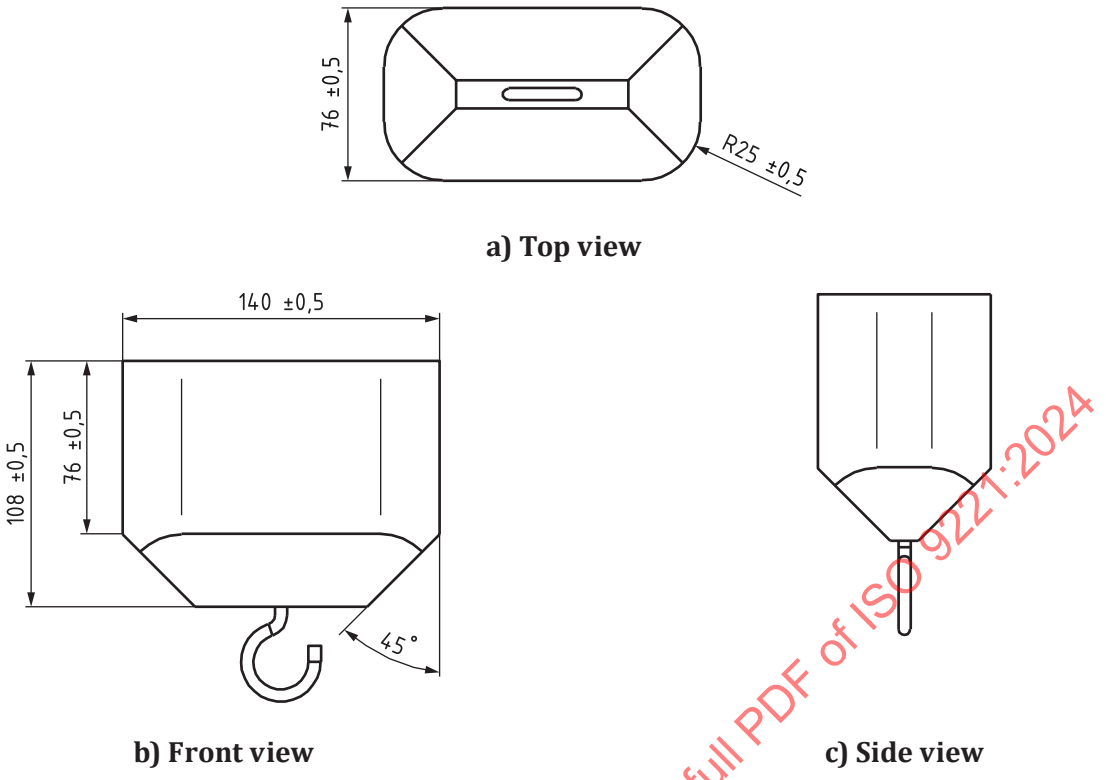
STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

5.13 Leg probe: A cylindrical probe with a diameter of 38 mm and a length of at least 76 mm.

5.14 Wedge block made of plastic or another hard, smooth material, with dimensions according to Figure 10.

© ISO 2024 – All rights reserved

Dimensions in millimetres



a) Top view

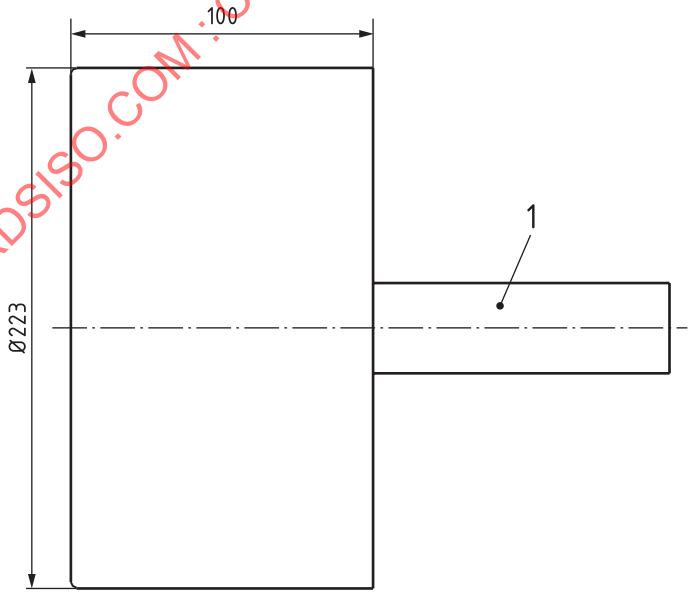
b) Front view

c) Side view

Figure 10 — Wedge block

5.15 Large head probe made of plastic or another hard, smooth material, with dimensions according to Figure 11.

Dimensions in millimetres



Key

1 handle

Figure 11 — Large head probe

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

5.16 Impactor: A cylindrical bag with a diameter of 150 mm filled with steel shot with a diameter of (4 ± 2) mm. The total mass shall be 23 kg.

5.17 Wood block, with dimensions of 150 mm by 150 mm with a thickness of 25 mm and with the edges rounded with a radius of 8 mm.

5.18 Feeler gauge, with a thickness of (0,4 ± 0,02) mm and an insertion end radius of (3 ± 0,5) mm (see Figure 12).

Dimensions in millimetres

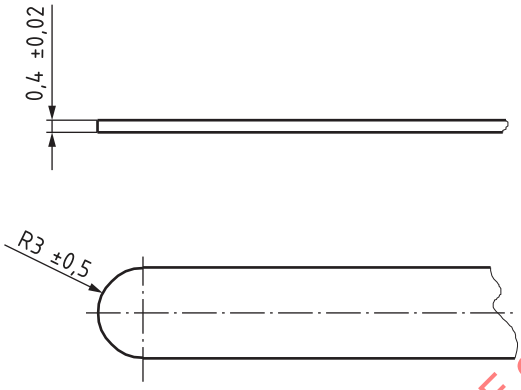


Figure 12 — Feeler gauge

5.19 Test mass D: A mass of 9 kg on a base area of 200 mm × 100 mm.

6 Chemical hazards (see Clause A.2)

6.1 General

In general, the main materials used in children's high chairs are plastics or polymers, coatings, rubber, fabrics, leather, artificial leather, etc.

6.2 Requirements

6.2.1 General

The chemicals presented by material given in Table 1 shall conform to the requirements given in 6.3 to 6.6.

Table 1 — Chemicals by material

Materials	Migration of certain elements (see 6.3)	Phthalates (see 6.4)	Azo colorants (see 6.5)	Flame retardants (see 6.6)
Plastics	X	X		X
Coating	X	X		
Rubber	X	X		
Artificial leather	X	X	X	X
Fabric	X		X	X
Leather	X		X	
Other materials	X			
NOTE Other materials (e.g. paper and paperboard, wood, bamboo) are included, but metal, glass and ceramics are excluded.				

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

6.2.2 Sampling

The sample for testing shall be representative of the material used in mass production. Identical materials may be combined and treated as a single test portion. Test portions may be composed of more than one material or colour only if physical separation, such as dot printing, patterned textiles or mass limitation reasons, precludes the formation of discrete specimens.

NOTE 1 The manufacturing process ensures that it does not increase prohibited risk to the materials.

Where a surface is coated with a multi-layer of paint or similar surface-coating, the test sample shall not include any of the base material.

NOTE 2 If the composite materials (e.g. coated fabric) can be mechanically separated, each homogenous material is tested separately.

For migration of certain elements and phthalates tests, a test portion of less than 10 mg from a single laboratory sample shall not be tested.

If the mass of the test portion from a single sample is greater than 10 mg but less than the normal mass for testing, it is recommended to supplement the test materials with either:

a) identical materials from other locations of the same sample; or

b) sampling from raw materials.

If raw materials are used instead of finished product, this shall be noted in the test report.

6.3 Migration of certain elements

All accessible materials (see Table 1) shall not exceed the amounts of elements given in Table 2, considering the correction factor when tested in accordance with ISO 8124-3.

Table 2 — Maximum acceptable element migration from children's high chairs materials

Element	Sb	As	Ba	Cd	Cr	Pb	Hg	Se
Limit (mg/kg)	60	25	1 000	75	60	90	60	500

6.4 Phthalates

All accessible plasticized materials (see Table 1) shall not contain phthalates exceeding the limits given in Table 3.

The test procedure given in ISO 8124-6 shall be used.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

Table 3 — Maximum acceptable phthalates in children's high chairs

Material	Substance	CAS Registry Number®[a]	Limit
Plastic or polymer, coating, artificial leather and rubber	Bis (2-ethylhexyl) phthalate (DEHP)	117-81-7	Concentrations equal to or less than 0,1 % by mass
	Dibutyl phthalate (DBP)	84-74-2	
	Benzyl butyl phthalate (BBP)	85-68-7	
Plastic or polymer, coating, artificial leather and rubber that can be placed in the mouth by children	Di-n-octyl phthalate (DNOP)	117-84-0	Concentrations equal to or less than 0,1 % by mass
	Di-'isononyl' phthalate (DINP)	28553-12-0	
		68515-48-0	
	Di-'isodecyl' phthalate (DIDP)	26761-40-0	
		68515-49-1	

[a] CAS Registry Number® is a trademark of the American Chemical Society (ACS). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

6.5 Azo colorants

All accessible coloured fabrics, leather and artificial leather shall not contain aromatic amines as given in Table 4, which can be released by reductive cleavage of one or more azo groups.

Table 4 — Limits of aromatic amines in children's high chairs

Material	Substance	CAS RN®	Limit mg/kg
Fabrics, leather (including artificial)	4-aminobiphenyl	92-67-1	30
	benzidine	92-87-5	30
	4-chloro-o-toluidine	95-69-2	30
	2-naphthylamine	91-59-8	30
	o-aminoazotoluene	97-56-3	30
	5-nitro-o-toluidine	99-55-8	30
	4-chloroaniline	106-47-8	30
	4-methoxy-m-phenylenediamine	615-05-4	30
	4,4′-diaminodiphenylmethane	101-77-9	30
	3,3′-dichlorobenzidine	91-94-1	30
	3,3′-dimethoxybenzidine	119-90-4	30
	3,3′-dimethylbenzidine	119-93-7	30
	4,4′-methylenedi-o-toluidine	838-88-0	30
	p-cresidine	120-71-8	30
	4,4′-methylene-bis-(2-chloro-aniline)	101-14-4	30
	4,4′-oxydianiline	101-80-4	30
	4,4′-thiodianiline	139-65-1	30
	o-toluidine	95-53-4	30
	4-methyl-m-phenylenediamine	95-80-7	30
	2,4,5-trimethylaniline	137-17-7	30
	2-methoxyaniline	90-04-0	30
	4-aminoazobenzene	60-09-3	30
	2,4-xylidine	95-68-1	30
	2,6-xylidine	87-62-7	30

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

The test procedure given in ISO 14362-1 and ISO 14362-3 for fabric, and ISO 17234-1 and ISO 17234-2 for leather, shall be used.

A test portion below 0,2 g in a single laboratory sample shall be exempted from test. All colours shall be tested. Up to three colours may be combined as one specimen.

Under the conditions of ISO 14362-1 and ISO 17234-1, those Azo colorants that are able to form 4-aminoazobenzene also generate two other amines, namely aniline (CAS RN® 6253-3) and 1,4-phenylenediamine (CAS RN® 106-50-3). Due to detection limits, it can be that only aniline is detected. If aniline of above 5 mg/kg is detected, then the presence of these colorants shall be tested in accordance with ISO 14362-3 for fabric or ISO 17234-2 for leather, which can release 4-aminoazobenzene.

NOTE "White" does not always mean uncoloured.

6.6 Flame retardants

Accessible plastics, artificial leather and fabrics in children's high chairs that are not treated with flame retardants shall be exempted from the flame-retardant requirement. Only a declaration of conformity statement is required. The example template given in A.2.3 can be used.

Accessible plastics, artificial leather and fabrics in children's high chairs that are treated with flame retardants shall not contain the flame retardants listed in Table 5 according to the limits given in Table 5.

Table 5 — Flame retardants concerned in children's high chairs

CAS RN®	Substance	Limit
25637-99-4	Hexabromocyclododecane (HBCDD)	< 100 mg/kg
5436-43-1	Tetrabromodiphenyl ether (tetra-BDE)	< 10 mg/kg
32534-81-9	Pentabromodiphenyl ether (penta-BDE)	< 10 mg/kg
36483-60-0	Hexabromodiphenyl ether (hexa-BDE)	< 10 mg/kg
189084-68-2	Heptabromodiphenyl ether (hepta-BDE)	< 10 mg/kg
32536-52-0	Octabromodiphenyl ether (octa-BDE)	< 0,1 %
1163-19-5	Decabromodiphenyl ether (deca-BDE)	< 0,1 %
59536-65-1	Polibrominated biphenyl (PBB)	Not to be used[a]
126-72-7	Tri-(2,3_dibromopropyl)-phosphate (TRIS)	Not to be used[a]
545-55-1	Tris-(aziridinyl)-phosphinoxide (TEPA)	Not to be used[a]
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	< 5 mg/kg
13674-87-8	Tris-Dichlorpropylphosphat (TDCPP)	< 5 mg/kg
13674-84-5	Tris-Chlorpropylphosphat (TCPP)	< 5 mg/kg

NOTE Relevant regulations include the European Union REACH (registration, evaluation, authorisation and restriction of chemicals), RoHS (restriction of hazardous substances), POPs (persistent organic pollutants), TSD (Toy Safety Directive), etc.

[a] "Not to be used" means undetectable when testing is performed.

7 Thermal hazards (see Clause A.3)

Separate samples may be used for these tests.

This requirement is only applicable to textiles, coated textiles and plastic coverings. It does not apply to hook and loop fasteners, cords and alike.

Materials shall not produce a surface flash effect when applying a flame in accordance with ISO 8124-2:2023, 5.5.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

8 Mechanical hazards (see Clause A.4)

8.1 Hazards caused by foldable products

8.1.1 Requirements

8.1.1.1 General

There shall be at least one locking mechanism which prevents a high chair from folding while in use and also when a child is being placed into and removed from the high chair.

8.1.1.2 Incomplete deployment

In order to prevent hazards due to incomplete deployment, the high chair shall fulfil one of the following:

a) the mass of the child in the high chair shall act to prevent the folding; or

b) at least one locking device shall engage automatically, when the product is ready for use.

8.1.1.3 Unintentional folding of the high chair

Unintentional folding of the high chair shall be prevented. This requirement is fulfilled if one of the following conditions is met before and after testing in accordance with 8.1.2.1:

a) at least one operating device requires a minimum force of 50 N to activate, with and without test mass A (5.1) on the seat; or

b) folding is only possible if at least one locking mechanism requires the use of a tool; or

c) folding is only possible when two independent operating devices are operated simultaneously; or

d) there are two or more automatically engaging locking devices that both cannot be released by one single action; or

e) folding of the high chair requires two consecutive actions, the first of which shall be maintained while the second is carried out.

8.1.1.4 Locking mechanism strength

When tested in accordance with 8.1.2.2, the high chair shall not fold and the locking mechanism shall remain engaged.

8.1.2 Test methods

8.1.2.1 Durability of the locking mechanism

Operate all locking mechanisms 300 times.

8.1.2.2 Strength of the locking mechanism

Place the high chair on the floor with the test mass A (5.1) at the centre of the seat.

Apply a force of 200 N at the point and in the direction considered most likely for the high chair to fold.

If the high chair tends to tilt, secure it in a manner which prevents tilting but not folding.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

8.2 Hazards caused by height adjustment

8.2.1 General

This requirement does not apply to high chairs in which the seat height cannot be adjusted, either due to the construction of the high chair or when a child is inside the high chair.

There shall be locking mechanism(s) to prevent the seat unit of a high chair from moving from a higher to a lower position.

8.2.2 Incomplete seat height adjustment

In order to prevent hazards due to incomplete seat height adjustment, at least one locking device shall engage automatically when the seat is adjusted in height.

8.2.3 Unintentional release of the seat height adjustment mechanism

In order to prevent unintentional release of the seat height adjustment mechanism, one of the following requirements shall be fulfilled before and after testing in accordance with 8.1.2.1:

a) at least one operating device requires a minimum force of 50 N to activate, with and without test mass A (5.1) on the seat; or

b) height adjustment requires the use of a tool; or

c) release is only possible when two independent operating devices are operated simultaneously; or

d) there are two or more automatically engaging locking devices that both cannot be released by one single action; or

e) height adjustment requires two consecutive actions, the first of which shall be maintained while the second is carried out.

8.3 Entrapment hazards (see A.4.1)

8.3.1 Entrapment of fingers

8.3.1.1 Requirement

With the exception of the back of the backrest, parts of the high chair from the floor up to and including the under-surface of the seat and buckles and adjusters of the restraint system, there shall not be any completely bounded openings in rigid materials that let the 7 mm probe go through unless the depth of penetration is less than 10 mm or unless the shape assessment probe (5.8.2) enters when tested in accordance with 8.3.1.2.

8.3.1.2 Test method

Check whether the 7 mm probe (5.8.1) with an applied force of up to 30 N enters 10 mm or more into any completely bounded opening in rigid materials in any possible direction. If the 7 mm probe enters 10 mm or more, then the shape assessment probe (5.8.2) shall also enter 10 mm or more with an applied force of up to 5 N.

8.3.2 Entrapment of head

8.3.2.1 Requirements

With the exception of the entrance to the seat unit, the two openings for a child's legs and openings in the frame above the level of the top surface of the lateral protection, there shall not be any holes, gaps or openings above the seat surface which allow the small torso probe (5.11) to pass through when tested according to 8.3.2.2.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

8.3.2.2 Test method

Check whether the small torso probe (5.11) with an applied force of up to 30 N enters into any accessible opening located above the seat.

The probe shall be inserted from inside the seat unit in a straight direction along the longitudinal axis of the probe.

8.4 Hazards caused by moving parts (see A.4.2)

8.4.1 Requirements on compression points

This requirement does not apply to the back of the backrest, the parts from the floor up to and including the under-surface of the seat, and the buckles of the restraint system.

After the high chair has been set up for normal use in accordance with the manufacturer's instructions, there shall not be any accessible hazardous compression points which can close to less than 12 mm (unless they are always less than 5 mm), as the result of:

a) movements of the high chair; or

b) movements of the child using the high chair; or

c) the application of an external force (either by another child or, unintentionally, by the carer or by a powered mechanism).

Hazardous compression points between the tray and the structure shall be assessed by applying a vertical downward force of 50 N in the most onerous point on the tray.

8.4.2 Requirements for shearing points

This requirement does not apply to the back of the backrest, the parts from the floor up to and including the under-surface of the seat, and the buckles of the restraint system.

After the high chair has been set up for normal use in accordance with the manufacturer's instructions, there shall not be any accessible hazardous shearing points which can close to less than 12 mm, as the result of:

a) movements of the high chair; or

b) movements of the child using the high chair; or

c) the application of an external force (either by another child or, unintentionally, by the carer or by a powered mechanism).

8.5 Entanglement hazards (see A.4.3)

8.5.1 Requirements

These requirements do not apply to the restraint system.

Cords, ribbons and similar parts shall have a maximum free length of 220 mm when tested in accordance with 8.5.2.

Where cords, ribbons and similar parts are attached to the high chair together or within 80 mm of each other, all single cords shall have a maximum free length of 220 mm and the combined length from one loose end to the end of another loose end shall be a maximum of 360 mm (see Figure 13).

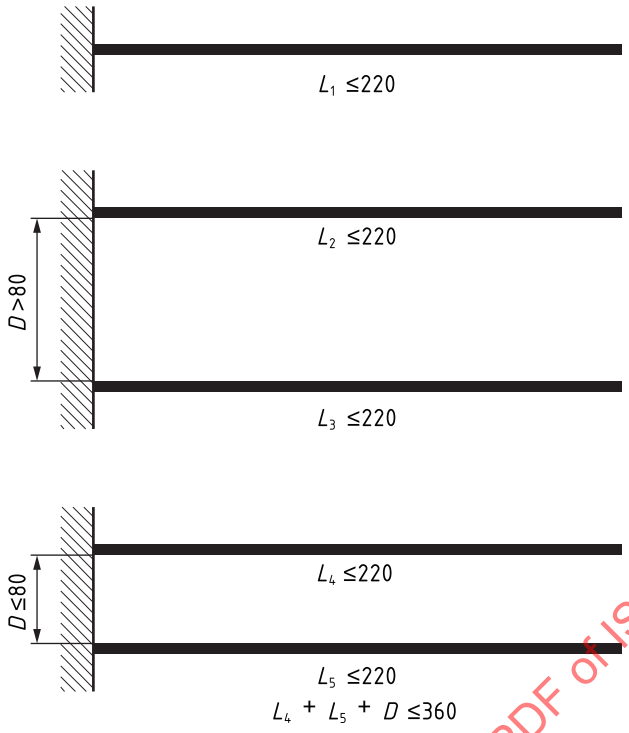
Loops shall have a maximum peripheral dimension of 360 mm, when tested in accordance with 8.5.2.

Monofilament threads shall not be used.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

Dimensions in millimetres



Key

L_x length of the single cord

D distance between the attachments

Figure 13 — Examples of measuring cords, ribbons or similar parts

8.5.2 Test method

The length of a cord, ribbon or similar part shall be measured from the fixing point on the high chair to the free end of the cord, ribbon or similar part under a 25 N tensile force.

The peripheral dimension of a loop shall be measured from the fixing point on the high chair of one end to the fixing point of the other end under a 25 N tensile force.

8.6 Choking and ingestion hazards (see A.4.4)

8.6.1 Requirements

Any component that is considered capable of being gripped by a child in accordance with 8.6.2.1 shall be tested in accordance with 8.6.2.2 and 8.6.2.3. Any component or part of a component that is removed shall not fit entirely within the small parts cylinder (5.10).

With the exception of the back of the backrest, parts from the floor up to and including the under-surface of the seat, and buckles and adjusters of the restraint system, parts of a high chair containing filling material shall have at least one covering. When tested in accordance with 8.6.2.4, it shall not be possible to insert the front part of the 12 mm diameter probe (5.8.2) by more than 6 mm into any generated opening in the covering materials or their joints that gives access to the filling material.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

8.6.2 Test methods

8.6.2.1 Assessment of a child's ability to grip components

A component is considered able to be gripped if a child can grip the component between their thumb and forefinger or between their teeth.

Where it is difficult to assess whether a child can grip a component, establish whether it is possible to insert the feeler gauge (5.18) between the component and the underlying layer or body of the high chair at an angle between 0° and 10° from the surface of the underlying layer or high chair, using a force of (10 ± 1) N. If the gauge can be inserted more than 2 mm, the component is considered able to be gripped by a child.

8.6.2.2 Torque test

Apply a torque gradually to the component within a period of 5 s in the clockwise direction until either:

a) a rotation of 180° from the original position has been attained; or

b) a torque of 0,34 Nm is reached.

The maximum rotation or required torque shall be applied for 10 s.

The component shall then be allowed to return to a relaxed condition and the procedure repeated in the anticlockwise direction.

Where projections, components or assemblies are rigidly mounted on an accessible rod or shaft designed to rotate together with the projections, components or assemblies, the rod or shaft shall be clamped to prevent rotation during the test.

If a component, which is attached by a screw or similar fixing device, becomes loose during the application of the required torque, the torque shall continue to be applied until the required torque is met or the component disassembles, or it becomes apparent that the component will not disassemble.

Clamps and test equipment shall not cause damage the attachment mechanism or body of the component.

Check whether any component or part of a component that is removed during the test fits wholly in any orientation without compressing or manipulating it, within the small parts cylinder (5.10).

8.6.2.3 Tensile test

Attach a suitable clamp to the component, taking care not to damage the attachment mechanism or the body of the component.

Apply a tensile force of up to 90 N to the component. The force shall be applied gradually within a period of 5 s and maintained for 10 s.

Check whether any component or part of a component that is removed during the test fits wholly within the small parts cylinder (5.10) in any orientation without compressing or manipulating it.

8.6.2.4 Accessibility of filling materials

Use clamps with jaws, to which discs with a diameter of 19 mm are affixed (see Figure 14).

Attach the clamps to the covering where the disc jaws can be fully applied not less than 30 mm apart and equidistant to the junction of parts (e.g. seam, welding, glued).

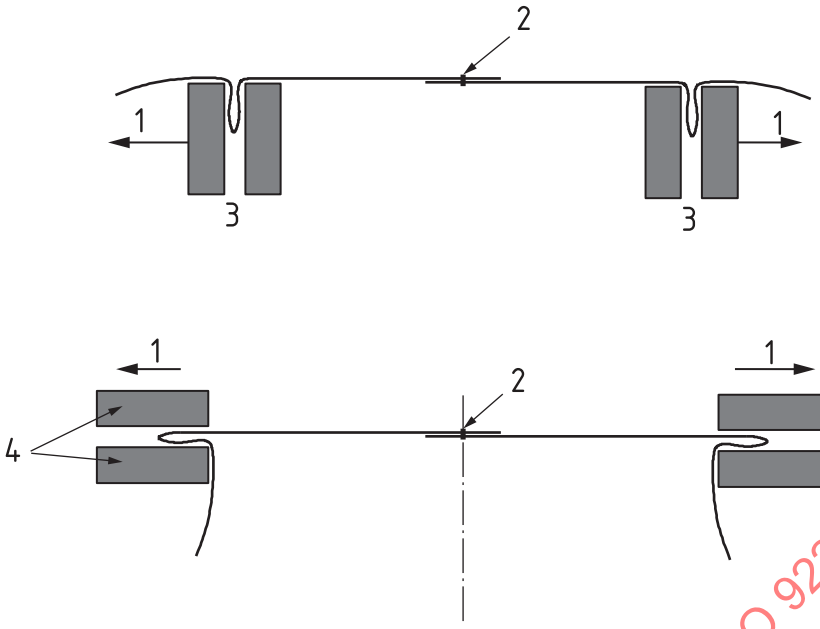
Gradually apply a force of (70 ± 2) N between the two clamps over a period of approximately 5 s. Maintain the force for 10 s, and then release the force.

Apply the test once for each different joint of covering materials.

Check whether it is possible to insert the 12 mm probe (5.8.1) by more than 6 mm using a maximum force of 10 N.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved



Key

1 separating force
2 seam
3 free space between discs
4 discs holding the material

Figure 14 — Examples of clamping

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

8.7 Hazards caused by edges, corners and protruding parts (see A.4.6)

All accessible edges, corners and protruding parts on the high chair shall be rounded or chamfered and free from burrs.

8.8 Strength and durability hazards, and structural integrity (see A.4.7)

8.8.1 Requirements

Connecting screws for direct fastening (e.g. self-tapping screws) shall not be used for the assembly of any component that is designed to be removed or loosened when dismantling the high chair for the purpose of transportation or storage.

After completing all the tests in accordance with 8.8.2, 8.8.3, 8.8.4, 8.8.5, 8.8.6.1, 8.8.6.2 and 8.8.6.3, the requirements in 8.1, 8.3 and 8.7 shall be fulfilled, and the safety and functions of the high chair shall be unimpaired.

8.8.2 Impact test

The high chair shall be placed on the floor surface (5.6) in the normal position of use with the legs against stops (5.5) in the opposite direction of the force. For high chairs that can be adjusted in height, adjust the height at the highest position.

Adjust the impact hammer (5.2) to fall from a height (H) of 116 mm. The hammer shall strike the structure at the impact point, when the arm of the impact hammer is vertical (see Figure 15).

The impact hammer shall strike from the outside to:

— the centre of the uppermost point of the back, see Figure 15 b);

© ISO 2024 – All rights reserved

— the centre of the tray if available;

— the centre of the horizontal member, see Figure 15 c);

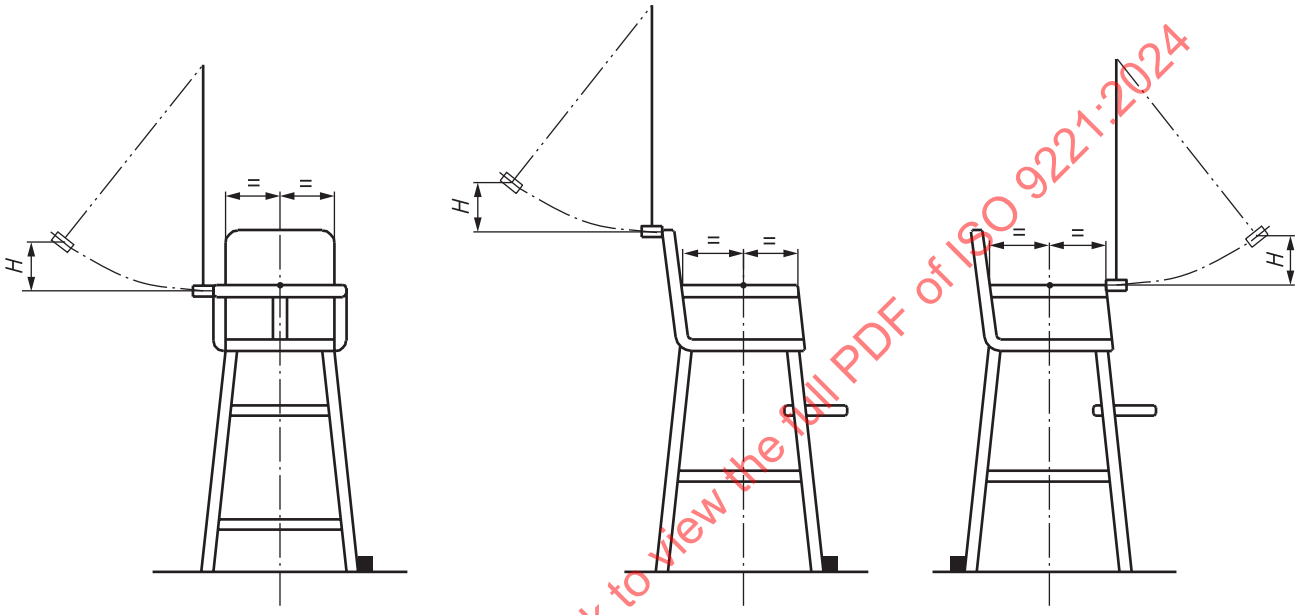
— both lateral protections, see Figure 15 a).

If the high chair can be fitted with a detachable tray, the tests shall be done with and without the tray.

If the high chair overturns during the test, it shall be prevented from touching the ground.

Repeat the test on the backrest from the inside of the high chair in the same manner as above.

The tests shall be carried out for a total of five times at each point.



a) b) c)

Key

H falling height

Figure 15 — Impact test

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

8.8.3 Seat vertical static load test

Place 40 kg distributed over an area of 150 mm × 150 mm on the centre of the seat. Maintain the load for 1 min. Lift the high chair clear of the floor by the lateral protection at the point of balance. Maintain the high chair off the floor for 1 min. Remove the load.

8.8.4 Footrest vertical static load test

Place 20 kg distributed over an area of 75 mm × 150 mm on the centre of the footrest with the longer side parallel to the front line of the footrest. Maintain the load for 1 min. Remove the load.

8.8.5 Dynamic strength test

The high chair shall be placed on the floor surface (5.6) in the normal position of use. Prevent movement of the high chair on the floor surface without impairing the test.

Place the wood block (5.17) in the centre of the seat.

© ISO 2024 – All rights reserved

Position the impactor (5.16) above the wood block and let it drop freely from a height of 75 mm.

Repeat for a total of 500 cycles at a frequency of (15 ± 1) cycles per minute.

For high chairs that can be adjusted in height, the number of drops shall be equally divided in the highest and the lowest positions.

Damages caused by the wooden block (e.g. splinters, damages in the fabric cover) shall be disregarded.

8.8.6 Tray tests

8.8.6.1 Requirements

When tested according to 8.8.6.2, the tray shall not break or become detached and its function shall not be impaired.

A tray not part of the protective function, which can be removed for the purpose of cleaning, is not considered a failure if detached in the test, as long as it does not break.

When tested according to 8.8.6.3, the high chair shall not overturn.

When tested according to 8.8.6.4, the tray shall fulfil the requirements of 8.3.1, 8.4, 8.6 and 8.7 and its function shall not be impaired.

8.8.6.2 Tray strength test

With the tray fitted to the high chair, fix the seat so that it cannot move in the direction of the force being applied. Apply 10 times a horizontal force of 200 N to the tray at each of the following positions in turn:

a) forwards at the centre of the front edge at its uppermost surface;

b) rearwards at the centre of the rear edge at its uppermost surface;

c) sideways outwards at the centre of one side at its uppermost surface;

d) sideways outwards at the centre of the opposite side at its uppermost surface.

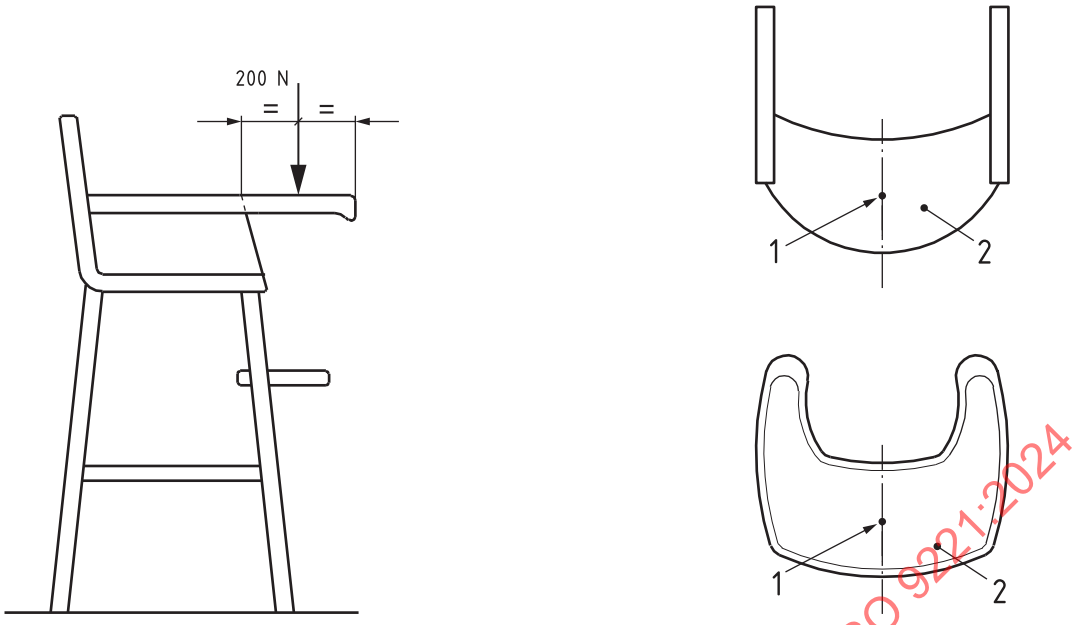
Each test force shall be maintained for 30 s.

8.8.6.3 Tray stability

With the high chair unloaded, apply a downwards vertical force of 200 N at the mid-point of centre line of the tray (see Figure 16). For high chairs that can be adjusted in height, adjust the height at the highest position. Maintain the load for 1 min.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved



a) Side view **b) Top view tray**

Key

1 application point

2 tray

Figure 16 — Tray stability

8.8.6.4 Tray drop test

This test is only applicable to removable trays.

Remove the tray from the high chair and drop it once through a height of 1 000 mm onto the floor surface (5.6), on each of the following positions:

— on one long edge;

— on one short edge;

— on the bottom;

— adjacent to the fastening points;

— one other point likely to be damaged by the test.

8.9 Hazards from falls out of the high chair (see A.4.8)

8.9.1 Restraint system

8.9.1.1 Requirements on restraint systems

8.9.1.1.1 General requirements

The high chair shall have either an active restraint system conforming to 8.9.1.1.2 or a passive restraint system conforming to 8.9.1.1.3.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

If the backrest can be reclined to less than 60° to the horizontal measured in accordance with 8.9.1.2.1, the product shall have an active restraint system (see 8.9.1.1.2).

Straps of the restraint system, if any, shall have a minimum width of 19 mm.

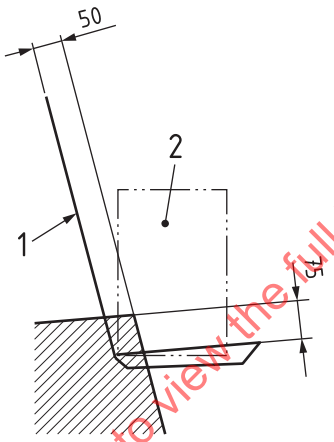
All parts of the restraint system shall function as intended before and after testing in accordance with 8.9.1.2.3.

The maximum slippage of the straps through any type of adjuster shall be 20 mm, when tested in accordance with 8.9.1.2.4.

After testing in accordance with 8.9.1.2.4, adjusters and buckles shall function as intended.

When a high chair is fitted with attachment points for an additional harness as described in the instructions for use, these shall function as intended after testing in accordance with 8.9.1.2.2. The attachment points shall be independently fixed and shall at all times remain within 50 mm in front of and not more than 75 mm above the junction line, i.e. in the shaded area shown in Figure 17.

Dimensions in millimetres



Key

1 high chair

2 test mass A (5.1)

Figure 17 — Location of the attachment points for additional harness

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

8.9.1.1.2 Requirements for high chairs with an active restraint system

The active restraint system shall be supplied with the high chair.

The high chair shall be fitted with lateral protection conforming to 8.9.2.2.

The restraint system shall be adjustable to the size of the child and shall comprise of at least one of the following:

a) a waist restraint and a crotch restraint, where the crotch restraint shall be such that the waist restraint can be used only in conjunction with it;

b) an integral restraint system comprising of either:

   1) a crotch restraint, a waist restraint and shoulder restraints, where the crotch restraint shall be such that the waist restraint can be used only in conjunction with it; or

   2) a restraint that passes over the child's shoulders and between the child's legs.

Products with a horizontal element in front of the child (e.g. a bar or a tray) shall also have a passive crotch restraint, unless the opening between the horizontal element and the seat allows the passage of the large

© ISO 2024 – All rights reserved

head probe (5.15) when tested in accordance with 8.9.1.2.8. This additional passive crotch restraint shall not allow the leg probe (5.13) to pass from one leg opening to the other when tested in accordance with 8.9.1.2.5.2.

8.9.1.1.3 Requirements for high chairs with a passive restraint system

High chairs, which are not supplied with an active restraint system, shall have a passive restraint system conforming to the following requirements:

a) the high chair shall be fitted with lateral protection conforming to 8.9.2.3;

b) the high chair shall have a crotch restraint and a horizontal element, which create openings for a child's legs;

c) the leg openings shall not allow passage of the wedge block (5.14) when tested in accordance with 8.9.1.2.5.1;

d) the passive crotch restraint shall not allow the leg probe (5.13) to pass from one leg opening to the other when tested in accordance with 8.9.1.2.5.2;

e) the horizontal distance between the front surface of the backrest and the crotch restraint shall be less than 216 mm when measured in accordance with 8.9.1.2.6;

f) the horizontal distance between the front surface of the backrest and the horizontal member shall be less than 250 mm when measured in accordance with 8.9.1.2.7.

8.9.1.2 Test methods for the restraint system

8.9.1.2.1 Determination of backrest angle

Place the test mass C (5.12) with:

— its seat part on the seat of the high chair;

— its backrest part against the backrest of the high chair;

— the hinge aligned with the junction line (see 4.5);

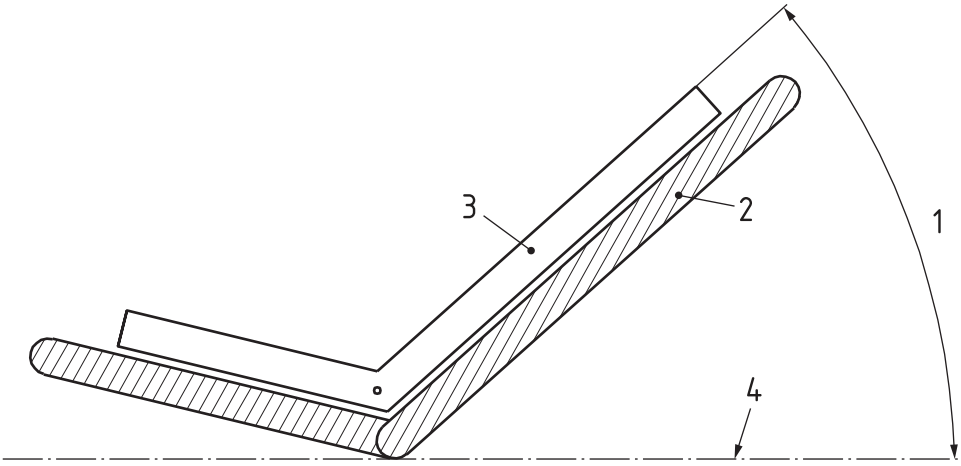
— its longitudinal axis aligned with the longitudinal axis of the seat as shown in Figure 18.

If applicable, adjust the backrest to the most reclined position.

Measure the angle between the backrest part and the horizontal.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved



Key

1 angle between backrest and the horizontal
2 backrest
3 test mass C (5.12)
4 horizontal

Figure 18 — Determination of backrest angle

8.9.1.2.2 Strength of restraint attachment points

With the seat of the high chair fixed, gradually apply, to each attachment point in turn, a force of 150 N once within 5 s and maintain it for 1 min in the direction of normal use to each of the restraint attachment points.

8.9.1.2.3 Strength of components of the restraint system

Gradually apply, to each component of the restraint system in turn, a force of 150 N once within 5 s and maintain it for 1 min in the direction most likely to cause failure.

8.9.1.2.4 Slippage of straps of the restraint system

Remove approximately 125 mm of the restraint system on both sides of the adjustment system from the product. If the intended function of the restraint system is depending on it being attached to the high chair, then the test shall be carried out without removing it from the high chair.

Fix one of the ends of the removed restraint system to a clamping device in such a way that the strap and the adjustment system hang freely. The distance between the clamping device and the force application point shall be approximately 200 mm. The adjustment system shall be approximately in the middle between the clamping device and the point at which the force is applied.

Apply a force of 10 N to the other end so that the strap is under tension in the same way it is intended when the restraint system is in use. The force shall be applied gradually within 5 s and shall be maintained for (10 ± 1) s. Remove the force.

Draw a line across the width of strap flush with the adjustment system. Other means of establishing the measurement are also accepted.

Gradually apply a force of 150 N within 5 s to the strap and maintain it for (60 ± 2) s. Remove the force.

Draw a line across the width of the strap in the same manner as mentioned above (on the same side of the adjustment system).

Remove the strap from the adjustment system.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

Measure the distance between the centre of the two lines drawn flush with the adjustment system.

8.9.1.2.5 Leg openings test

8.9.1.2.5.1 Wedge block test

The high chair shall be placed on the floor surface (5.6) in the normal position of use. Restrain the high chair so that it cannot slide on the floor surface or tip over.

Position the wedge block (5.14) on the seat with the tapered end towards the leg opening, keeping its main axis perpendicular to the opening.

Gradually pull the wedge block by its hook from the outside of the high chair with a force of 30 N in a straight direction along the wedge block main axis.

8.9.1.2.5.2 Gaps between leg openings

Insert the leg probe (5.13) into one leg opening with its main axis perpendicular to the opening.

Move the probe along the leg opening perimeter, keeping it with its main axis perpendicular to the leg opening, to simulate the movement of the leg of a child seated in the high chair.

Check if the leg probe can pass with a force of 5 N from this leg opening to the other.

8.9.1.2.6 Measuring the distance between the backrest and the crotch restraint

Adjust the backrest to the most upright position and the crotch restraint to the position furthest from the backrest.

Measure the horizontal distance between the front surface of the uncompressed backrest and the uncompressed crotch restraint 50 mm above the lowest point of the uncompressed seat surface along the centreline of the seat.

8.9.1.2.7 Measuring the distance between the backrest and the horizontal member

Position the test mass B (5.9) on the centre line of the seat and with an edge in contact with the junction line. Position an additional mass of (2,5 ± 0,1) kg on the test mass B.

The dimension, *d*, is the distance between the loaded backrest and the loaded horizontal element as shown in Figure 19. It shall be measured along the centre line when using the small loading pad (5.4).

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

a) Top view **b) Side view**

Key

1 seat centreline
2 backrest
3 horizontal member
4 horizontal line
d distance between the backrest and the horizontal element

Figure 19 — Measuring the distance between the backrest and the horizontal member

8.9.1.2.8 Large head probe test

Check if the large head probe (5.15) passes through the opening between the horizontal element and the seat when pushed along the axis of the handle with a force not exceeding 5 N.

8.9.2 Lateral protection

8.9.2.1 General

The high chair shall be fitted with lateral protection.

8.9.2.2 Lateral protection length and height for high chairs fitted with an active restraint system

The lateral protection shall have a height of at least 140 mm, when measured in accordance with 8.9.2.4.1 for at least the length specified below. Openings in the lateral protection and between the lateral protection and the backrest are allowed, provided that they conform to all the relevant requirements of this document.

The lateral protection shall extend to at least 150 mm from the backrest, when measured in accordance with 8.9.2.4.2.

8.9.2.3 Lateral protection length and height for high chairs with a passive restraint system

The lateral protections shall extend up to the horizontal component in front of the torso of the child. Openings in the lateral protection and between the lateral protection and the backrest are allowed, provided that they conform to the relevant requirements of this document.

The lateral protection shall have a height of at least 140 mm along the whole length when measured in accordance with 8.9.2.4.1.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

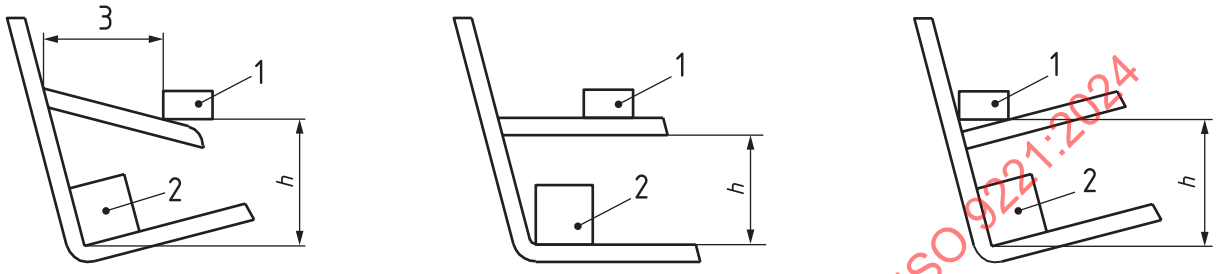
8.9.2.4 Test method for measuring lateral protections

8.9.2.4.1 Measuring lateral protection height

Position the test mass B (see 5.9) on the centreline of the seat with an edge in contact with the junction line.

Position the test beam (5.7.2) across the lateral protection with the 86 mm side in a horizontal position (see Figure 20).

Measure the minimum height of the lateral protection as the vertical distance between the under-surface of the beam and the under-surface of the test mass B (see Figure 20).



a) Not flat lateral protection **b) Horizontal lateral protection** **c) Inclined lateral protection**

Key

1 test beam (5.7.2)
2 test mass B (5.9)
3 length of the lateral protection measured according to 8.9.2.4.2
h lateral protection height

Figure 20 — Lateral protection height and length measurements

In cases where measuring the effective height, *h*, is difficult due to the lack of accessibility to the junction line (or other parts of the high chair required to take the measurement), normal trigonometric means shall be used to determine the height, *h*.

8.9.2.4.2 Measuring lateral protection length for high chairs with an active restraint system

This test method is only applicable to high chairs fitted with an active restraint system.

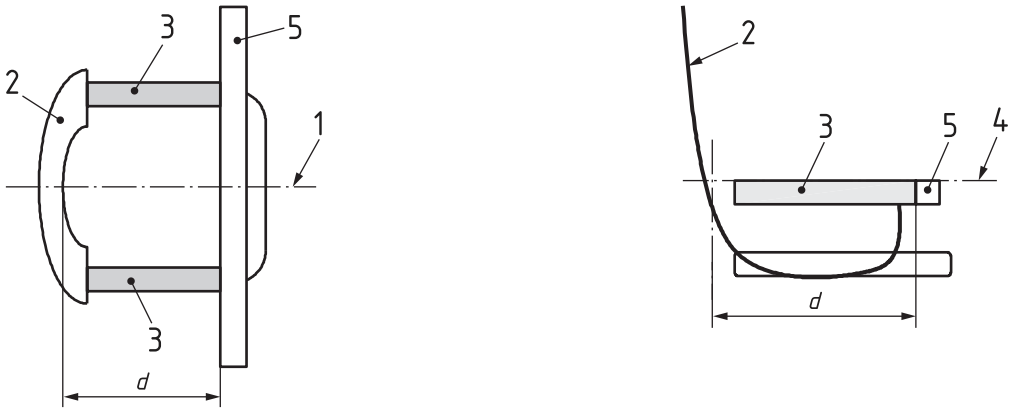
Position the test beam (5.7.1) horizontally with one edge in contact with the front of the lateral protection.

Measure the maximum horizontal distance from the centre of the uncompressed backrest to the beam, parallel to the centreline of the seat (see Figure 21).

In cases where the lateral protections do not have a constant height, the test beam shall be placed at the point in which the height (measured according to 8.9.2.4.1) is at least 140 mm (see Figure 22). Record the distance, *d*, as the length of the lateral protection.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved



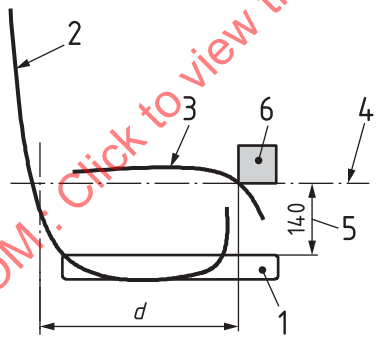
a) Top view **b) Side view**

Key

1 seat centre line
2 backrest
3 lateral protection
4 horizontal line
5 test beam (5.7.1)
d length of lateral protection

Figure 21 — Measuring the length of the lateral protection

Dimensions in millimetres



Key

1 seat
2 backrest
3 lateral protection
4 horizontal line
5 140 mm (8.9.2.4.1)
6 test beam (5.7.1)
d length of lateral protection

Figure 22 — Measuring the length of lateral protection in the case of non-horizontal lateral protection

8.9.3 Backrest

8.9.3.1 Requirements

The high chair shall be fitted with a backrest with a minimum length of 250 mm measured in the upright position in accordance with 8.9.3.2.1 and wide enough to support the back of a child.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

If the angle of the backrest is less than 60° from the horizontal, measured in accordance with 8.9.1.2.1, the minimum length shall be 400 mm, measured in accordance with 8.9.3.2.1.

When tested in accordance with 8.9.3.2.2, the mechanism allowing the backrest to be adjusted, if any, shall not slip from one position to another.

8.9.3.2 Backrest tests

8.9.3.2.1 Determination of backrest length

Place the test mass C (5.12) with:

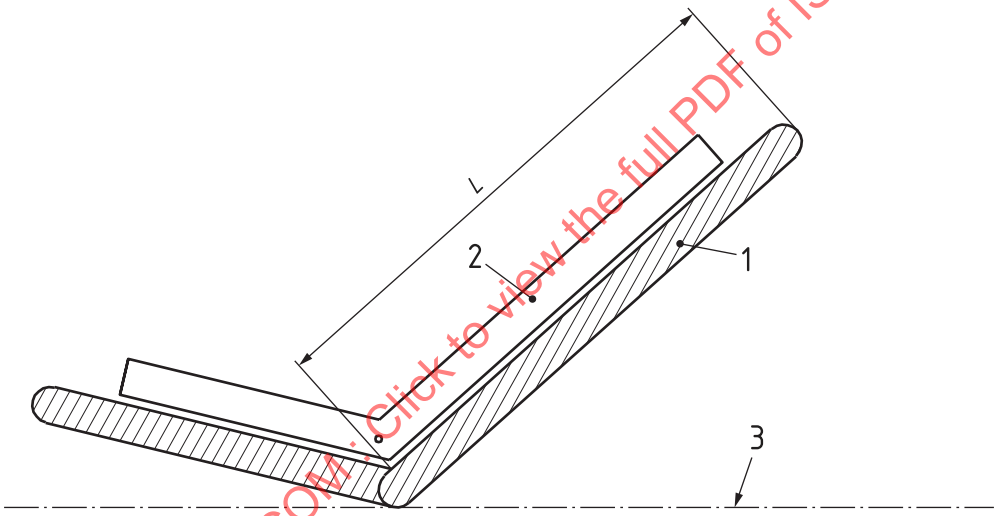
— its seat part on the seat of the high chair;

— its backrest part against the backrest of the high chair;

— the hinge aligned with the junction line (see 4.5);

— its longitudinal axis aligned with the longitudinal axis of the seat as shown in Figure 23.

Measure the backrest length, *L*, in the centreline as shown in Figure 23.



Key

1 backrest
2 test mass C (5.12)
3 horizontal
L backrest length

Figure 23 — Measuring the backrest length

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

8.9.3.2.2 Strength test for reclinable backrest mechanisms

Adjust the backrest to the middle of its adjustment range or, for backrests with only two possible positions, adjust the backrest in the most upright position. With the base of the high chair secured to the floor surface (5.6), apply through the large loading pad (5.3) a rearwards force of 100 N perpendicular to the centre of the backrest at a point 50 mm below its top edge. Maintain the force for 1 h.

8.10 Suffocation hazards (see A.4.5)

These requirements do not apply to shrink packaging that is destroyed when the packaging is opened by the user.

© ISO 2024 – All rights reserved

Plastic sheeting used for packaging with an area greater than 100 mm × 100 mm shall conform to one of the following requirements:

a) have an average sheet thickness of 0,038 mm or more; or

b) be perforated with defined holes so that a minimum of 1 % of the area has been removed over any area of 30 mm × 30 mm.

Plastic bags used for packaging with an opening perimeter greater than 360 mm shall not have a drawstring or cord as a means of closing.

8.11 Castors/wheels (see A.4.9)

8.11.1 General requirements

High chairs can be fitted with two castors/wheels.

High chairs may be fitted with more than two castors/wheels provided that the following three requirements are fulfilled:

a) the mass of the high chair in the lightest condition of use allowed by the manufacturer's instructions shall be ≥ 7 kg when tested in accordance with 8.11.2.1;

b) the force to lift the front legs of the high chair in the lightest condition of use allowed by the manufacturer's instructions shall be ≥ 65 N when measured in accordance with 8.11.2.2;

c) at least two castors/wheels shall be lockable through a parking device, which shall fulfil the requirements in 8.11.3.

8.11.2 Test methods

8.11.2.1 Measurement of mass of the high chair

Remove castors/wheels in excess of the first two, so that only two castors/wheels remain on the high chair. A tray not part of the protective function, shall be removed. Measure the mass.

If castors/wheels cannot be removed without damaging the product, the mass shall be calculated by subtracting the mass of the additional castors/wheels (as provided by the manufacturer) from the total mass of the product including wheels.

8.11.2.2 Measurement of force to lift the front legs of the high chair

Adjust the backrest to the most upright position.

Load the seat of the high chair with test mass D (5.19) with the 200 mm rear edge parallel, and as close as possible, to the junction line.

Castors/wheels shall be unlocked and in the most onerous position. The tray shall be removed if possible.

Stops (5.5) shall be positioned against the rear castors/wheels.

A horizontal force shall be applied 230 mm above the lowest point of the seat surface (see Figure 24) until the front legs start to lift.

Record the force.

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved

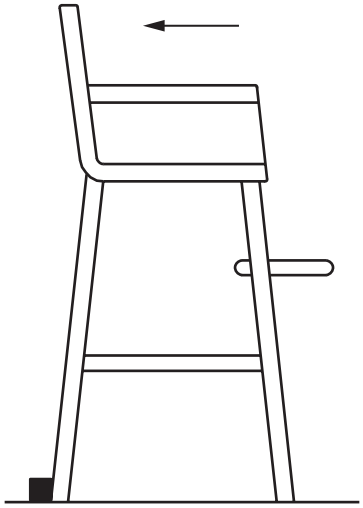


Figure 24 — Test method for measuring the force to lift front legs

8.11.3 Requirements for parking device

When tested in accordance with 8.11.4.1 and 8.11.4.2, the parking device shall not break, and it shall still function as intended.

When tested in accordance with 8.11.4.3, the parking device shall prevent the castors/wheels from rolling, and they shall not unlock.

8.11.4 Test methods for lockable castors/wheels

8.11.4.1 Durability test of the parking device

Engage and disengage the parking device(s) 300 times.

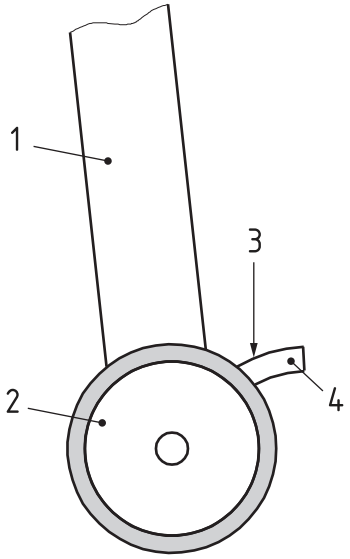
8.11.4.2 Strength test of the parking device

This test is only applicable to foot-activated parking device(s).

Apply a force of 200 N once in the direction of engaging the parking device, directly on the geometric centre of the operating device (see Figure 25).

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved



Key

1 high chair leg
2 castor/wheel
3 force of 200 N applied at the geometric centre
4 operating device

Figure 25 — Example of application of the strength test

8.11.4.3 Test methods for efficiency of parking device

Place the high chair on a horizontal surface covered with aluminium oxide abrasive paper, 80 grit (P80).

Castors/wheels shall be in the position they would normally assume when the high chair travels in the direction it is facing.

Engage all parking device(s).

Load the seat of the high chair with the test mass A (5.1).

Slowly pull the high chair horizontally through its longitudinal axis for 500 mm in a forward direction. Apply the force in the lowest part of the high chair avoiding the lifting during test.

Repeat the test in the rearward direction.

8.12 Stability (see A.4.10)

8.12.1 Requirements

The requirements are applicable to high chairs with and without removable parts fitted.

When tested in accordance with 8.12.2.3, 8.12.2.4, 8.12.2.5 and 8.12.2.6, the high chair shall not overturn, i.e. it shall not lose its balance and fall down.

8.12.2 Stability tests

8.12.2.1 General

For the stability tests in 8.12.2.3 and 8.12.2.4, the test beam (5.7.1) shall be attached to the high chair in a manner so that the mass of the test beam is balanced, i.e. the test beam and its fixings shall have no influence

STANDARDSISO.COM : Click to view the full PDF of ISO 9221:2024

© ISO 2024 – All rights reserved