
Safety of toys —

Part 9:

**Safety aspects related to mechanical
and physical properties —
Comparison of ISO 8124-1, EN 71-1
and ASTM F963**

Sécurité des jouets —

*Partie 9: Aspects de sécurité relatifs aux propriétés mécaniques et
physiques — Comparaison entre l'ISO 8124-1, l'EN 71-1 et l'ASTM F963*

STANDARDSISO.COM : Click to view the full PDF of ISO/TR 8124-9:2020



STANDARDSISO.COM : Click to view the full PDF of ISO/TR 8124-9:2020



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

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
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	vii
Introduction	viii
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Comparison of scopes	1
5 Comparison of terms and definitions	5
5.1 General	5
5.2 Analysis of the main differences between the terms and definitions	8
5.2.1 Aquatic toy	8
5.2.2 Asphyxiation and choking	9
5.2.3 Ball	9
5.2.4 Close-to-the-ear toy	9
5.2.5 Cord	10
5.2.6 Elastic	10
5.2.7 Hand-held toy	11
5.2.8 Hazard	11
5.2.9 Large and bulky toy	11
5.2.10 Marble	12
5.2.11 Paper	12
5.2.12 Pompom	13
5.2.13 Projectile	13
5.2.14 Projectile toy with stored energy	14
5.2.15 Protective cap, protective cover or protective tip	14
5.2.16 Pull or push toy	15
5.2.17 Rattle	15
5.2.18 Toy scooter	16
5.2.19 Squeeze toy	16
6 Comparison of requirements	17
6.1 General	17
6.2 Normal use	17
6.3 Reasonably foreseeable abuse	18
6.4 Material	22
6.4.1 Fillings	23
6.4.2 Expanding materials	23
6.4.3 Glass and porcelain	24
6.5 Small parts	25
6.5.1 General	25
6.5.2 Small parts exemptions	25
6.5.3 Test methods	26
6.6 Shape, size and strength of certain toys	27
6.6.1 General	27
6.6.2 Squeeze toys, rattles and certain other toys	28
6.6.3 Small balls	29
6.6.4 Pompoms	30
6.6.5 Toy pacifiers	30
6.6.6 Balloons	30
6.6.7 Marbles	30
6.6.8 Hemispheric-shaped toys	31
6.6.9 Suction cups	32
6.6.10 Test templates	32
6.7 Edges	33

6.7.1	General	33
6.7.2	Age range for application of the functional sharp edge exemption	34
6.7.3	Toys assembled by adults	34
6.7.4	Test method	34
6.8	Points	35
6.8.1	General	35
6.8.2	Age range for application of the functional sharp point exemption	36
6.8.3	Electrical conductors	36
6.8.4	Examples of accessible, potentially hazardous sharp points	36
6.8.5	Test method	36
6.9	Projections	36
6.9.1	General	36
6.9.2	Ends of rigid handlebars	37
6.9.3	Age grade	37
6.9.4	Bath toy projections	37
6.9.5	Protective components	37
6.10	Metal wires and rods	37
6.10.1	General	37
6.10.2	Scope of the metal wires and rods flexure test	38
6.10.3	Metal wire flexure test methods	38
6.11	Plastic film or plastic bags in packaging and in toys	39
6.11.1	General	39
6.11.2	Scope of plastic film or plastic bags in packaging and in toys	39
6.11.3	Minimum sheet thickness	39
6.11.4	Thickness of plastic balloons	40
6.11.5	Detached plastic sheeting	40
6.11.6	Perforated plastic film	40
6.11.7	Determination of plastic sheet area	40
6.12	Cords	40
6.12.1	General	40
6.12.2	Length of cords, loops, nooses and tangled loops	42
6.12.3	Diameter of certain cords intended for children under 36 months	46
6.12.4	Self-retracting cords	46
6.12.5	Toys attached to or intended to be strung across, or otherwise attached to a cradle, cot, perambulator or carriage	47
6.12.6	Cords on pull toys	48
6.12.7	Cords on toy bags	48
6.12.8	Cords, strings and lines for flying toys	49
6.12.9	Electrical cables	49
6.12.10	Cord warning	50
6.12.11	Test methods and equipment	50
6.12.12	Toy disguise costumes	52
6.13	Folding mechanisms	52
6.13.1	General	52
6.13.2	Hinge line clearance	53
6.13.3	Toy pushchairs, perambulators and similar toys	54
6.13.4	Requirement for folding devices having a scissor-like action	56
6.14	Holes, clearances and accessibility of mechanisms	56
6.14.1	General	56
6.14.2	Holes, clearances and accessibility of mechanisms	56
6.14.3	Accessible clearances for moveable segments	56
6.14.4	Chains or belts in ride-on toys	57
6.14.5	Other driving mechanisms	57
6.14.6	Winding keys	57
6.14.7	Toy bicycles and tricycles provided with a handle that can be used for pushing the child	57
6.15	Springs	58
6.16	Stability and overload requirements	58

6.16.1	Stability requirements for ride-on toys and seats	58
6.16.2	Overload requirements for ride-on toys and seats	62
6.16.3	Stability of stationary floor toys	64
6.17	Enclosures	65
6.17.1	General	65
6.17.2	Impermeable material	65
6.17.3	Ventilation	66
6.17.4	Closures	66
6.17.5	Toy chests safety labelling	66
6.18	Simulated protective equipment, such as helmets, hats and goggles	67
6.19	Projectile toys	67
6.19.1	General	67
6.19.2	General requirements of projectiles	69
6.19.3	Projectile range	69
6.19.4	Impact surface	69
6.19.5	Discharge mechanism	71
6.19.6	Kinetic energy and warning	74
6.19.7	Toy catapults and projectiles propelled by an elastic band and projectile toys without stored energy where the discharge mechanism can store energy, only when held in place by the user	75
6.19.8	Dart	75
6.19.9	Mouth-actuated projectile toys	76
6.19.10	Test method	76
6.20	Rotors and propellers	76
6.20.1	General	76
6.20.2	Scope and exemption	77
6.20.3	Leading part(s) on rigid parts of flying toys	77
6.20.4	Examples of designs to minimize the risk potential of rotating blades	77
6.20.5	Rotor or propeller warning	78
6.20.6	Rotors and propellers on remote controlled flying toys	79
6.21	Aquatic toys	79
6.22	Braking	80
6.22.1	General	80
6.22.2	Braking device — exemptions	81
6.22.3	Braking device – requirements	81
6.22.4	Free wheeling facility	81
6.22.5	Brake performance test	81
6.23	Toy bicycles	82
6.23.1	General	82
6.23.2	Braking system	82
6.23.3	Warning	83
6.24	Speed limitation of electrically driven ride-on toys	83
6.24.1	General	83
6.24.2	Seat requirements	83
6.24.3	Determination of maximum design speed of electrically driven ride-on toys	83
6.25	Toys containing a heat source	85
6.25.1	General	85
6.25.2	Exemption for toys containing a heat source	85
6.25.3	Scope of toys containing a heat source	85
6.25.4	Temperature rise for heat sources	85
6.25.5	Test environment for toys containing a heat source	86
6.26	Liquid-filled toys	86
6.27	Mouth-actuated toys	86
6.28	Toy roller skates, toy inline skates and toy skateboards	87
6.29	Percussion caps	87
6.30	Acoustic requirements	88
6.30.1	General	88
6.30.2	Scope for the acoustic	88

6.30.3	Category of acoustic toys.....	89
6.30.4	Rattles.....	89
6.30.5	Comparison of the acoustic requirements	89
6.30.6	Test method.....	89
6.31	Toy scooters.....	91
6.31.1	General.....	91
6.31.2	Comparison of toy scooter requirements.....	92
6.32	Magnets and magnetic components.....	92
6.33	Yo-yo balls	95
6.34	Straps intended to be worn fully or partially around the neck.....	96
6.35	Sledges and toboggans with cords for pulling.....	96
6.36	Jaw entrapment in handles and steering wheels	97
6.37	Toy gun markings (refer to ISO 8124-1:2018, Annex D).....	97
6.38	Toys attached to food (refer to ISO 8124-1:2018, B.2.8).....	97
6.39	Toys comprising monofilament fibres which may present long hair hazards (refer to ISO 8124-1:2018).....	97
6.40	Packaging and packaging components (spherical, egg-shaped or ellipsoidal, and hemispheric-shaped containers).....	98
Annex A (informative) Index of requirements in EN 71-1.....		99
Annex B (informative) Index of requirements in ASTM F963		112
Annex C (informative) Significant editorial and technical changes to the previous version of this document.....		122
Bibliography.....		124

STANDARDSISO.COM : Click to view the full PDF of ISO/TR 8124-9:2020

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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 181, *Safety of toys*.

This second edition cancels and replaces the first edition (ISO/TR 8124-9:2018), which has been technically revised. The main changes to the previous edition are detailed in [Annex C](#).

A list of all parts in the ISO 8124 series can be found on the ISO website.

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.

Introduction

The purpose of this document is to compare and contrast the identified versions of ASTM F963:2017, EN 71-1:2014+A1:2018 and ISO 8124-1:2018. This document focuses on the contents of these three referenced standards as they relate to mechanical and physical properties including scope, definitions, general requirements, warnings and test methods.

For ease of use and readability, ISO 8124-1:2018, Clause 4 is listed in [Clause 6](#) of this document. For example, ISO 8124-1:2018, 4.3 relates to [6.4](#) of this document.

This document is an overview and, therefore, does not cover the entirety of all the differences between ISO 8124-1, ASTM F963 and EN 71-1. In addition, this document is not to be relied on to fully understand conformity with any of the referenced standards or the requirements within them. In the case of any discrepancies in the comparisons presented, please refer to the relevant clauses of the referenced standards.

The index of requirements in EN 71-1 is given in [Annex A](#).

The index of requirements in ASTM F963 is given in [Annex B](#).

STANDARDSISO.COM : Click to view the full PDF of ISO/TR 8124-9:2020

Safety of toys —

Part 9:

Safety aspects related to mechanical and physical properties — Comparison of ISO 8124-1, EN 71-1 and ASTM F963

1 Scope

This document consists of a comparison of the mechanical and physical requirements covered by the following toy safety standards:

- a) ISO: ISO 8124-1:2018;
- b) Europe (CEN): EN 71-1:2014+A1:2018;
- c) USA: ASTM F963:2017.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Comparison of scopes

The scope of applicable toy products covered by the referenced standards is generally similar, as shown in [Table 1](#).

Table 1 — Scope

ISO 8124-1	EN 71-1	ASTM F963
The requirements in this document apply to all toys, i.e. any product or material designed or clearly intended for use in play by children under 14 years of age	<p>This European Standard applies to toys for children, toys being any product or material designed or intended, whether or not exclusively, for use in play by children of less than 14 years</p> <p><i>NOTE “The words “whether or not exclusively” have been added to the definition to indicate that the product does not have to be exclusively intended for playing purposes in order for it to be considered as a toy, but it can have other functions as well. For example, a key-ring with a teddy bear attached to it is considered as a toy, or a sleeping bag in the shape of a soft filled toy”</i></p>	This specification covers requirements and contains test methods for toys intended for use by children under 14 years of age

Table 2 illustrates the differences in the product types which are exempted from the scope of each standard.

Table 2 — Exemptions

ISO 8124-1	EN 71-1	ASTM F963
Bicycles, except for those considered to be toys, i.e. those having a maximum saddle height of 435 mm	Bicycles with a maximum saddle height of more than 435 mm, measured as the vertical distance from the ground to the top of the seat surface, with the seat in a horizontal position and with the seat pillar set to the minimum insertion mark (see Note 1)	Bicycles
Slingshots	<p>Toy slings and toy catapults, supplied without projectiles. (see Note 2)</p> <p>Toy slings and toy catapults supplied with projectiles are covered by this standard</p>	Sling shots
Darts with metal points	Products and games using sharp-pointed missiles, such as sets of darts with metallic points (see Note 1)	Sharp-pointed darts
Home and public playground equipment	Playground equipment intended for public use (see Note 2)	Playground equipment
Compressed air- and gas-operated guns and pistols	Guns and pistols using compressed gas, with the exception of water guns and water pistols (see Note 1)	Non-powder guns
<p>NOTE 1 For the purpose of EN 71-1, these product types are not considered as toys. There are guidance documents issued by CEN to assist in the classification of toys.</p> <p>NOTE 2 EN 71-1 does not apply to these toys.</p>		

Table 2 (continued)

ISO 8124-1	EN 71-1	ASTM F963
Kites (except for the electric resistance of their strings, which is included)	—	Kites (except for electric resistance of kite strings and handheld lines over 6 ft (1,8 m) long, attached to flying devices intended for use as playthings)
Model kits, hobby and craft items, in which the finished item is not primarily of play value	—	Hobby and craft items in which the finished item is not primarily of play value Model kits in which the finished item is not primarily of play value
Sporting goods and equipment, camping goods, athletic equipment, musical instruments and furniture; however, toys which are their counterparts are included	—	Sporting goods, camping goods, athletic equipment, musical instruments, juvenile products, and furniture However, toys that are their counterparts are covered
Models of aircraft, rockets, boats and land vehicles powered by combustion engines; however, toys which are their counterparts are included	Toy vehicles equipped with combustion engines (see Note 2)	Powered models of aircraft, rockets, boats, and land vehicles; however, toys that are their counterparts are covered
Collectible products not intended for children under 14 years of age	Products for collectors, provided that the product or its packaging bears a visible and legible indication that it is intended for collectors of 14 years of age and above Examples of this category are: — detailed and faithful scale models — kits for the assembly of detailed — scale models — folk dolls and decorative dolls and other similar articles — historical replicas of toys	—
Holiday decorations that are primarily intended for ornamental purposes	Decorative objects for festivities and celebrations (see Note 1)	—
Aquatic equipment intended to be used in deep water, swimming-learning devices and flotation aids for children such as swim-seats and swim-aids	Aquatic equipment intended to be used in deep water, and swimming learning devices for children, such as swim seats and swimming aids (see Note 1)	—
NOTE 1 For the purpose of EN 71-1, these product types are not considered as toys. There are guidance documents issued by CEN to assist in the classification of toys.		
NOTE 2 EN 71-1 does not apply to these toys.		

Table 2 (continued)

ISO 8124-1	EN 71-1	ASTM F963
Toys installed in public places (e.g. arcades and shopping centres)	Automatic playing machines, whether coin operated or not, intended for public use (see Note 2)	—
Puzzles having more than 500 pieces or without a picture, for specialists	Puzzles with more than 500 pieces (see Note 1)	—
Fireworks including percussion caps, except percussion caps specifically designed for toys	Fireworks, including percussion caps which are not specifically designed for toys (see Note 1)	—
Products containing heating elements intended for use under the supervision of an adult in a teaching context	Products intended for use for educational purposes in schools and other pedagogical contexts under the surveillance of an adult instructor, such as science equipment (see Note 1)	—
Steam engines	Toy steam engines (see Note 2)	—
Video toys that can be connected to a video screen and operated at a nominal voltage greater than 24 V	—	—
Babies' pacifiers (dummies)	Babies' soothers (see Note 1)	—
Faithful reproduction of fire-arms	Reproductions of real fire arms (see Note 1)	—
Electric ovens, irons or other functional products operated at a nominal voltage greater than 24 V	Functional educational products, such as electric ovens, irons or other functional products, as defined in 2009/48/EC, operated at a nominal voltage exceeding 24 V which are sold exclusively for teaching purposes under adult supervision (see Note 1)	—
Bows for archery with an overall relaxed length exceeding 120 cm	Bows for archery over 120 cm long (see Note 1)	—
Fashion jewellery for children	Fashion accessories for children which are not for use in play (see Note 1)	—
—	Scoters and other means of transport designed for sport or which are intended to be used for travel on public roads or public pathways	Non-powered scooters (see Consumer Safety Specification F2264) Recreational powered scooters and pocket bikes (see Consumer Safety Specification F2641)
—	Electrically driven vehicles which are intended to be used for travel on public roads, public pathways, or the pavement thereof (see Note 1)	—
NOTE 1 For the purpose of EN 71-1, these product types are not considered as toys. There are guidance documents issued by CEN to assist in the classification of toys.		
NOTE 2 EN 71-1 does not apply to these toys.		

Table 2 (continued)

ISO 8124-1	EN 71-1	ASTM F963
—	Electronic equipment, such as personal computers and game consoles, used to access interactive software and their associated peripherals, unless the electronic equipment or the associated peripherals are specifically designed for and targeted at children and have a play value on their own, such as specially designed personal computers, key boards, joy sticks or steering wheels (see Note 1)	—
—	Interactive software, intended for leisure and entertainment, such as computer games, and their storage media, such as CDs (see Note 1)	—
—	Child-appealing luminaires (see Note 1)	—
—	Electrical transformers for toys (see Note 1)	—
—	—	Tricycles
—	—	Crayons, paints, chalks, and other similar art materials in which the material itself or the finished item is not primarily of play value, except that all art materials, whether or not a component of a toy, must comply with LHAMA, in accordance with 4.29.1 to 4.29.3.
—	—	Constant air inflatables
NOTE 1 For the purpose of EN 71-1, these product types are not considered as toys. There are guidance documents issued by CEN to assist in the classification of toys.		
NOTE 2 EN 71-1 does not apply to these toys.		

5 Comparison of terms and definitions

5.1 General

Table 3 illustrates the terms that are defined in the referenced standards.

Table 3 — Defined terms

ISO 8124-1	EN 71-1	ASTM F963
3.1 accessible	3.1 accessible	3.1.2 accessible
3.2 aquatic toy	3.3 aquatic toy	3.1.4 aquatic toy
3.3 arrow	3.2 arrow	3.1.5 arrow
3.4 backing	3.5 backing	—
3.5 ball	3.6 ball	3.1.7 ball
3.6 battery-operated toy	—	3.1.11 battery-operated toy

Table 3 (continued)

ISO 8124-1	EN 71-1	ASTM F963
3.7 burr	3.7 burr	3.1.12 burr
3.8 close-to-the-ear toy	3.11 close-to-the-ear toy	3.1.14 close-to-the-ear toy
3.9 collapse	3.12 collapse	3.1.16 collapse
3.10 cord	3.13 cord	3.1.19 cord
3.11 crushing	3.16 crushing	3.1.21 crushing
3.12 C-weighted peak sound pressure level (L_{pCpeak})	3.50 peak emission sound pressure level	3.1.13 C-weighted peak sound pressure level (L_{Cpeak})
3.13 dart	3.17 dart	—
3.14 discharge mechanism	3.18 discharge mechanism	3.1.24 discharge mechanism
3.15 driving mechanism	3.19 driving mechanism	—
3.16 edge	3.20 edge	3.1.22 curled edge
3.16.1 curled edge		3.1.41 hemmed edge
3.16.2 hemmed edge		3.1.75 rolled edge
3.16.3 rolled edge		
3.17 A-weighted equivalent sound pressure level (L_{pAeq})	3.72 time-averaged emission sound pressure level	3.1.1 A-weighted equivalent sound pressure level (L_{Aeq})
3.18 expanding material	3.24 expanding material	3.1.27 expanding material
3.19 explosive action	—	3.1.28 explosive action
3.20 fastener	3.25 fastening	3.1.30 fastener
3.21 feathering	—	3.1.31 feathering
3.22 flash	—	3.1.32 flash
3.23 folding mechanism		3.1.33 folding mechanism
3.24 free flight	3.30 free flight	3.1.34 free flight
3.25 functional magnet in electrical or electronic components of toys	3.33 functional magnet in electrical or electronic components of toys	—
3.26 functional toy	3.34 functional product 3.35 functional toy	—
3.27 fuzz	3.36 fuzz	3.1.35 fuzz
3.28 glass	—	—
3.29 hand-held toy	3.37 hand-held toy	3.1.36 hand-held toy
3.30 harm	—	—
3.31 hazard	—	3.1.37 hazard
3.32 hazardous projection	—	3.1.65 projection, hazardous
3.33 hazardous sharp edge	—	3.1.25 edge, hazardous
3.34 hazardous sharp point	—	3.1.57 point, hazardous
3.35 hinge-line clearance	3.38 hinge line	3.1.42 hinge-line clearance
3.36 lap joint	3.46 overlap joint	3.1.44 lap joint
3.37 large and bulky toy	3.39 large and bulky toy	3.1.45 large and bulky toy
3.38 leading edge	3.40 leading part	3.1.47 leading edge
3.39 marble	marble is covered by the definition of "balls" in EN 71-1	3.1.49 marble
3.40 magnetic component	3.41 magnetic component	3.1.38 hazardous magnet 3.1.39 hazardous magnetic component
3.41 magnetic/electrical experimental set	3.42 magnetic/electrical experimental set	3.1.48 magnetic/electrical experimental set

Table 3 (continued)

ISO 8124-1	EN 71-1	ASTM F963
3.42 maximum A-weighted sound pressure level (L_{pAFmax})	3.43 maximum emission sound pressure level	3.1.1 A-weighted equivalent sound pressure level (L_{pAeq}) 3.1.51 maximum A-weighted sound pressure level (L_{AFmax})
3.43 metal	—	—
3.44 normal use	—	3.1.53 normal use
3.45 packaging	3.47 packaging	3.1.55 packaging
3.46 paper	3.48 paper	A5.2.6 paper (applied to flammability requirement)
3.47 play furniture	—	—
3.48 pompom	—	3.1.58 pompom
3.49 projectile	3.53 projectile	3.1.62 projectile
3.50 projectile toy with stored energy	3.54 projectile toy with stored energy	3.1.63 projectile toy with stored energy
3.51 projectile toy without stored energy	3.55 projectile toy without stored energy	3.1.64 projectile toy without stored energy
3.52 protective cap, protective cover or protective tip	—	3.1.66 protective cap or cover 3.1.67 protective tip
3.53 pull or push toy	3.56 pull-along or push toy	3.1.68 push/pull toy
3.54 rattle	3.57 rattle	3.1.69 rattle
3.55 reasonably foreseeable abuse	—	3.1.70 reasonably foreseeable abuse
3.56 reference box	—	3.1.71 reference box
3.57 removable component	3.58 removable component	—
3.58 resilient material	—	—
3.59 rigidity	—	3.1.73 rigid
3.60 risk	—	—
3.61 simulated protective equipment	—	3.1.79 simulated protective equipment
3.62 soft-filled toy, stuffed toy	3.61 soft-filled toy	3.1.80 soft-filled toy/stuffed toy
3.63 splinter	3.62 splinter	3.1.81 splinter
3.64 springs	3.63 spring	3.1.40 helical spring
3.64.1 helical spring	3.63.1 helical spring	3.1.17 compression spring
3.64.1.1 compression helical spring	3.63.2 compression spring	3.1.30 extension spring
3.64.1.2 extension helical spring	3.63.3 extension spring	3.1.82 spiral spring
3.64.2 spiral spring	3.63.4 spiral spring	—
3.65 squeeze toy	3.64 squeeze toy	3.1.83 squeeze toy
3.66 table-top, floor and crib toy	3.68 table-top or floor toy	3.1.87 tabletop, floor, and crib toy
3.67 teether	3.71 teether	3.1.89 teether
3.68 tool	3.73 tool	3.1.90 tool
3.69 toy	—	3.1.91 toy
3.70 toy bicycle	3.75 toy bicycle	—
3.71 toy chest	—	3.1.92 toy chest
3.72 toy scooter	3.77 toy scooter	—
3.73 elastic	3.21 elastic material	3.1.26 elastic
3.74 fixed loop	3.28 fixed loop	—

Table 3 (continued)

ISO 8124-1	EN 71-1	ASTM F963
3.75 tangled loop	3.69 tangled loop	—
3.76 noose	3.45 noose	—
3.77 ribbon	3.60 ribbon	—
3.78 strap	3.65 strap	3.1.85 strap
3.79 tape	3.70 tape	—
3.80 electrical cable	3.22 electrical cable	—
3.81 yo-yo ball	3.81 yo-yo ball	3.1.94 yo yo elastic tether toy
3.82 cord with potential to tangle	3.15 cord or chain with the potential to tangle	3.1.88 tangle or form a loop
3.83 chain	3.9 chain	—
3.84 steady-state sound	—	3.1.84 steady-state sound (noise)
3.85 paperboard	3.49 paperboard	—
—	3.4 asphyxiation	—
—	3.8 cap-firing toy	—
—	3.10 choking	—
—	3.14 crack	—
—	3.23 emission sound pressure level	—
—	3.26 filling	—
—	3.27 fixed drive	—
—	3.29 flying toy	—
—	3.31 free-wheeling mechanism	—
—	3.32 functional edge or point	—
—	3.44 maximum saddle height	—
—	3.51 percussion toy	—
—	3.52 plastic sheeting	—
—	3.59 remote controlled flying toy	—
—	3.66 suction cup	—
—	3.67 suffocation	—
—	3.74 toy bag	—
—	3.79 voice toy	—
—	3.80 wind toy	—
—	—	3.1.46 latex balloon
—	—	3.1.56 pinching
—	—	3.1.61 principal display panel
—	—	3.1.74 rigid leading edge
—	—	3.1.93 toy seat

5.2 Analysis of the main differences between the terms and definitions

5.2.1 Aquatic toy

EN 71-1 does not specifically exclude bathroom toys and beach balls, as shown in [Table 4](#).

Table 4 — Aquatic toy definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.2 aquatic toy</p> <p>article, whether inflatable or not, intended to bear the mass of a child and used as an instrument of play in shallow water</p> <p>Note 1 to entry: Bathroom toys and beach balls are not considered aquatic toys</p>	<p>3.3 aquatic toy</p> <p>toy, whether inflatable or not, intended for use in shallow water and which is capable of carrying or supporting a child on the water</p>	<p>3.1.4 aquatic toy</p> <p>an article, whether inflatable or not, intended to bear the mass of a child and used as an instrument of play in shallow water. This does not include bath toys, beach balls, and United States Coast Guard-approved life saving devices</p>

5.2.2 Asphyxiation and choking

EN 71-1 defines asphyxiation and choking. ISO 8124-1 does not provide definitions, although these terms are mentioned in ISO 8124-1:2018, Annex E.

5.2.3 Ball

The definition of ball in ASTM F963 is somewhat narrower than in EN 71-1 and ISO 8124-1 because it requires meeting parameters for both shape and function. See [Table 5](#).

Table 5 — Ball definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.5 ball</p> <p>spherical, ovoid or ellipsoidal object, usually but not always designed or intended to be thrown, hit, kicked, rolled, dropped or bounced</p>	<p>3.6 ball</p> <p>spherical, ovoid or ellipsoidal object, usually but not always designed or intended to be thrown, hit, kicked, rolled, dropped or bounced</p>	<p>3.1.7 ball</p> <p>any spherical, ovoid, or ellipsoidal object that is designed or intended to be thrown, hit, kicked, rolled, dropped, or bounced. The term “ball” includes any spherical, ovoid, or ellipsoidal object that is attached to a toy or article by means of string, elastic cord, or similar tether. The term “ball” also includes any multisided object formed by connecting planes into a generally spherical ovoid, or ellipsoidal shape that is designated or intended to be used as a ball. The term “ball” does not include dice, or balls permanently enclosed inside pinball machines, mazes, or similar outer containers. A ball is permanently enclosed if, when tested in accordance with 16 CFR 1500.53, it is not removed from the outer container</p>

5.2.4 Close-to-the-ear toy

In [Table 6](#), EN 71-1 defines a close-to-the-ear toy as one that is intended to be used within 2,5 cm of the ear.

Table 6 — Close-to-the-ear toy definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.8 close-to-the-ear toy</p> <p>toy that is intended to be used close to the ear, i.e. the sound-emitting part of such a toy is normally put against the ear of a child</p> <p>EXAMPLE Toy cellphones or toy telephones that emit sounds from the hand piece</p>	<p>3.11 close-to-the-ear toy</p> <p>toy clearly designed to emit sound, intended to be used within 2,5 cm of the ear</p> <p>Note 1 to entry: Examples of close-to-the-ear toys are toy telephones and toy rifles with a loudspeaker in the stock</p>	<p>3.1.14 close-to-the-ear toy</p> <p>a toy that is intended to be used close to the ear, that is, the sound emitting part of such a toy is normally put against the ear of a child (example—toy telephones that emit sounds from the earpiece)</p>

5.2.5 Cord

ISO 8124-1 and EN 71-1 define cord as flexible textile or non-textile material. They also clarify that electrical cables used for connecting a toy to a supply of electricity or to a piece of electronic equipment which is not itself a toy or part of a toy are not considered to be cords, while accessible electric wires (e.g. between a battery box and a sound source in a soft-filled toy) which are not electrical cables are, however considered to be cords. ASTM F963 does not include “chain” and “certain weak and long springs” in the definition of cord. See [Table 7](#).

Table 7 — Cord definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.10 cord</p> <p>narrow piece of flexible textile or non-textile material, the length of which is significantly greater than the thickness and width</p> <p>EXAMPLE Cord includes elastic material, monofilament polymeric material, tape, ribbon, rope, strap, chain, woven and twisted material and string, as well as certain weak and long springs</p> <p>Note 1 to entry: Electrical cables (see 3.81) are not considered to be cords. Accessible electrical wires (e.g. between a battery box and a sound source in a soft filled toy) which are not electrical cables are, however, considered to be cords</p>	<p>3.13 cord</p> <p>narrow piece of flexible textile or non-textile material of which the length is significantly greater than its thickness and width</p> <p>EXAMPLE examples of cords include elastic material, monofilament polymeric material, tape, ribbon, rope, strap, woven and twisted material and string as well as certain weak and long springs</p> <p>Note 1 to entry: Electrical cables (see 3.22) are not considered to be cords. Accessible electrical wires (e.g. between a battery box and a sound source in a soft filled toy) which are not electrical cables are however considered to be cords</p>	<p>3.1.19 cord</p> <p>a length of slender, flexible material including monofilaments, woven and twisted cord, rope, plastic textile tapes, ribbon, and those fibrous materials commonly called string</p>

5.2.6 Elastic

ISO 8124-1 and EN 71-1 do not specify the conditions for recovery from elongation. See [Table 8](#).

Table 8 — Elastic definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.73 elastic</p> <p>material or item that is stretchable when subjected to an external force and which is able to recover or nearly recover its original length or shape when the force is removed</p>	<p>3.21 elastic material</p> <p>material or item that is stretchable when subjected to an external force and which is able to recover or nearly recover its original length or shape when the force is removed</p>	<p>3.1.26 elastic</p> <p>material that will recover its former size and shape essentially and instantaneously after being elongated at least 10 % at a testing speed of not less than 20 in. (510 mm)/min</p>

5.2.7 Hand-held toy

The definition in EN 71-1 includes exemptions for toys with certain hand-held features, such as close-to-the-ear toys, rattles, squeeze toys, cap-firing toys, wind toys, voice toys and percussion toys. ISO 8124-1 and ASTM F963 include cap-firing toys. See [Table 9](#).

Table 9 — Hand-held toy definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.29 hand-held toy</p> <p>toy that is intended to be used or operated while being held in the hand</p> <p>EXAMPLE Toy tools, small electronic games, stuffed animals, dolls, musical toys and cap-firing toys</p>	<p>3.37 hand-held toy</p> <p>toy clearly designed to emit sound, intended to be held in the hand but excluding close-to-the-ear toys, rattles, squeeze toys, cap-firing toys, wind toys, voice toys and percussion toys</p> <p>NOTE 1 to entry: Examples of hand-held toys are clicking toys, toy tools, and toys guns</p>	<p>3.1.36 hand-held toy</p> <p>a toy that is intended to be used or operated while being held in the hand. Examples include toy tools, small electronic games, stuffed animals, dolls, musical toys, and cap-firing toys</p>
<p>NOTE The definitions in ISO 8124-1 and ASTM F963 are exclusively applied to acoustic requirements on toys designed to emit sound.</p>		

5.2.8 Hazard

ISO 8124-1 provides examples of hazards. See [Table 10](#).

Table 10 — Hazard definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.31 hazard</p> <p>potential source of harm</p> <p>Note 1 to entry: The term hazard can be qualified in order to define its origin or the nature of the expected harm (i.e. electric shock hazard, crushing hazard, cutting hazard, toxic hazard, fire hazard or drowning hazard)</p>	<p>—</p> <p>NOTE 1</p> <p>It is stated clause 7.2 of EN 71-1 defines the hazard as a potential source of harm</p>	<p>3.1.37 hazard</p> <p>any characteristic of a toy that presents an unreasonable risk of injury or illness during normal use or as a result of reasonably foreseeable abuse</p>

5.2.9 Large and bulky toy

The definition of large and bulky toy in ASTM F963 does not include consideration of the toy's mass (4,5 kg or more), while mass is one of the factors that can define a toy as large and bulky in ISO 8124-1 and EN 71-1. See [Table 11](#).

Table 11 — Large and bulky toy definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.37 large and bulky toy</p> <p>toy that has a projected base area of more than 0,26 m² or a volume of more than 0,08 m³ calculated without regard to minor appendages, or a mass of 4,5 kg or more</p> <p>Note 1 to entry: The base area for toys having permanently attached legs is measured by calculating the area enclosed by straight lines connecting the outermost edge of each leg of the perimeter</p>	<p>3.39 large and bulky toy</p> <p>toy that has a projected base area of more than 0,26 m² or a volume of more than 0,08 m³ calculated without regard to minor appendages, or a mass of 4,5 kg or more</p> <p>Note 1 to entry: The base area of a toy having permanently attached legs is the area enclosed by straight lines connecting the outermost edge of each leg of the perimeter</p>	<p>3.1.45 large and bulky toy</p> <p>toy that has a projected base area of more than 400 in² (0,26 m²) or a volume of more than 3ft³ (0,08 m³) calculated without regard to minor appendages</p> <p>NOTE 2 The base area for toys having permanently attached legs is measured by calculating the area enclosed by straight lines connecting the outermost edge of each leg of the perimeter</p>
NOTE In ASTM F963, consideration of toy mass is made during the application of the drop test.		

5.2.10 Marble

Marble is defined differently in ASTM F963 and ISO 8124-1. ASTM F963 excludes a marble that is permanently enclosed in a toy or game, while ISO 8124-1 does not make this distinction. EN 71-1 does not define marble; however, marble is covered by the definition of ball in that standard. See [Table 12](#).

Table 12 — Marble definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.39 marble</p> <p>sphere made of hard material, such as glass, agate, marble or plastic, which is used in various children's games, generally as a playing piece or marker</p>	—	<p>3.1.49 marble</p> <p>a sphere made of a hard material, such as glass, agate, marble, or plastic, that is used in various children's games, generally as a playing piece or marker. The term "marble" does not include a marble permanently enclosed in a toy or game. A marble is permanently enclosed if, when tested in accordance with 16 CFR 1500.53, it is not removed from the toy or game</p>

5.2.11 Paper

In ISO 8124-1 and EN 71-1, paper is defined as a sheet formed by irregularly intervened cellulose fibres with a mass per unit area of 400 g/m² or less. ASTM F963:2017, Annex 5 has a definition for paper, but no numerical parameters are included and the definition is limited to the flammability testing procedure. See [Table 13](#).

Table 13 — Paper definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.46 paper</p> <p>sheet formed by irregularly inter-vened cellulose fibres with a mass per unit area of 400 g/m² or less</p> <p>Note 1 to entry: If paper with polymeric lamination, or other treatments which may be resistant to wetting, no longer presents the same properties as paper, then it is not treated as such</p>	<p>3.48 paper</p> <p>sheet formed by irregularly inter-vened cellulose fibres with a mass per unit area of 400 g/m² or less</p> <p>A.26 in the EN 71-1: It should be noted that some paper and paper-board components have polymeric lamination, thick coatings like varnish, or other treatments which may mean they are more resistant to wetting with an increased potential choking hazard as a result</p>	<p>A5.2.6 paper</p> <p>a thin, flat, single layer of material produced by the compression of fibers. The fibers are usually composed of cellulose. Examples of paper products are traditional playing cards, newspaper, magazines, and construction paper. Examples of products that are not paper are cardboard, and paperboard (multiple layers of paper bonded together)</p>

5.2.12 Pompom

In ISO 8124-1, the definition of pompom includes substantially spherical, ovoid or ellipsoidal shapes, while ASTM F963 only references a spherical shape. ISO 8124-1 notes that tassels with long strands are not considered pompoms and provides images for reference. EN 71-1 does not include a definition for pompoms. See [Table 14](#).

Table 14 — Pompom definitions

ISO 8124-1	ASTM F963
<p>3.48 pompom</p> <p>lengths or strands of fibre, yarn or thread clamped or secured and tied in the centre, and brushed up to form a substantially spherical, ovoid or ellipsoidal shape</p> <p>Note 1 to entry: This definition includes substantially spherical-, ovoid-, and ellipsoidal-shaped attachments made of stuffed materials (see Figure 5)</p> <p>Note 2 to entry: Tassels with long strands are not considered pompoms (see Figure 6)</p>	<p>3.1.58 pompom</p> <p>lengths or strands of fiber, yarns, or threads clamped or secured and tied in the center, and brushed up to form a spherical shape. Also included are spherical shaped attachments made of stuffed material</p>

5.2.13 Projectile

The definition of projectile in ISO 8124-1 and ASTM F963 states that a projectile does not include self-propelled flying toys. See [Table 15](#).

Table 15 — Projectile definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.49 projectile</p> <p>object without capacity for self-propulsion, intended to be launched into free flight</p> <p>Note 1 to entry: The definition does not include self-propelled flying toys such as remote control helicopters and wind-up airplanes unless the capacity for self-propulsion is from self-contained compressed gas and/or liquid (e.g. rockets)</p>	<p>3.53 projectile</p> <p>object intended to be launched, thrown or released into free flight or trajectory in the air</p> <p>Note 1 to entry: This includes objects where the travel is ultimately constrained by means of a tether (e.g. pop-gun)</p>	<p>3.1.62 projectile</p> <p>an object intended to be launched into a free flight</p> <p>3.1.62.1 Discussion</p> <p>This does not include self-propelled flying toys such as remote control helicopters and wind-up airplanes. (See Rationale for additional explanation)</p>

5.2.14 Projectile toy with stored energy

Compared to EN 71-1, the definition of projectile toy with stored energy in ISO 8124-1 and ASTM F963 provides additional detail regarding the discharge mechanism. See [Table 16](#).

Table 16 — Projectile toy with stored energy definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.50 projectile toy with stored energy</p> <p>toy with a projectile launched by means of a discharge mechanism capable of storing energy independent of the user and incorporating a release mechanism</p> <p>Note 1 to entry: Release mechanisms should operate following at least one single discrete activation by the user.</p> <p>Note 2 to entry: Toy rockets and similar toys propelled by a chemical reaction or compressed gases (e.g. air) where the energy can be stored independent of the user are considered as projectile toys with stored energy. For example, in a rocket propelled by a mixture of vinegar and baking soda, the user initiates the reaction by mixing the two substances but no longer has control of the actual launching. The rocket will launch when the pressure build up overcomes the force that holds the rocket onto the launch platform</p>	<p>3.54 projectile toy with stored energy</p> <p>toy with a projectile launched by means of a discharge mechanism capable of storing energy independent of the user and incorporating a release mechanism</p>	<p>3.1.63 projectile toy with stored energy</p> <p>toy with a projectile launched by means of a discharge mechanism capable of storing energy independent of the user and typically requiring at least one discrete action by the user to launch the projectile</p> <p>3.1.63.1 Discussion</p> <p>This includes toy rockets and similar toys propelled by a chemical reaction or compressed gasses (for example, air) where the energy can be stored independent of the user. For example, in a rocket propelled by a mixture of vinegar and baking soda, the user initiates the reaction by mixing the two substances but no longer has control of the actual launching. The rocket will launch when the pressure build up overcomes the force that holds the rocket onto the launch platform</p>

5.2.15 Protective cap, protective cover or protective tip

ASTM F963 provides definitions for the terms protective cap or cover (see ASTM F963:2017, 3.1.66) and protective tip (see ASTM F963:2017, 3.1.67). ISO 8124-1 combines them into one definition, listed as protective cap, protective cover or protective tip. EN 71-1 does not specifically define these terms, but uses the phrase “protective components” within the standard. See [Table 17](#).

Table 17 — Protective cap, protective cover or protective tip definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.52 protective cap, protective cover or protective tip</p> <p>component that is attached to a potentially hazardous edge or projection to reduce the risk of injury</p>	—	<p>3.1.66 protective cap or cover</p> <p>a component that is attached to a potentially hazardous edge or projection to reduce the possibility of injury</p> <p>3.1.67 protective tip</p> <p>a component that is attached to the impacting end of a projectile to minimize injury if it should impact on the body, and also to prevent damage to the projectile upon striking a target, provide a means of attaching the projectile to the target as in the case of suction cups, or prevent damage to inanimate objects</p>

5.2.16 Pull or push toy

In ISO 8124-1, pull or push toy is defined as a toy that is intended to be pulled or pushed along the floor or ground. In EN 71-1, pull-along or push toy is defined as a toy on which movement is imparted by the user, for example by pulling it by a cord or pushing it by means of a rigid extension. In ASTM F963, push/pull toy is defined as a toy with a cord/tether or a handle attached to the toy and where the toy is intended for use on the ground with the child in a standing/upright position, typically walking, while using the toy. The definition of push/pull toy in ASTM F963 provides more details than ISO 8124-1 or EN 71-1.

In addition, ISO 8124-1 clarifies that toys intended for children aged 36 months and over are not regarded as pull or push toys. See [Table 18](#).

Table 18 — Pull or push toy definitions

ISO 8124-1	EN 71-1	ASTM F963
<p>3.53 pull or push toy</p> <p>toy that is intended to be pulled or pushed along the floor or ground</p> <p>Note 1 to entry: Toys intended for children aged 36 months and over are not regarded as pull or push toys</p>	<p>3.56 pull-along or push toy</p> <p>toy on which movement is imparted by the user for example by pulling it by a cord or pushing it by means of a rigid extension</p>	<p>3.1.68 push/pull toy</p> <p>a toy with a cord/tether or a handle attached to the toy and where the toy is intended for use on the ground with the child in a standing/upright position, typically walking, while using the toy</p>

5.2.17 Rattle

There is a difference in the applicable age range for rattles across the referenced standards. ASTM F963 is applicable for children under 18 months, while EN 71-1 and ISO 8124-1 use “children who are too young to sit up unaided” with the clarification, in the annexes of both standards, that children normally start to sit up unaided between the ages of five months and 10 months. See [Table 19](#).

Table 19 — Rattle definitions

ISO 8124-1	EN 71-1	ASTM F963
3.54 rattle toy that is clearly designed to emit sound when shaken, typically intended for children who are too young to sit up unaided	3.57 rattle toy, intended for children who are too young to sit up unaided, that is clearly designed to emit sound when shaken or activated by the child or another person	3.1.69 rattle a toy that is clearly designed to emit sound when shaken typically intended for children under 18 months

5.2.18 Toy scooter

In EN 71-1, toy scooter is defined as a ride-on toy that is not intended for sport or to be used for travel on public roads or public pathways.

EN 71-1 only covers products powered by muscular action while ISO 8124-1 allows for power by other means. See [Table 20](#).

Table 20 — Toy scooter definitions

ISO 8124-1	EN 71-1	ASTM F963
3.72 toy scooter ride-on toy which is propelled by the muscular action of the user or other means and may be foldable or not, intended for children with a body mass of 50 kg or less and comprised of at least one platform for standing, at least two wheels, and a steering system equipped with an adjustable or fixed-length steering tube Note 1 to entry: The definition includes foldable and non-foldable toy scooters	3.77 toy scooter ride-on toy, not intended for sport or to be used for travel on public roads or public pathways, which is propelled by the muscular action of the user and may be foldable or not, intended for children with a body mass of 50 kg or less, comprising at least one platform for standing, at least two wheels, and a steering system equipped with an adjustable or fixed-length steering tube	—

5.2.19 Squeeze toy

There is a difference in the applicable age range for squeeze toys across the referenced standards, as shown in [Table 21](#). ASTM F963 and ISO 8124-1 are applicable for toys intended for children under 18 months, while EN 71-1 applies to “children who are too young to sit up unaided”.

The definition in EN 71-1 does not discuss the ability of the toy to recover its original shape when released. See [Table 21](#).

Table 21 — Squeeze toy definitions

ISO 8124-1	EN 71-1	ASTM F963
3.65 squeeze toy hand-held pliable toy, usually incorporating a noise-making feature activated by forcing air through an opening when flexed or squeezed and which usually recovers its original shape when released	3.64 squeeze toy pliable toy, intended for children who are too young to sit up unaided, incorporating a sound-making feature activated by forcing air through an opening, clearly designed to emit sound when flexed or squeezed by the child or another person	3.1.83 squeeze toy a handheld pliable toy, intended for children under the age of 18 months, usually incorporating a noise-making feature activated by forcing air through an opening when flexed or squeezed, and which recovers to its original shape when released
NOTE ISO 8124-1:2018, 4.5.1.2 only applies to squeeze toys intended for children under 18 months.		

6 Comparison of requirements

6.1 General

The comparisons in this clause are based on the requirements in ISO 8124-1; they focus on the main differences between the referenced standards.

For the purpose of this document, the subclauses related to warnings and test methods are included in the general requirements section.

6.2 Normal use

The clauses for normal use requirements in the referenced standards are indicated in [Table 22](#).

Table 22 — Normal use clauses

ISO 8124-1	EN 71-1	ASTM F963
4.1 Normal use	1 scope	8.5 Normal use testing
5.23 Washable toys	A.26 General requirements for toys intended for children under 36 months (see 5.1)	8.5.1 Washable toys 8.5.1.1 Conditions for machine washing and tumble drying

The normal use testing in ASTM F963 provides more details than the testing specified in ISO 8124-1 and EN 71-1. Different requirements for normal use are shown in [Table 23](#).

Table 23 — Requirements for normal use

ISO 8124-1	EN 71-1	ASTM F963
<p>All toys shall be tested in accordance with the relevant tests in 5.1 (general) to 5.22 (folding or sliding mechanisms) in order to ensure that risks as a result of normal wear and/or deterioration are minimized</p> <p>After normal use testing, the toy shall continue to conform to the relevant requirements of Clause 4 (requirements)</p>	<p>Refers to new toys, taking into account the period of foreseeable and normal use, and that the toys are used as intended or in a foreseeable way, bearing in mind the behaviour of children</p>	<p>Normal use testing. These tests are intended to simulate normal use conditions so as to ensure that hazards are not generated through normal wear and deterioration. The object of these tests shall be to simulate the normal play mode of the toy, and the tests are therefore unrelated to the reasonably foreseeable abuse tests of 8.6 – 8.13. The tests are intended to uncover hazards rather than to demonstrate the reliability of the toy. The fact that a mechanism or material of a toy fails during testing is relevant only if the failure creates a potential hazard. Toys shall be subject to appropriate tests to simulate the expected mode of use of the particular toy. For example, levers, wheels, catches, triggers, strings, wires, chains, and so on, that are intended to be actuated by a child shall be operated repeatedly. Spring or power-operated devices shall be tested similarly. The tests shall be conducted in an expected use environment. For example, toys intended for use in the bathtub shall be tested in soapy water, and toys intended for use in the sandbox shall be exposed to sand during testing. It is recognized that no specific requirements are defined here; it would not be possible in view of the wide range of toys covered by this specification. However, the manufacturer or distributor shall do enough testing to satisfy himself that normal use during the estimated lifetime of the toy is being simulated. The toy shall be inspected after such tests, and hazards such as points, sharp edges, and release of small parts shall be evaluated in accordance with the relevant requirements listed in Section 4</p>

6.3 Reasonably foreseeable abuse

The clauses for reasonably foreseeable abuse in the referenced standards are indicated in [Table 24](#).

Table 24 — Reasonably foreseeable abuse clauses

ISO 8124-1	EN 71-1	ASTM F963
4.2 Reasonably foreseeable abuse	—	8.6 Abuse testing
5.24 Reasonably foreseeable abuse tests		
5.24.2 Drop test	8.5 Drop test (see 4.5, 4.6, 4.10.2, 4.14.2, 4.22, 4.23.2, 4.25, 5.1, 5.10, 5.12 and 5.13)	8.7.1 Drop test
—	—	8.7.3 Tumble test for wheeled toys
5.14 Impact test for toys that cover the face	4.14.2 b) 8.7 Impact test (see 4.14.2)	8.7.4 Impact test for toys that cover the face
5.24.3 Tip-over test for large and bulky toys	8.6 Tip over test (see 4.10.2, 4.22, 4.23.2, 5.1, 5.10, 5.12 and 5.13)	8.7.2 Tipover test for large, bulky toys

Table 24 (continued)

ISO 8124-1	EN 71-1	ASTM F963
5.33 Impact test for magnets	8.7 Impact test (see 4.5, 4.6, 4.10.2, 4.22, 4.23.2, 4.25, 5.1, 5.10, 5.12, 5.13 and A.38)	8.25.4.6 Impact test (for magnet toy)
5.24.4 Dynamic strength test for wheeled ride-on toys other than toy scooters	8.22 Dynamic strength (see 4.15.1.3)	8.21 Dynamic strength test for wheeled ride-on toys
5.24.5 Torque test	8.3 Torque test (see 4.6, 4.11, 4.14.2, 4.17, 4.18, 4.22, 4.23.2, 4.25, 5.1, 5.10, 5.12, 5.13 and Clause 6)	8.8 Torque tests for removal of components
5.24.6 Tension test	8.4 Tension test (see A.37)	8.9 Tension test for removal of components
5.24.6.1 General procedure	8.4.2.1 General (see 4.6, 4.11, 4.14.2, 4.17, 4.18, 4.22, 4.23, 4.25, 5.1, 5.3, 5.10, 5.12, 5.13 and Clause 6)	—
5.24.6.2 Tension test for seams in soft-filled (stuffed) toys, bean-bag-type toys, and other similar filled toys	8.4.2.2 Seams and materials (see 4.23.2 and 5.2)	8.9.1 Tension test for seams in stuffed toys and beanbag-type toys
5.24.6.3 Tension test for pompoms	—	—
5.24.6.4 Tension test for protective components	8.4.2.3 Protective components (see 4.9 and 4.17.1)	—
5.24.6.5 Tension test for a projectile with a suction cup	8.4.2.4 Tension test for a projectile with a suction cup	8.9.2 Tension test for suction cups on projectiles
—	8.4.2.6 Perpendicular tension test for rotors and propellers	—
—	8.4.2.7 Tension test for rotors and propellers	—
5.24.7 Compression test	8.8 Compression test (see 4.6, 4.14.2, 4.22, 4.23.2, 4.25, 5.1, 5.10, 5.12, 5.13 and A.39)	8.10 Compression test 8.25.4.7 Compression test (for magnet toy)
—	8.9 Soaking test (see 4.11, 4.23.2, 5.1, 5.10 and 5.12)	—
5.24.8 Flexure test	8.13 Flexibility of metallic wires (see 4.8 and A.41)	8.12 Flexure test
—	—	8.11 Tests for tire removal and snap-in wheel and axle assembly removal
5.34 Soaking test for magnets	8.9 Soaking test (See 4.11, 4.23.2, 5.1, 5.10 and 5.12)	8.25.4.1 Soaking test for magnets

- a) The reasonably foreseeable abuse test parameters in ISO 8124-1, EN 71-1 and ASTM F963 are determined according to the age grade of the toy, as shown in [Table 25](#). For the drop test, ISO 8124-1 and ASTM F963 include toy mass criteria; a toy is not subjected to this test if its mass exceeds the upper threshold. EN 71-1 does not include toy mass criteria for exemption from the drop test; however, some clauses substitute the drop test with the tip over test (e.g. 5.1 d), when the toy is large and bulky, as defined in EN 71-1:2014+A1:2018, 3.39.

Table 25 — Parameters for reasonably foreseeable abuse tests

		0 to 18 months	18+ to 36 months	36+ to 96 months
Drop test	ISO 8124-1	10 × (138 ± 5) cm (<1,4 kg)	4 × (93 ± 5 cm) (<4,5 kg)	
	EN 71-1	5 × (850 ± 50) mm		
	ASTM F963	10 × 4,5 ft ± 0,5 in. (137 cm) (<1,4 kg)	4 × 3,0 ft ± 0,5 in. (91 cm) (<1,8 kg)	4 × 3,0 ft ± 0,5 in. (91 cm) (<4,5 kg)
Torque test^a	ISO 8124-1	(0,45 ± 0,02) N·m		
	EN 71-1	0,34 N·m		
	ASTM F963	2 ± 0,2 in.·lbf (0,23 N·m)	3 ± 0,2 in.·lbf (0,34 N·m)	4 ± 0,2 in.·lbf (0,45 N·m)
Tension test^a	ISO 8124-1	General tension test (70 ± 2) N Tension test for seams (70 ± 2) N Tension test for pompoms (70 ± 2) N Tension test for protective components (70 ± 2) N		
	EN 71-1	The largest accessible dimension of the component to be gripped and tested is 6 mm or less (50 ± 2) N The largest accessible dimension of the component to be gripped and tested is greater than 6 mm (90 ± 2) N The component to be gripped is made entirely of paperboard (25 ± 2) N Tension test for seams (70 ± 2) N Tension test for protective components (60 ± 2) N		
	ASTM F963	10 ± 0,5 lbf (44,5 N)	15 ± 0,5 lbf (66,8 N)	15 ± 0,5 lbf (66,8 N)
Compression Test^a	ISO 8124-1	(114 ± 2,0) N		(136 ± 2,0) N
	EN 71-1	(110 ± 5) N		
	ASTM F963	20 ± 0,5 lbf (89,0 N)	25 ± 0,5 lbf (111,3 N)	30 ± 0,5 lbf (133,5 N)
Impact Test	ISO 8124-1	Impact test for toys that cover the face: Drop a steel ball with a diameter of (16 ± 0,15) mm and mass of (16,9 ± 0,7) g from a height of (130 ± 0,5) cm		
		Impact test for magnets: Drop a metallic weight with a mass of (1 ± 0,02) kg, distributed over a diameter of (80 ± 2) mm, through a distance of (100 ± 2) mm		
	EN 71-1	Drop a metallic weight with a mass of (1 ± 0,02) kg, distributed over an area with a diameter of (80 ± 2) mm, through a distance of (100 ± 2) mm		
ASTM F963	Impact Test for Toys that Cover the Face: Drop a 5/8-in. (16-mm) diameter steel ball weighing 0,56 oz. (15,8 g) (with a tolerance of +0,03 (0,8 g, -0 oz) from a height of 50 in. (1,3 m)			
	Impact Test for magnets: Drop a metallic weight with a mass of (1,0 ± 0,02) kg distributed over an area with a diameter of (80 ± 2) mm through a distance of (100 ± 2) mm			
Flexure test^a	ISO 8124-1	(70 ± 2) N		
	EN 71-1	(70 ± 2) N		
	ASTM F963	10 ± 0,5 lbf (44,5 N)	15 ± 0,5 lbf (66,8 N)	15 ± 0,5 lbf (66,8 N)

^a The tests in EN 71-1 are applicable to toys intended for children under 36 months or as specified by certain requirements.

- b) EN 71-1 provides a method to determine if a component can be gripped by inserting the feeler gauge between the component and the underlying layer or body of the toy at an angle between 0° and 10° from the toy surface using a force of (10 ± 1) N. If the gauge can be inserted more than 2 mm, the component shall be considered as grippable. There is no such method in ISO 8124-1 and

ASTM F963. ASTM F963 and ISO 8124-1 apply the tension test to any projection of a toy that a child can grasp with at least the thumb and forefinger or the teeth.

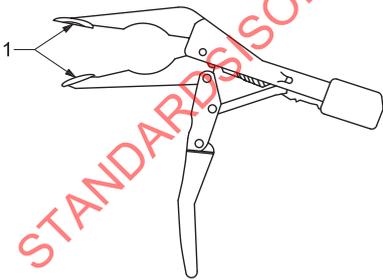
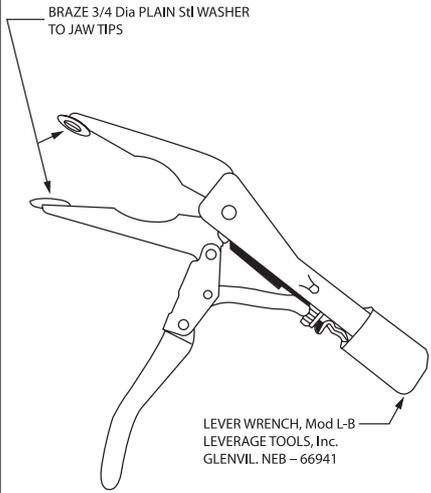
- c) Only ASTM F963 specifies a tumble test for wheeled toys.
- d) The soaking test in EN 71-1 is applied to toys with magnets, wooden toys, toys intended to be used in water and mouth-actuated toys. The soaking test in ISO 8124-1 and ASTM F963 is limited to toys with magnets.
- e) [Table 26](#) indicates the impact medium specifications for the drop test across the referenced standards.

Table 26 — Impact medium specifications for the drop test

	ISO 8124-1	EN 71-1	ASTM F963
Impact medium composition	Vinyl composition tile of approximately 3 mm nominal thickness laid over concrete of at least 64 mm thickness	4 mm thick steel plate with a 2 mm thick coating and placed on a non-flexible horizontal surface	The impact medium shall consist of a 1/8 in. (3 mm) nominal thickness of Type IV vinyl composition tile, composition 1-asbestos free, as specified in Federal Specification SS-T-312B over at least a 2,5 in. (64 mm) thickness of concrete
Hardness	(80 ± 10) Shore A	(75 ± 5) Shore A	—
Area	≥0,3 m ²	—	≥3 ft ² (0,3 m ²)

- f) The seam clamp specified in the referenced standards is very similar between the referenced standards, as shown in [Table 27](#). The key difference exists in whether washers or discs are affixed to the jaws of the clamp. The jaws in ASTM F963 have washers affixed to them, whereas the jaws in EN 71-1 and ISO 8124-1 have discs.

Table 27 — Seam clamps

ISO 8124-1	EN 71-1	ASTM F963
<p>Clamps with jaws to which discs with a diameter of 19 mm are attached</p>  <p>1 Flat Discs</p>	<p>Clamps with jaws to which discs with a diameter of 19 mm are affixed</p>	<p>Clamps with jaws to which are attached 3/4 in. (19 mm) diameter washers</p>  <p>FIG. 27 Seam Clamp</p>

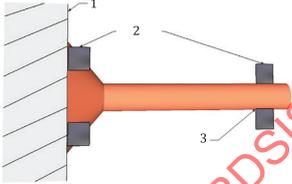
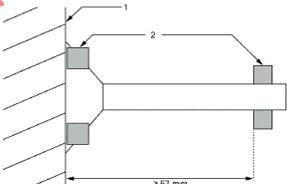
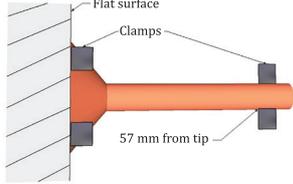
- g) The tip over tests in ISO 8124-1 and EN 71-1 provide more detail than the test specified in ASTM F963. In ISO 8124-1 and EN 71-1 the value of force to be applied (≤ 120 N) and its position (1 500 mm or top edge of the toy) are specified. See [Table 28](#).

Table 28 — Tip over tests

ISO 8124-1	EN 71-1	ASTM F963
Place the toy on a horizontal surface. Attempt to tip it over by pushing it slowly past its centre of balance three times, one of which shall be in its most onerous position	Place the toy on a horizontal surface and attempt to tip it over by pushing the toy slowly past its centre of balance three times, one of which shall be in its most onerous position	Toys shall be tested for impact by tipping over three times, one of which is in the worst attitude by pushing the sample slowly past its centre of balance onto the impact medium
Gradually apply a force, which is not to exceed 120 N, in a horizontal direction and 1 500 mm above the horizontal surface or at the top edge of the toy for toys less than 1 500 mm in height	By gradually applying a force, which is not to exceed 120 N, in a horizontal direction and 1 500 mm above the horizontal surface or at the top edge of the toy for toys less than 1 500 mm in height	
A non-resilient step with a height of (25 ± 2) mm shall be positioned such that it prevents sliding or rolling of the toy during the test	A non-resilient step with a height of (25 ± 2) mm shall be positioned such that it prevents sliding or rolling of the toy during the test	

- h) The tension test for suction cups on projectiles in ISO 8124-1 differs from EN 71-1 and ASTM F963 by having a zero value for the negative tolerance of the 57 mm clamping position. See [Table 29](#).

Table 29 — Clamping position for projectiles with suction cup

ISO 8124-1	EN 71-1	ASTM F963
Attach a clamp on the shaft such that the edge of the clamp is at a point (57^{+1}_0) mm or the maximum distance (if less than 57 mm) from the contact surface of the projectile	The distance from the end of the suction cup to the front edge of the clamp shall be (57^{+5}_0) mm or the maximum distance (if less than 57 mm)	Place a clamp on the shaft such that the edge of the clamp is at a point (57 ± 1) mm or the maximum distance (if less than 57 mm) from the tip of the projectile
		

6.4 Material

The clauses specifying requirements related to material properties are outlined in the [Table 30](#).

Table 30 — Clauses related to material properties

ISO 8124-1	EN 71-1	ASTM F963
4.3 Material 4.3.1 Material quality See E.4	4.1 Material cleanliness (See A.3) 5.2 Soft-filled toys and soft-filled parts of a toy (See A.27)	4.1 Material quality 4.3.7 Stuffing materials
4.3.2 Expanding materials See E.5 5.21 Expanding materials	4.6 Expanding materials (See A.7) 8.14 Expanding materials (See 4.6)	4.40 Expanding materials

Table 30 (continued)

ISO 8124-1	EN 71-1	ASTM F963
4.6.1 Accessible sharp edges of glass or metal	4.5 Glass (See 5.7 and A.6) 5.7 Glass and porcelain (See 4.5 and A.6)	4.7.1 Potentially hazardous sharp metal and glass edges are defined in 16 CFR 1500.49

6.4.1 Fillings

For toys intended for children under 36 months, EN 71-1 requires that fillers shall not contain any hard and sharp contaminants such as pieces of metal, nails, needles and splinters. ASTM F963 also requires that loose fillers for stuffed toys shall be free of objectionable matter originating from insect, bird, rodent, or other animal infestation and of contaminants such as splinters, glass and metal chips to the extent possible in good manufacturing practice. ISO 8124-1 requires that all materials shall be visually clean and free from infestation.

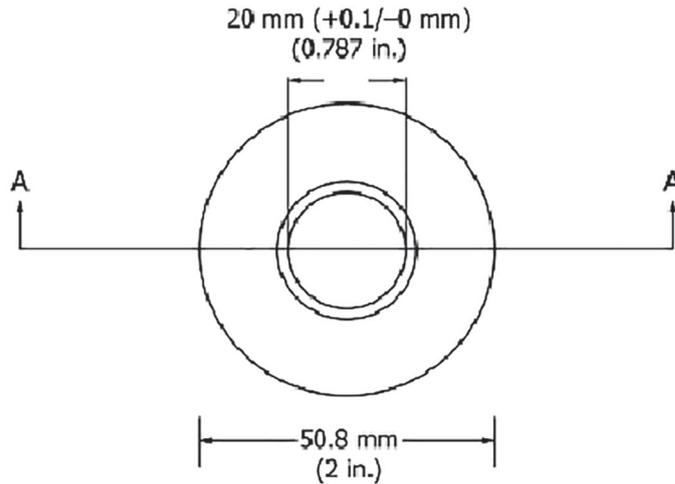
In EN 71-1 and ISO 8124-1, filler shall be assessed visually by the unaided eye rather than under magnification. ASTM F963 requires that a visual inspection shall be performed on a representative sample of the stuffing material using a stereo widefield microscope, or equivalent, at 10× magnification and adequate illumination.

In EN 71-1, soft-filled toys and soft-filled parts of a toy containing small parts (e.g. rattling components, bells, shredded foam) or with filler from which pieces can be bitten or torn thereby producing small parts, shall have at least one covering so that, after tension testing of the seams and materials, it shall not be possible to insert the front part of probe A through any one opening in the seam or cover material. Soft-filled toys and soft-filled parts of a toy containing fibrous filler material shall have at least one covering such that, after tension testing of the seams and materials, it shall not be possible to insert the front part of a 12 mm diameter rod with a fully radiused end through any one opening in the seam or cover material by more than 6 mm. In ISO 8124-1 and ASTM F963 there is no requirement for a cover of the filler(s).

6.4.2 Expanding materials

In EN 71-1 and ISO 8124-1, toys and components of toys which fit entirely in the small parts cylinder shall not expand more than 50 % in any direction after a 24 h, 48 h or 72 h soaking test. In EN 71-1, if the expanding material is enclosed by a material intended to break during soaking, the requirement shall also be met when the test is performed after the removal of the breakable material. There is no corresponding requirement in ISO 8124-1 to remove a breakable enclosing material.

ASTM F963 requires that toys and components of toys which fit entirely in the small parts cylinder and which expand more than 50 % in any direction after conditioning and a 6 h, 24 h, 48 h or 72 h soaking test shall completely pass through the gauge specified in [Figure 1](#) when tested as specified in ASTM F963. If the toy or component exhibits expansion equal to or less than 50 % in all dimensions from its as-received state, at all measurement time intervals, the toy or component is classified as not containing or being composed of an expanding material and no further related testing is required.



MATERIAL: 2 in. (50.8 mm) DIAMETER POLYTETRAFLUOROETHYLENE (PTFE) ROD STOCK

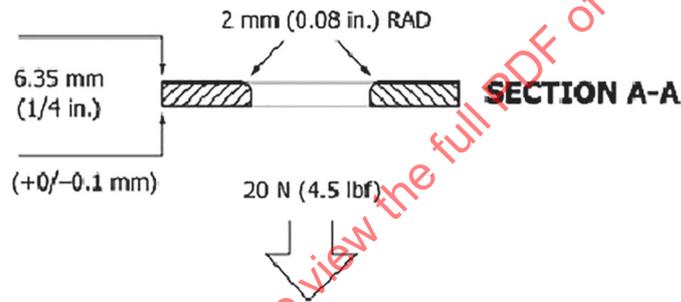


FIG. 30 Expanding Toy Test Template

Figure 1 — Expanding Toy Test Template

6.4.3 Glass and porcelain

EN 71-1 limits the scope of the requirements to accessible glass and porcelain; however, it also states that glass shall not be used in the construction of toys intended for children under 36 months. EN 71-1 permits the use of accessible glass in toys intended for children 36 months and over where:

- a) its use is necessary for the function of the toy;
- b) it does not produce hazardous sharp edges or hazardous sharp points after the drop and impact tests.

ISO 8124-1 and ASTM F963 refer to “accessible edges of glass or metal” as shown in the [Table 31](#).

Table 31 — Sharpness requirements for accessible glass edges

	Under 36 months	36 months and over, but under 96 months	96 months and over, but under 14 years
ISO 8124-1	After normal use tests and reasonably foreseeable abuse tests, accessible edges on toys intended for children under 96 months shall not be hazardous sharp edges of glass		Toy shall not present hazardous sharp edges of glass after normal use tests

Table 31 (continued)

	Under 36 months	36 months and over, but under 96 months	96 months and over, but under 14 years
EN 71-1	Accessible glass and accessible porcelain shall not be used in the construction of toys intended for children under 36 months	Accessible glass may be used in the construction of toys for children of 36 months and over where: <ol style="list-style-type: none"> its use is necessary to the function of the toy it is textile glass used for reinforcement it is in the form of solid glass marbles or solid glass eyes for dolls it is in the form of other glass elements that after being subjected to drop and impact tests do not expose accessible hazardous sharp edges or accessible hazardous sharp points 	
ASTM F963	Toys shall not have accessible, potentially hazardous sharp edges. Toys intended for use by children under 8 years of age are subject to these requirements before or after use and abuse testing, or both		Toy shall not have accessible, potentially hazardous sharp edges after normal use tests

6.5 Small parts

6.5.1 General

The clauses specifying the requirements related to small parts are indicated in [Table 32](#).

Table 32 — Clauses related to small parts

ISO 8124-1	EN 71-1	ASTM F963
4.4 Small parts See E.6 4.4.1 For children under 36 months 5.2 Small parts test	5 Toys intended for children under 36 months 5.1 General requirements (see A.26) 8.2 Small parts cylinder (see 4.6, 4.11, 4.18, 4.23.2, 4.23.3, 4.25, 5.1, 5.2 and A.36) 8.9 Soaking test (see 4.11, 4.23.2, 5.1, 5.10 and 5.12)	4.6 Small objects 4.6.1 Toys that are intended for children under 36 months of age 5.8 Toys intended to be assembled by an adult
4.4.2 For children 36 months and over but under 72 months B.2.3 Toys that are small parts, toys containing small parts and toys with removable small part components 5.2 Small parts test	7.2 Toys not intended for children under 36 months (see 4.22 and A.34)	4.6.3 Toys and games that are intended for use by children who are at least three years old (36 months) but less than six years of age (72 months)

6.5.2 Small parts exemptions

The small part exemptions are similar across the referenced standards, as shown in [Table 33](#). ASTM F963 identifies elastic as exempt. ISO 8124-1 and EN 71-1 indicate that felt and elastic fabric are exempt from the small parts requirements. In ISO 8124-1 and EN 71-1, elastic polymeric materials that are interwoven in an elasticized fabric, as well as elasticized thread sewn in to a fabric, are excluded from the requirements of small parts. However, elastic polymeric materials (e.g. rubber bands) that are not interwoven in, or sewn into, a piece of fabric material are not excluded from the small parts requirements.

ISO 8124-1 and EN 71-1 do not exempt tightly packed stuffed components made of fabric or yarn.

For toys intended for children under 36 months, EN 71-1 specifies that attached paperboard components of toys that detach after a tension test shall not be considered small parts. In ISO 8124-1, toys, components of toys and removable components made entirely of paperboard that do not fit entirely in the small part cylinder are exempt from foreseeable abuse tests.

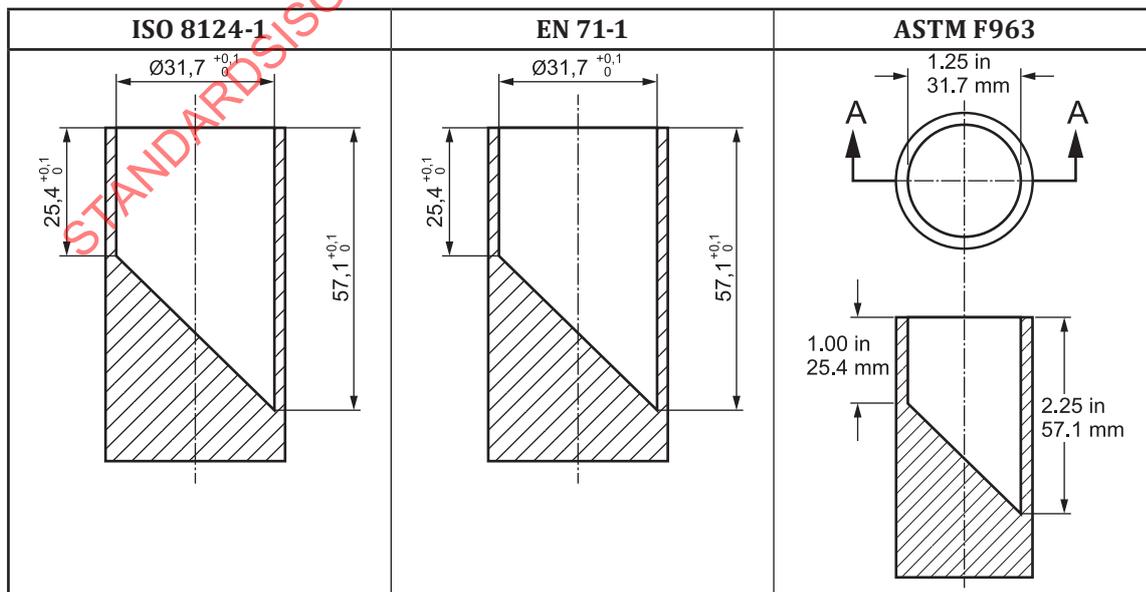
Table 33 — Small parts exemptions

ISO 8124-1	EN 71-1	ASTM F963
Paper books and other articles made of paper and pieces of paper	Paper	Pieces of paper Books and other paper articles
Writing materials such as crayons, chalk, pencils and pens	Crayons, chinks, pencils and similar writing and drawing implements without removable components	Writing materials (crayons, chalk, pencils, and pens)
Modelling clay and similar products	Modelling clay and similar products	Modelling clay and similar products
Fingerpaints, water colours, paint sets and paint brushes	—	Fingerpaints, watercolors, and other paint sets
Fuzz	Fuzz	Fuzz
Fibrous filling material	—	—
Balloons	Balloons	Balloons
Textile fabric, including non-woven fabric such as felt	Fabric (including felt and elastic fabric)	Fabric
Yarn	Yarn	Yarn
Elastic fabric	Elastic fabric	Elastic
String	String	String
Audio and/or video discs which are not themselves small parts	—	Phonograph records and compact discs (CDs)

6.5.3 Test methods

The gauges and tests for small parts are essentially aligned across the referenced standards (see [Table 34](#)). There are minor dimensional differences for the gauge in ASTM F963 due to a lack of tolerances in the specification.

Table 34 — Small parts cylinders



6.6 Shape, size and strength of certain toys

6.6.1 General

The clauses for shape, size and strength of certain toys in the referenced standards are indicated in [Table 35](#).

Table 35 — Clauses relating to the shape, size and strength of certain toys

ISO 8124-1	EN 71-1	ASTM F963
4.5 Shape, size and strength of certain toys See E.7 4.5.1 Squeeze toys, rattles, fasteners, and certain other toys and components of toys 4.5.1.1 General 4.5.1.2 Squeeze toys, rattles, and certain other toys and components of toys 4.5.1.3 Other toys or components of toys with nearly spherical, hemispherical, circular flared, or dome-shaped ends of toys having a mass less than 0,5 kg and intended for children under 18 months See E.7 5.3 Test for shape and size of certain toys	5.8 Shape and size of certain toys (see A.31) 8.16 Geometric shape of certain toys (see 5.8, 5.11 and A.43)	4.22 Teethers and teething toys 4.23 Rattles 4.24 Squeeze toys 4.32 Certain toys with nearly spherical ends 4.32.1 Nearly spherical, hemispherical, circular flared, or dome-shaped ends of toys or components of toys
4.5.1.4 Toy fasteners (e.g. nails, bolts, screws, and pegs) with nearly spherical, hemispherical, or dome-shaped ends intended for children 18 months and over but under 48 months	—	4.32.2 Nearly spherical, hemispherical, or dome-shaped ends of toy fasteners (for example, nails, bolts, screws, pegs)
4.5.2 Small balls 5.4 Small balls test B.2.5 Small balls and marbles	4.22 Small balls (see 5.10 and A.48) 5.10 Small balls (see also 4.22 and A.48) 8.32 Small balls and suction cups test (see 4.17, 4.22, 4.25, 5.10 and 5.13) 8.32.1 Small balls and suction cups test (see Clause 6) 8.32.2 Small balls attached to a toy by a cord 7.2 Toys not intended for children under 36 months (see 4.22 and A.34)	4.34 Balls 4.34.1 Balls intended for children under 36 months of age 4.34.2 Toys intended for children at least 3 years old but less than 8 years of age that contain a loose small ball 5.11.3 For any small ball intended for children 3 years of age or older
4.5.3 Pompoms 5.5 Test for pompoms 5.24.6.3 Tension test for pompoms	—	4.35 Pompoms 8.16 Pompoms are subjected to the torque test as described in 8.8 and 8.8.1 and the tension test as described herein

Table 35 (continued)

ISO 8124-1	EN 71-1	ASTM F963
4.5.4 Pre-school play figures 5.6 Test for pre-school play figures	5.11 Play figures 8.33 Test for play figures (see 5.11)	4.32.3 Preschool play figures
4.5.5 Toy pacifiers	—	4.20.2 Toy pacifiers attached to, or sold with, toys intended for children under 36 months of age
4.5.6 Balloons B.2.4 Balloons	4.12 Balloons (see 4.3 and A.16) 7.3 Latex balloons (see 4.12 and A.16)	4.31 Balloons – Packages containing latex balloons and toys or games containing latex balloons 5.11.5 For any latex balloon or any toy or game that contains a latex balloon
4.5.7 Marbles B.2.5 Small balls and marbles	Marble is covered by the definition of “balls” in EN 71-1	4.33 Marbles 5.11.4 For any marble intended for children 3 years of age or older
4.5.8 Hemispheric-shaped toys See E.41	5.12 Hemispheric-shaped toys (see A.50)	4.36 Hemispheric-shaped objects
—	5.13 Suction cups (see A.54)	—

6.6.2 Squeeze toys, rattles and certain other toys

See [Table 36](#).

- a) EN 71-1 has a broader scope than ISO 8124-1 and ASTM F963 in terms of product categories. EN 71-1:2014+A1:2018, 5.8, generally applies to toys for children who are unable to sit up unaided, while ISO 8124-1 applies to specific toy categories. ASTM F963 applies to rattles, squeeze toys, teethers and teething rings only.
- b) In EN 71-1, the requirement for shape and size of certain toys does not apply to rigid elements having a major dimension of 30 mm or less. In ASTM F963, rigid components having a major dimension of 1,2 in. (30 mm) or less contained within soft-filled toys are exempt from the size and shape requirement for teethers and teething toys, rattles and squeeze toys. There is no corresponding exemption in ISO 8124-1.
- c) The shape and size requirements in EN 71-1 apply to toys intended for children who are unable to sit up unaided where the toy or toy part weighs less than 0,5 kg. The scope of ISO 8124-1 is broader in terms of the age range (under 18 months) for squeeze toys, teethers and teething toys, but it aligns with EN 71-1 for the removable components of toys intended to be strung across a crib, playpen or perambulator and for the removable components of baby gyms (under 6 months), and rattles (children who are unable to sit up unaided).

Table 36 — Squeeze toys, rattles and certain other toys

ISO 8124-1	EN 71-1	ASTM F963
4.5.1 Squeeze toys, rattles, fasteners, and certain other toys and components of toys Exemption: Soft-filled (stuffed) toys or soft-filled parts of toys or parts made entirely of fabric	5.8 Shape and size of certain toys Exemption: Soft-filled parts of a toy or parts of fabric Rigid elements having a major dimension equal to 30 mm or less	4.22 Teethers and teething toys Exemption: (1) Teething toys that are composed of liquid-filled beads that are attached to form a ring or beads that are threaded on a flexible cord or string (2) Soft-filled (stuffed) teething toys or soft-filled parts or parts of fabric (3) Rigid components having a major dimension equal to or less than 1,2 in. (30 mm) contained within soft-filled teething toys
Scope	Scope	
Squeeze toys intended for children under 18 months Rattles	Rattle-shaped toys and squeeze toys with or without noise making features	
Teethers and teething toys intended for children under 18 months;	Teethers, toys or components intended to be chewed on	
Legs of baby gyms intended for children under 18 months	Legs of baby gyms	4.23 Rattles Exemption: (1) Soft-filled (stuffed) rattles or soft-filled parts or parts of fabric (2) Rigid components having a major dimension equal to or less than 1,2 in. (30 mm) contained within soft-filled rattles
Removable components of toys intended to be strung across a crib, playpen or perambulator (if they have a mass less than 0,5 kg and are intended for children under 6 months)	Removable components of toys intended to be strung across a crib, playpen or perambulator	
Removable components of baby gyms (if they have a mass less than 0,5 kg and are intended for children under 6 months)	Removable components of baby gyms	4.24 Squeeze toys Exemption: (1) Soft-filled (stuffed) squeeze toys or soft-filled parts or parts of fabric (2) Rigid components having a major dimension equal to or less than 1,2 in. (30 mm) contained within soft-filled squeeze toys
—	Hand-held activity toys	
—	Books and building blocks covered by textile or vinyl	

d) ISO 8124-1 and ASTM F963 have a requirement for toy fasteners with nearly spherical, hemispherical or domed-shaped ends which are intended for children over 18 months but less than 48 months. EN 71-1 does not set requirements for toy fasteners.

6.6.3 Small balls

- a) All three standards prohibit small balls in toys intended for children under 36 months. EN 71-1 does not apply to soft-filled balls. In all three standards, a small ball is any ball that passes entirely through the template when tested in accordance with the small ball test. Only EN 71-1 includes balls attached to a toy by a cord.
- b) The differences between warning statements for small balls are shown in [Table 37](#).

Table 37 — Differences in warnings for small balls

	Age grade	Warning
ISO 8124-1	Toys intended for children 36 months and over, but under 96 months	“Warning! Not suitable for children under 3 years. Small ball(s). Choking hazard.”
NOTE EN 71-1 includes the following: 'The provisions in 7.2 do not apply to toys which, on account of their function, dimensions, characteristics, properties or other cogent grounds, are clearly unsuitable for children under 36 months.'		

Table 37 (continued)

	Age grade	Warning
EN 71-1	Toys not intended for children under 36 months	“Warning. Not suitable for children under 36 months. Small balls” (see Note)
ASTM F963	For any small ball intended for children 3 years of age or older	⚠ WARNING: CHOKING HAZARD—This toy is a small ball. Not for children under 3yrs.
	For any toy or game intended for children who are at least 3 years old but less than 8 years of age that contains a small ball	⚠ WARNING: CHOKING HAZARD—Toy contains a small ball. Not for children under 3yrs.
NOTE EN 71-1 includes the following: ‘The provisions in 7.2 do not apply to toys which, on account of their function, dimensions, characteristics, properties or other cogent grounds, are clearly unsuitable for children under 36 months.’		

6.6.4 Pompoms

ASTM F963 and ISO 8124-1 apply different tension forces for a pompom connected to a toy: 70 N ± 2 N for ISO 8124-1 and 67 N for ASTM F963. EN 71-1 does not contain a corresponding requirement for pompoms.

6.6.5 Toy pacifiers

In ASTM F963, toy pacifiers attached to or sold with toys intended for children under 36 months of age shall either conform to the requirements of 16 CFR 1511 or have a nipple length no longer than 0,63 in. (16 mm). ISO 8124-1 only specifies that toy pacifiers attached to or sold with toys intended for children under 36 months shall have a nipple length no longer than 16 mm. EN 71-1 does not include specific requirements for toy pacifiers.

NOTE Toy pacifiers with toys intended for children under 36 months of age are subject to the small parts requirements in the three referenced standards.

6.6.6 Balloons

All three referenced standards set suffocation hazard warning requirements for latex balloon packaging. Further, if a balloon is made of natural rubber latex, EN 71-1 requires the package to display the statement “Made of natural rubber latex”. In EN 71-1, there is an explicit statement indicating that if there is no packaging, the information shall be on the balloons and/or on a leaflet accompanying the balloons. There is no such statement in the ISO 8124-1 and ASTM F963.

6.6.7 Marbles

The differences between warning statements for marbles are shown in [Table 38](#).

Table 38 — Differences in warnings for marbles

	Age grade	Warning
ISO 8124-1	Toys intended for children 36 months and over, but under 96 months	“Warning! Not suitable for children under 3 years. Marble(s). Choking hazard.”
EN 71-1	Toys not intended for children under 36 months	“Warning. Not suitable for children under 36 months. Small balls.” (see Note)
NOTE EN 71-1 includes the following: ‘The provisions in 7.2 do not apply to toys which, on account of their function, dimensions, characteristics, properties or other cogent grounds, are clearly unsuitable for children under 36 months.’		

Table 38 (continued)

	Age grade	Warning
ASTM F963	For any marble intended for children 3 years of age or older	⚠ WARNING: CHOKING HAZARD—This toy is a marble. Not for children under 3yrs.
	For any toy or game intended for children who are at least 3 years of age but less than 8 years of age that contains a marble	⚠ WARNING: CHOKING HAZARD—Toy contains a marble. Not for children under 3yrs.
NOTE EN 71-1 includes the following: 'The provisions in 7.2 do not apply to toys which, on account of their function, dimensions, characteristics, properties or other cogent grounds, are clearly unsuitable for children under 36 months.'		

6.6.8 Hemispheric-shaped toys

Hemispheric-shaped toys for holding liquids which are intended for children 2 years and older are exempted in ISO 8124-1 and ASTM F963, but they are not exempt in EN 71-1. ASTM F963 also has an exemption for objects intended for drinking. See [Table 39](#).

EN 71-1 applies the requirements to hemispheric-shaped containers that are packaging elements of toys for children under 36 months; these containers are exempted in ASTM F963 and ISO 8124-1 only where they are intended to be discarded after the toy is removed from the package. See [Table 40](#).

Table 39 — Exemptions from hemispheric-shaped toy requirements

ISO 8124-1	EN 71-1	ASTM F963
Hemispheric-shaped toys	Hemispheric-shaped toys	Hemispheric-shaped objects
—	—	Objects intended for drinking (for example, tea cup)
Objects intended to hold liquids in products appropriate for children of 24 months and over (e.g. pots and pans)	—	Objects intended to hold liquids in products appropriate for children at least 2 years old (for example, pots and pans)
Containers which must be airtight so that the contents can maintain their functional integrity (e.g. modelling clay containers)	Containers that need to be airtight so the contents can maintain their functional integrity (e.g. modelling clay containers)	Containers that shall be airtight so the contents can maintain their functional integrity (for example, modelling clay containers.)
Components of larger products which do not become detached when tested in accordance with 5.24 (e.g. a bowl-shaped smoke stack which is permanently attached to a toy train, or a swimming pool which is moulded into a larger toy playscape)	Components of larger products (e.g. bowl-shaped smoke stack that is permanently attached to a toy train or a swimming pool that is moulded into a larger toy playscape) that do not become detached when tested according to 8.3 (torque test), 8.4.2.1 (tension test, general), 8.5 (drop test), 8.7 (impact test) and 8.8 (compression test) and for glued wooden toys 8.9 (soaking test). For large and bulky toys, the drop test is substituted by 8.6 (tip over test)	Non-detachable (as determined by testing in accordance with 8.6 to 8.10 of this specification) components of larger products (for example, bowl-shaped smoke stack that is permanently attached to a toy train or a swimming pool that is moulded into a larger toy playscape)

Table 39 (continued)

ISO 8124-1	EN 71-1	ASTM F963
Containers that are part of packaging intended to be discarded once the toy is removed from the packaging	<p>—</p> <p>NOTE See also the requirement in 6 e) regarding packaging which is hemispheric-shaped</p> <p>6 e) The requirements in 5.12 (hemispheric shaped toys) apply to hemispheric-shaped containers that are part of the packaging for toys intended for children under three</p>	Containers that are part of the retail package intended to be discarded once the toy is removed from the package

Table 40 — Hemispheric-shaped toy requirements

ISO 8124-1	EN 71-1	ASTM F963
Requirements for hemispheric-shaped toys	Requirements for hemispheric-shaped toys	Requirements for hemispheric-shaped objects
4.5.8 a-d	5.12 a-d	4.36.6 a-d
—	—	(e) Have an opening with a minor dimension of at least 0,66 in. (17 mm) located anywhere in the base or in the side wall of the object. If the opening is located in the sidewall of the object, the edge of the opening shall be at least 0,5 in. (13 mm) from the rim as measured along the outside contour

6.6.9 Suction cups

EN 71-1 sets a size requirement (template E) for loose, separable or detachable suction cups on toys intended for children under 36 months. ISO 8124-1 and ASTM F963 do not have a similar requirement.

6.6.10 Test templates

The test template dimensions are the same in EN 71-1 and ISO 8124-1, but there are minor dimensional differences for the templates in ASTM F963 due to a lack of tolerances in the specifications. See Table 41.

Table 41 — Test templates

	ISO 8124-1	EN 71-1	ASTM F963
Template A (Rattle Test Fixture in ASTM F963)		<p>Dimensions in millimetres</p>	

Table 41 (continued)

	ISO 8124-1	EN 71-1	ASTM F963
Template B (Supplemental Test Fixture for Rattles, Squeeze Toys, and Teethers in ASTM F963)		Dimensions in millimetres 	
Template C (Template E for EN 71-1) (Test Fixture for Small Balls in ASTM F963)			

6.7 Edges

6.7.1 General

The clauses for sharp edge requirements are indicated in [Table 42](#).

Table 42 — Clauses related to sharp edges

ISO 8124-1	EN 71-1	ASTM F963
4.6 Edge See E.11 4.6.1 Accessible sharp edges of glass or metal 5.8 Sharp-edge test	4.7 Edges (see A.8) 4.7 a) (metal and glass edges only) 4.7 b) 5.1 b) 8.11 Sharpness of edges	4.7.1 Potentially hazardous sharp metal and glass edges 5.8 Toys Intended to be assembled by an adult
4.6.2 Functional sharp edges B.2.12 Toys with functional sharp edges and functional sharp points	4.7 d) 7.6 Hazardous sharp functional edges and points (see 4.7 and 4.8)	4.7.2 Toys containing potentially hazardous edges that are a necessary part of the function of a toy 5.10 Toys with functional sharp edges or points
4.6.3 Edges on metal toys	4.7 a), b), c)	4.7.3 Metal toys
4.6.4 Edges on moulded toys	4.7 c)	4.7.4 Moulded toys

Table 42 (continued)

ISO 8124-1	EN 71-1	ASTM F963
4.6.5 Edges on exposed bolts or threaded rods	Covered by general sharp edge requirement in EN 71-1	4.7.5 Exposed bolts or threaded rods

6.7.2 Age range for application of the functional sharp edge exemption

A hazardous sharp functional edge, accompanied by a warning on the packaging, is allowed beginning at 36 months and over in ISO 8124-1 and EN 71-1, and at 48 months and over in ASTM F963. EN 71-1 does not apply an upper age limit for the functional sharp edge warning requirement, whereas ISO 8124-1 and ASTM F963 apply an upper age limit of 96 months.

6.7.3 Toys assembled by adults

ASTM F963 requires that toys intended to be assembled by an adult, which in their unassembled state contain potentially hazardous sharp edges or points, shall have safety labelling.

NOTE ISO 8124-1:2018, B.3.6) includes an informative note on the interpretation of these requirements, which is similar to what is required in ASTM F963.

6.7.4 Test method

The test method for sharp edges in ASTM F963 references 16 CFR 1500.49. The ends of tape can overlap by not more than 0,1 in. Other differences in the methods are shown in Table 43.

Table 43 — Sharp edge test parameters

Parameter	ISO 8124-1	EN 71-1	ASTM F963
The diameter of mandrel	(9,53 ± 0,12) mm	(9,53 ± 0,12) mm	(0,375 ± 0,005) in. [(9,53 ± 0,12) mm] NOTE Diameter is derived from 16 CFR1500.49. In 16 CFR1500.49, the diameter is 9,35 mm which is an error in the conversion from inches to mm (0,375 inches convert to 9,53 mm)
The surface roughness value	Ra ≤ 0,40 μm	Ra ≤ 0,40 μm	Ra ≤ 0,40 μm
The surface hardness	Rockwell hardness value ≥40 HRC	Rockwell C not less than 40	Rockwell C not less than 40
The mandrel rotating tangential velocity	(23 ± 4) mm/s	(23 ± 4) mm/s	(1,00 ± 0,08) in./s [(25,4 ± 2,0) mm/s]
Force applied to the mandrel	(6 ^{0,0} _{-0,5}) N	(6 ± 0,5) N	1,35 lb (6,00 N)
Test method	Calculate the percentage length of the tape which has been cut during the test. If this is more than 50 % of the contact length, the edge is a potentially hazardous sharp edge NOTE Corresponds to 14,97 mm with a mandrel of 9,53 mm diameter	Same as ISO 8124-1	If the length of the tape which has been cut during the test is more than ½ inch, the edge is a potentially hazardous sharp edge NOTE Corresponds to 12,7 mm with a mandrel of 9,53 mm diameter (0,375 in.)

Table 43 (continued)

Parameter	ISO 8124-1	EN 71-1	ASTM F963
Force application point	3 mm from the leading edge of the tape	The mandrel at the centre of the tape	The edge contacts the approximate centre of the width of the tape
Support position	Ensure that the support is not less than 15 mm from the edge to be tested	Ensure that the support is 15 mm or more from the edge to be tested	The sharp edge test shall be performed with the edge supported so that its stiffness approximates but is not greater than the edge stiffness in the assembled sample
Test tape	Pressure-sensitive polytetrafluoroethylene (PTFE) tape, of thickness between 0,066 mm and 0,090 mm, of width ≥ 6 mm, and with adhesive made of pressure-sensitive silicone polymer with a nominal thickness of 0,08 mm	The self-adhesive tape shall be pressure-sensitive polytetrafluoroethylene (PTFE) high temperature electrical insulation tape The thickness of the polytetrafluoroethylene backing shall be between 0,066 mm and 0,090 mm. The adhesive shall be pressure-sensitive silicone polymer with a nominal thickness of 0,08 mm The width of the tape shall be 6 mm or more	The tape shall be pressure-sensitive polytetrafluoroethylene (TFE) high temperature electrical insulation tape The thickness of the polytetrafluoroethylene backing shall be between 0,002 6 inch (0,066 mm) and 0,003 5 inch (0,089 mm). The adhesive shall be pressure-sensitive silicone polymer with a nominal thickness of 0,003 inch (0,08 mm) The width of the tape shall not be less than 1/4 inch (6 millimetres)
Maintained temperature	—	During the tests, the temperature of the tape shall be maintained at $(20 \pm 5) ^\circ\text{C}$	While conducting sharp edge tests the temperature of the tape shall be maintained between $70 ^\circ\text{F}$ ($21.1 ^\circ\text{C}$) and $80 ^\circ\text{F}$ ($26,6 ^\circ\text{C}$)

6.8 Points

6.8.1 General

The clauses for the sharp points requirements are indicated in [Table 44](#).

Table 44 — Clauses related to sharp points

ISO 8124-1	EN 71-1	ASTM F963
4.7 Points See E.12 4.7.1 Accessible sharp points 5.9 Sharp-point test	4.8 Points and metallic wires 4.8 a) 5.1 b) 5.1 c) 8.12 Sharpness of points (see 4.5, 4.8, 4.9, 4.10.2, 4.14.2, 4.15.1.3, 5.1 and A.40)	4.9 Accessible points 4.9.1 Potentially hazardous sharp points 5.8 Toys Intended to be assembled by an adult
4.7.2 Functional sharp points	4.8 b) 7.6 Hazardous sharp functional edges and points (see 4.7 and 4.8)	4.9.2 Toys in which an accessible, potentially hazardous sharp point is a necessary function of the toy 5.10 Toys with functional sharp edges or points
4.7.3 Wooden toys	4.8 e)	4.9.3 Wood

6.8.2 Age range for application of the functional sharp point exemption

A hazardous sharp functional point, accompanied by a warning on the packaging, is allowed beginning at 36 months and over in ISO 8124-1 and EN 71-1, and at 48 months and over in ASTM F963. EN 71-1 does not apply an upper age limit for the functional sharp point warning requirement, whereas ISO 8124-1 and ASTM F963 apply an upper age limit of 96 months.

6.8.3 Electrical conductors

EN 71-1 specifies an additional exemption for electrical conductors that have sharp points.

6.8.4 Examples of accessible, potentially hazardous sharp points

ASTM F963 provides examples of accessible, potentially hazardous sharp points that may occur because of the following:

- a) configuration of the toy;
- b) assembly devices such as wires, pins, nails, and staples that are fastened poorly;
- c) poorly sheared sheet metal;
- d) burrs on screws;
- e) splintered wood.

EN 71-1 also mentions "splinters" in the requirement for metallic wires.

6.8.5 Test method

Differences in parameters are shown in [Table 45](#).

Table 45 — Sharp points test parameters

Parameter	ISO 8124-1	EN 71-1	ASTM F963
Rectangular opening	(1,02 ± 0,02) mm wide by (1,15 ± 0,02) mm long	(1,02 ± 0,02) mm by (1,15 ± 0,02) mm	0,040 in. (1,02 mm) wide by 0,045 in. (1,15 mm) long
Sensing head recessed	(0,38 ± 0,02) mm	(0,38 ± 0,02) mm	0,015 in. (0,38 mm)
Force of a return spring	$(2,5^{0}_{-0,3})$ N	$(2,5^{0}_{-0,3})$ N	0,5 lb (2,2 N)
Force of application	$(4,5^{0}_{-0,2})$ N	4,5 N	1,0 lb (4,45 N)
Support position	Support at not less than 6 mm from the point to be tested	Ensure that the support is 6 mm or more from the point to be tested	The sharp point test shall be performed with the point supported so that its stiffness approximates but is not greater than the point stiffness in the assembled sample
Gap	(0,12 ± 0,02) mm	(0,12 ± 0,02) mm	0,005 in. (0,12 mm)

6.9 Projections

6.9.1 General

The clauses for the requirements for projections are indicated in [Table 46](#).

Table 46 — Clauses related to requirements for projections

ISO 8124-1	EN 71-1	ASTM F963
4.8 Projections See E.13 4.8.1 General requirements 5.24 Reasonably foreseeable abuse tests	4.9 Protruding parts (see A.10) 8.4.2.3 Protective components (see 4.9 and 4.17.1)	4.8 Projections 8.5 Normal use testing 8.6 Abuse testing 8.7 Impact tests 8.8 Torque tests for removal of components 8.9.1 Tension test for seams in stuffed toys and beanbag type toys 8.10 Compression test
4.8.2 Special considerations for bath toy projections	—	4.8.1 Bath toy projections

6.9.2 Ends of rigid handlebars

ISO 8124-1 and EN 71-1 define requirements for the ends of rigid handlebars. ASTM F963 includes no specific similar requirements, but the related requirements are addressed in other US standards (e.g. ASTM F2264).

6.9.3 Age grade

ASTM F963 requires the assessment of potential hazards of toy protrusions only for toys for children under 8 years of age. EN 71-1 and ISO 8124-1 assess for protrusions regardless of the toy's age grade.

6.9.4 Bath toy projections

ISO 8124-1 and ASTM F963 list additional design guidelines for bath toy projections. EN 71-1 does not provide similar design guidelines.

6.9.5 Protective components

Differences are shown in [Table 47](#).

Table 47 — Abuse tests for protective components

	ISO 8124-1	EN 71-1	ASTM F963
Toys intended for children under 8 years	Protective component shall not be detached before and after abuse tests in ISO 8124-1, 5.24	Protective component shall not be detached before and after tension test for protective components	Protective component shall not be detached before and after abuse tests in ASTM F963, 8.5 to 8.10
Toys intended for children 8 years and over			Tension test not required

NOTE There is a need for clarification in ISO 8124-1 for cases where the test is applied to toys intended for children over 96 months.

6.10 Metal wires and rods

6.10.1 General

The clauses for the requirements for metal wires or rods are indicated in the [Table 48](#).

Table 48 — Clauses related to metal wires or rods

ISO 8124-1	EN 71-1	ASTM F963
4.9 Metal wires and rods See E.14 4.9 a) 5.24.8 Flexure test	4.8 c) 8.13 Flexibility of metallic wires (see 4.8 and A.41)	4.10 Wires or rods 8.12 Flexure test
4.9 b) 5.24.8 Flexure test	4.8 d)	
4.9 c)	4.9 Protruding parts (see A.10) 8.4.2.3 Protective components (see 4.9 and 4.17.1)	

6.10.2 Scope of the metal wires and rods flexure test

To determine whether the flexure test is applicable to a metal wire or rod, ISO 8124-1 and EN 71-1 use the same criteria. A maximum force of 70 N is applied perpendicular to the point that is 50 mm away from the main body of the toy or to the end of the metal wire if it is less than 50 mm.

In ASTM F963, the maximum force is applied perpendicularly to the major axis of the component at a point $2 \pm 0,05$ in. ($50 \pm 1,3$ mm) from the intersection of the component with the main body of the toy, or at the end of the component if the component is less than 2 in. (50 mm) long. The applied force shall be as follows [within a tolerance $\pm 0,5$ lb ($\pm 0,02$ kg)]:

- 10 lbf (45 N) for toys intended for use by children 18 months of age or less;
- 15 lbf (67 N) for toys intended for use by children over 18 months but under 96 months of age.

6.10.3 Metal wire flexure test methods

In ASTM F963, the flexure test is only applied to metal wires that are used in toys for stiffening or retention of form.

EN 71-1 and ISO 8124-1 define two different methods:

- 1) metal wires designed to be bent: 30 cycles flexure test;
- 2) metal wires not designed to be bent, but which are likely to be bent: 1 cycle flexure test.

ASTM F963 does not distinguish between wire designed to be bent and wire which is not designed but is likely to be bent.

See [Table 49](#) for an abbreviated comparison of the metal wire flexure test methods.

Table 49 — Metal wire flexure test method comparison

	ISO 8124-1	EN 71-1	ASTM F963
Diameter of metal cylinders, radiused pliers or equivalent metal pieces	(10 ± 1) mm	(10 ± 1) mm	—
Vise shields	No vise shields	No vise shields	Vise shields are fabricated from 13-gauge thick cold-rolled steel or other similar material and have a 0,375 in. (9,5 mm) inside radius
Applied load	(70 ± 2) N	(70 ± 2) N	10 ± 0,5 lbf (45 N) for toys intended for use by children 18 months of age or less 15 ± 0,5 lbf (67 N) for toys intended for use by children over 18 but under 96 months of age.

Table 49 (continued)

	ISO 8124-1	EN 71-1	ASTM F963
	No figure	No figure	

6.11 Plastic film or plastic bags in packaging and in toys

6.11.1 General

The clauses for the requirements for plastic film are indicated in [Table 50](#).

Table 50 — Clauses related to plastic film requirements

ISO 8124-1	EN 71-1	ASTM F963
4.10 Plastic film or plastic bags in packaging and in toys	4.3 Flexible plastic sheeting (see A.5 and A.16) 5.3 Plastic sheeting (see A.28) 6 Packaging (see A.56)	4.12 Plastic film
5.10 Determination of thickness of plastic film and sheeting	8.25 Plastic sheeting 8.25.1 Thickness (see 4.3, 5.3 and Clause 6) 8.25.2 Adhesion (see 5.3)	8.22 Plastic film thickness

6.11.2 Scope of plastic film or plastic bags in packaging and in toys

All standards state the exemption for shrink-wrap. ISO 8124-1 and EN 71-1 are applicable to flexible plastic film or flexible plastic bags without backing. In ASTM F963, the plastic film requirement is applied to flexible plastic film bags and flexible plastic sheets used as packaging materials for shelf packages or used with or as part of toys. ASTM F963 has no exemption for the flexible plastic film or flexible plastic bags with backing.

6.11.3 Minimum sheet thickness

See [Table 51](#).

Table 51 — Requirements of sheet thickness

	ISO 8124-1	EN 71-1	ASTM F963
Average thickness	≥0,038 mm	≥0,038 mm	≥0,001 50 in. (0,038 10 mm)
Minimum sheet thickness	0,032 mm	—	0,001 25 in. (0,031 75 mm)

6.11.4 Thickness of plastic balloons

There is a thickness testing method for plastic balloons in ISO 8124-1 and EN 71-1. For plastic balloons, the thickness requirement applies to double layers of plastic sheeting (i.e. the thickness is measured without inflating or destroying the balloon). ASTM F963 does not contain a specific testing method for plastic balloons.

NOTE ASTM F963 also has thickness requirement for plastic balloons; however, the thickness requirement applies to a single layer of plastic sheeting.

6.11.5 Detached plastic sheeting

EN 71-1 is limited to any plastic sheeting that detaches from the toy and has an area greater than 100 mm × 100 mm. The sheeting shall have an average thickness of not less than 0,038 mm. There is no plastic sheeting adhesion test method in ISO 8124-1 and ASTM F963.

6.11.6 Perforated plastic film

Perforated plastic film is an option for all three standards. ISO 8124-1 further provides detailed requirements and an illustrative example of a perforation pattern.

6.11.7 Determination of plastic sheet area

All three standards specify that bag sides shall be cut for testing, without stretching, into two single sheets. However, for bags with a minor dimension of 3,94 in. (100 mm) or less, ASTM F963 specifies that a bag is not to be cut open to a single sheet to assess its area too. This limit is also specified in EN 71-1, but only applies to bags used in packaging and made of flexible plastics of an area equal to, or less than, 100 mm × 100 mm. There is no similar testing limit in ISO 8124-1.

A comparison of the dial-type thickness gauges specified for film measurement is provided in [Table 52](#).

Table 52 — Plastic film thickness measurement gauge comparison

	ISO 8124-1	EN 71-1	ASTM F963
Accuracy	4 μm	1 μm	4 μm
Diameter of measuring surface	(6 ± 1) mm	(1) Plane/plane measuring surfaces: 2,5 mm ~ 10 mm (2) Plane/radiused measuring surfaces: lower surface: ≥5 mm, radius of curvature of the upper surface: 15 mm ~ 50 mm NOTE According to ISO 4593	—
Compression force	(0,75 ± 0,25) N	(1) Plane/plane measuring surfaces: 0,5 N ~ 1,0 N (2) Plane/radiused measuring surfaces: 0,1 N ~ 0,5 N	—
Parallelism of measuring surface	Parallel to within 5 μm	Parallel to within 5 μm	—

6.12 Cords

6.12.1 General

The clauses for cords are indicated in [Table 53](#).

Table 53 — Clauses related to cord requirements

ISO 8124-1	EN 71-1	ASTM F963
4.11.1 General	5.4.1 General	4.14.6 Ride-on Toys (exemption)
4.11.2 Cords in toys intended for children under 18 months 4.11.2.1 Cords with the potential to tangle 4.11.2.2 Other cords	5.4.2 Cords and chains in toys intended for children under 18 months 5.4.2.1 Cords and chains with the potential to tangle 5.4.2.2 Two cords or chain with the potential to tangle 5.4.2.3 Separated cords and chains 5.4.2.4 Free length of cords and chains	
4.11.3 Cords in toys intended for children 18 months and over but under 36 months 4.11.3.1 Cords with the potential to tangle 4.11.3.2 Other cords 4.11.3.3 Other cords without a free end	5.4.3 Cords and chains in toys intended for children 18 months or over but under 36 months 5.4.3.1 Cords and chains with the potential to tangle 5.4.3.2 Two cords or chains with the potential to tangle 5.4.3.3 Separated cords and chains 5.4.3.4 Free length of cords and chains 5.4.3.5 Cords and chains not suitable for children under 18 months	4.14.1 Cords, Straps, and Elastics in Toys 4.14.1.1 Cords, Straps, and Elastics Containing a Breakaway Feature
4.11.4 Fixed loops and nooses intended for children under 36 months	5.4.4 Fixed loops, tangled loops and nooses	
4.11.5 Cords on pull toys	5.4.5 Cords and chains on pull along toys	4.14.3 Pull toys
4.11.6 Electrical Cables	5.4.6 Electrical cables	—
4.11.7 Diameter of certain cords intended for children under 36 months	5.4.7 Cross-sectional dimension of certain cords	—
4.11.8 Self-retracting cords intended for children under 36 months	5.4.8 Self-retracting cords	4.14.2 Self retracting pull cords
4.11.9 Toys attached to or intended to be strung across, or otherwise attached to, a cradle, cot, perambulator or carriage 4.11.9.1 Toys intended to be strung across a cradle, cot, perambulator or carriage 4.11.9.2 Toys otherwise intended to be attached to a cradle, cot, perambulator or carriage	5.4.9 Toys attached to or intended to be strung across a cradle, cot or perambulator 5.4.9.1 Toys intended to be strung across a cradle, cot or perambulator 5.4.9.2 Toys otherwise intended to be attached to a cradle, cot or perambulator	4.26 Toys Intended to be attached to a crib or playpen 4.26.1 Protrusions 4.26.2 Crib mobiles 4.26.3 Crib gyms 4.28 Stroller and Carriage Toys
4.11.10 Cords on toy bags	4.4 Toy bags 6 b) Packaging	4.14.5 Cords on toy bags intended for children up to 18 months
4.11.11 Cords, strings and lines for flying toys	4.13 Cords of toy kites and other flying toys	4.14.4 Strings and lines for flying devices
—	4.26 Toy Disguise Costumes	—
5.11.1 Cord cross-sectional dimension	8.20 Cords cross-sectional dimension See 5.4.7)	—

Table 53 (continued)

ISO 8124-1	EN 71-1	ASTM F963
5.11.2 Length of cords and electrical cables		—
5.11.2.1 Free lengths of cords and electrical cables	8.40 Length of cords, chains and electrical cables (see 5.4.2, 5.4.3, 5.4.5 and 5.4.6)	
5.11.2.2 Tangled loops of length of cords		
5.11.3 Breakaway feature separation test	8.38 Breakaway feature separation test (see 5.4.2, 5.4.3 and 5.14)	—
5.11.4 Test for fixed loops and nooses	8.36 Perimeter of cords and chains (see 5.4.4)	8.23 Test for loops and cords
5.11.5 Self-retracting cords	8.39 Self-retracting cords (see 5.4.8)	—
5.11.6 Electrical resistance of cords	8.19 Electric resistivity of cords (see 4.13)	
—	8.41 Assessment of the tangle potential of two cords or chains	—
B.2.10 Toys intended to be strung across a cradle, cot, perambulator or carriage	7.11 Toys otherwise intended to be strung across a cradle, cot, or perambulator (see 5.4.9.1)	5.5 Crib and Playpen Toys 5.7 Stroller and Carriage Toys 6.2 Crib and Playpen Toys
B.2.16 Toy kites	7.9 Toy kites (see 4.13)	—
B.2.22 Toys with electrical cables exceeding 300 mm in length	7.21 Toys with electrical cables exceeding 300 mm in length (see 5.4.6)	—
B.2.23 Toys with cords intended for children 18 months and over but under 36 months	7.22 Toys with cords or chains intended for children of 18 months and over but under 36 months (see 5.4.3)	—
B.2.25 Toys intended to be attached to a cradle, cot, perambulator or carriage	7.23 Toys intended to be attached to a cradle, cot or perambulator (see 5.4.9.2)	5.6 Mobiles 6.3 Mobiles

6.12.2 Length of cords, loops, nooses and tangled loops

The comparison of requirements for length of cords, loops, nooses and tangled loops is illustrated in [Table 54](#).

Table 54 — Comparison of requirements for length of cords, loops, nooses and tangled loops

Requirement		ISO 8124-1	EN 71-1		ASTM F963
Cords in toys intended for children under 18 months	Cord with the potential to tangle	Length of cord: 220 mm NOTE Where two or more cords with the potential to tangle are attached to the toy in the same position (e.g. using the same fixing point or same stitching), the total of the two longest individual cord lengths, each measured from the fixing point, shall be considered as one cord length for the purpose of this requirement	1 cord or chain with the potential to tangle	Length of cord: 220 mm	Length of cord: 12 in. (300 mm) If cords or multiple cords can tangle or form a loop in connection with any part of the toy, including beads or other attachments on the ends of cords, the loop shall not permit the passage of the head probe
	Other cords but excluded cords on pull toys (cords with free ends)	Length of cord: 300 mm NOTE Where two or more cords are attached to the toy in the same position (e.g. using the same fixing point or same stitching), each cord length, measured from the fixing point, is considered a separate cord	2 cords or chains with the potential to tangle	Not be able to make contact at the tangle point when test with "Gauge X" or combined length: 220 mm	
			Length of cord: 300 mm		

Table 54 (continued)

Requirement		ISO 8124-1	EN 71-1		ASTM F963
Cords in toys intended for children of 18 months and over but under 36 months	Cord with the potential to tangle	Length of cord: 300 mm NOTE Where two or more cords with the potential to tangle are attached to the toy in the same position (e.g. using the same fixing point or same stitching), the total of the two longest individual cord lengths, each measured from the fixing point, shall be considered as one cord with their lengths combined for the purpose of this requirement	1 cord or chain with the potential to tangle	Length of cord: 300 mm	NOT SPECIFIED
			2 cords or chains with the potential to tangle	Combined length (perimeter of tangled loop): 300 mm Two cords or chains can't be touched by using "Gauge X" while under a 25 N ±2 N force on cords or chains	
			Warning is required if length/combined length of cord(s) exceeding 220 mm, but not exceeding 300 mm		
Other cords but excluding cords on pull toys	Warning is required if length of cord exceeding 300 mm NOTE Where two or more cords are attached to the toy in the same position (e.g. using the same fixing point or same stitching), each cord length, measured from the fixing point, is considered a separate cord	Warning is required if length of cord exceeding 300 mm			
Other cords without a free end	Warning is required if length of cord exceeding 220 mm, but not exceeding 300 mm	Warning is required if length/combined length of cord(s) exceeding 220 mm, but not exceeding 300 mm		NOT SPECIFIED	

STANDARDSISO.COM Click to view the full PDF of ISO/TR 8124-9:2020

Table 54 (continued)

Requirement	ISO 8124-1	EN 71-1		ASTM F963
Fixed loops and nooses intended for children under 36 months	(1) Cords that comprised fixed loops or nooses on toys as received shall not permit the passage of the head probe, or (2) Be separated such that the loop or noose is no longer intact	With single fixing point or with fixing points less than 94 mm apart	Perimeter: 380 mm	(1) If cords or multiple cords can tangle or form a loop in connection with any part of the toy, including beads or other attachments on the ends of cords, the loop shall not permit the passage of the head probe (2) Cords, straps, and elastics on toys that have loops that admit the base of the head probe shall contain a functional breakaway feature that prevents entanglement by releasing at a force less than 5,0 lbf (22,2 N) NOTE The requirement is applicable to toys intended for children under 18 months only
		With fixing points of 94 mm or more apart	Distance "d" not exceeding 96 mm when measured according to 8.36.2.2	
		Or be separated such that the loop or noose is no longer intact.		
Tangled loops	Cords formed tangled loop shall comply with either the requirements of "Cords in toys intended for children under 18 months" or "Cords in toys intended for children of 18 months and over but under 36 months"	1) Shall comply with either the requirements of "Cords in toys intended for children under 18 months" or "Cords in toys intended for children of 18 months and over but under 36 months" 2) Shall comply with the requirements of "Fixed loops and nooses"		

- a) EN 71-1 addresses requirements for cords and chains, specifically mentioning chains in each clause and requirement. ISO 8124-1 includes the term "chain" in the definition of a cord. ASTM F963 does not specifically address chains in these requirements.
- b) EN 71-1 specifies that the combined length of two cords with potential to tangle and tangled loops formed by two cords should not exceed 220 mm (toys intended for children under 18 months) or 300 mm (toys intended for children of 18 months or over but under 36 months). ISO 8124-1 specifies that the length of each cord with potential to tangle should not exceed 220 mm (toys intended for children under 18 months) or 300 mm (toys intended for children of 18 months or over but under 36 months); unless the cords are connected in the same position. In cases where two or more cords are connected in the same position, the longest two cords shall be measured as if they were one cord with their length combined. ASTM F963 specifies that the length of individual cords cord should not exceed 12 in. (300 mm), as well as a requirement to not allow the passage of head probe through a tangled loop.
- c) ISO 8124-1 and ASTM F963 have the same requirements on fixed loops and nooses which do not allow the passage of head probe. However, the requirement in ASTM F963 is applicable to toys intended for children under 18 months only, whereas the requirements in ISO 8124-1 apply to toys for children under 36 months. EN 71-1 specifies that the perimeter of fixed loops and nooses should either not exceed 380 mm (with single fixing point on toy or with fixing points less than 94 mm apart), or a distance "d" not exceeding 96 mm when measured according to 8.36.2.2 (fixed to a toy at points 94 mm or more apart).
- d) ISO 8124-1 and EN 71-1 require that toys (excluding pull-along toys) intended for children over 18 months but under 36 months, having cords or chains with a free end and a free length exceeding 300 mm, shall carry a warning indicating the strangulation hazard of long cords. ASTM F963 requires that all cords or elastics included with or attached to toys intended for children less than 18 months of age (excluding pull toys, see ASTM F963:2017, 4.14.3) shall be less than 12 in. (300 mm) long when measured to the maximum length in a free state and under a load of 5 lb (2,25 kg), and so do not specify any warning.

6.12.3 Diameter of certain cords intended for children under 36 months

ISO 8124-1 and EN 71-1 have the same diameter requirements for cords connected to a self-retraction mechanism and cords in pull-along toys only (an average cross-sectional dimension of 1,5 mm). ASTM F963 does not contain a cord diameter requirement.

6.12.4 Self-retracting cords

ISO 8124-1 and EN 71-1 have the same requirements on self-retracting cords. ASTM F963 has requirements for self-retracting cords, but the requirements and test methods are not in full alignment when compared with ISO 8124-1 and EN 71-1. See [Table 55](#).

Table 55 — Self-retracting cord requirements

	ISO 8124-1	EN 71-1	ASTM F963	
Age grade	For children under 36 months of age	For children under 36 months of age	For children under 18 months of age	
Load	Attach a mass of (1 ± 0,1) kg to the free end of the cord	Attach a mass of (1 ± 0,1) kg to the free end of the cord	For monofilament cords greater than 1/16 in. (2 mm) in diameter: a weight of 2 lb (0,9 kg) is attached to the fully extended cord with the cord held vertical and the toy held firmly in the most favorable position for retraction	For monofilament cords less than or equal to 1/16 in. (2 mm) in diameter: apply a load of 1 lb (0,45 kg) in the same manner
	The force of self-retraction mechanisms for cords in toys shall not retract the cord by more than 6 mm under any of the testing conditions specified in 5.11.5 (self-retracting cords) Determine whether the recoil mechanism is able to lift the mass by retracting the cord by more than 6 mm, under any of the following conditions:	The force of self-retraction mechanisms for cords or chains on toys shall not retract the cord or chain more than 6 mm under any of the testing conditions specified in 8.39 (self-retracting cords) Determine whether the recoil mechanism is able to lift the mass by retracting the cord or chain more than 6 mm, under any of the following conditions:		
Assessment	<ul style="list-style-type: none"> — with the cord extracted from the mechanism to the extent of 20 mm — with the cord extracted from the mechanism for a length equal to half of its maximum extractable length — with the cord extracted from the mechanism to its maximum extent 	<ul style="list-style-type: none"> — with the cord or chain extracted from the mechanism to the extent of 20 mm — with the cord or chain extracted from the mechanism for a length equal to half of its maximum extractable length — with the cord or chain extracted from the mechanism to its maximum extent 	Shall not retract more than ¼ in. (6 mm)	Shall not retract

6.12.5 Toys attached to or intended to be strung across, or otherwise attached to a cradle, cot, perambulator or carriage

ISO 8124-1 and EN 71-1 have a broader application than ASTM F963, and the warning statement wording varies. See [Table 56](#).

Table 56 — Toys attached to or intended to be strung across or otherwise attached to a cradle, cot, perambulator or carriage

Requirement	ISO 8124-1	EN 71-1	ASTM F963
Toys intended to be strung across a cradle, cot, perambulator or carriage shall carry a warning	Toys intended to be strung across a cradle, cot, perambulator or carriage shall carry a warning	Toys intended to be strung across a cradle, cot or perambulator shall carry a warning (see 7.11)	1) Crib and Playpen Toys This requirement is applicable to toys intended to be strung across a crib or playpen by means of string, cord, elastic, or straps (including, but not limited to, crib exercisers, crib gyms, and activity toys)
Labelling on toys (B.2.10):	Labelling on toys (B.2.10): “Warning! To prevent possible strangulation or injury by entanglement, remove this toy when the child starts trying to get up on its hands and knees in a crawling position.”	Labelling on the toys and their packages (7.11): “Warning. To prevent possible injury by entanglement, remove this toy when child starts trying to get up its hands and knees in a crawling position.”	Labelling (5.5): On toys and packages: From birth to 5 months. On toys: WARNING. Possible entanglement or strangulation. Remove toy when baby begins to push up on hands and knees.
Toys intended to be strung across a cradle, cot, perambulator or carriage			2) Stroller and Carriage Toys Toys intended exclusively to be strung across strollers or carriages by means of string, cords, elastic, or straps Labelling (5.7): On toys: WARNING. Possible entanglement or strangulation injury when attached to crib or playpen. Do not attached to crib or playpen.

Table 56 (continued)

Requirement	ISO 8124-1	EN 71-1	ASTM F963
Toys otherwise intended to be attached to a cradle, cot, perambulator or carriage	<p>Toys intended to be attached to, but not strung across, a cradle, cot, perambulator or carriage, where any attached cords do not comply with the requirements of 4.11.2 to 4.11.8, shall bear a warning stating that they are to be affixed so that the cords are out of the reach of children and that they are to be removed before the child can reach them</p> <p>Labelling on the toys and their packages (B.2.25):</p> <p>“Warning! Attach this toy out of reach of the child. To prevent possible strangulation or injury by entanglement, remove this toy when the child starts trying to get up on its hands and knees in a crawling position.”</p>	<p>Toys intended to be attached to, but not strung across, a cradle, cot or perambulator, where any attached cords or chains do not comply with the requirements of clauses 5.4.2 to 5.4.8, shall bear a warning stating that these toys are to be affixed so that the cords are out of the reach of children and that the toy is to be removed before the child can reach the cords</p> <p>Labelling on the toys and their packages (7.23):</p> <p>“Warning. Attached this toy out of the reach of the child. To prevent possible injury by entanglement, remove this toy when the child starts trying to get up on its hands and knees in a crawling position.”</p>	<p>This section addresses all mobiles intended to be attached to a crib, playpen, wall, or ceiling.</p> <p>Labelling (5.6):</p> <p>On toys and packages:</p> <p>From birth to 5 months.</p> <p>On toys and packages:</p> <p>WARNING. Possible entanglement injury. Keep out of baby’s reach. Remove mobile from crib or playpen when baby begins to push up on hands and knees.</p>

6.12.6 Cords on pull toys

ISO 8124-1 and EN 71-1 have the same requirements. ASTM F963 is not in alignment with ISO 8124-1 and EN 71-1. See [Table 57](#).

Table 57 — Cords and chains on pull-along toys

ISO 8124-1	EN 71-1	ASTM F963
Cords on pull toys intended for children under 36 months shall have a free length not exceeding 800 mm when measured	Cords and chains with a free end (i.e. with no attachments) on pull-along toys intended for children under 36 months shall have a free length not exceeding 800 mm when measured	Cords, straps, and elastics greater than 12 in. (300 mm) long for pull toys intended for children under 36 months of age shall not be provided with beads or other attachments that could tangle to form a loop

6.12.7 Cords on toy bags

ISO 8124-1 and ASTM F963 have same requirements. EN 71-1 is generally in alignment with ISO 8124-1 and ASTM F963 but there is a minor difference in the opening perimeter specified. EN 71-1 requires that toy bags with opening perimeter >380 mm shall not have a drawstring or cord as a means of closure, while for ISO 8124-1 and ASTM F963, toy bags have the same requirement but where the opening perimeter is >360 mm. However, ASTM F963 requirements only apply to toy bags intended for children up to 18 months. See [Table 58](#).

EN 71-1:2014+A1:2018 provides an option to have ventilation holes that conform with the requirements given in 4.14.2 a) (Masks and Helmets) in order to conform with this clause. ISO 8124-1 and ASTM F963 do not have the same possibility.

Table 58 — Cords on toy bags

ISO 8124-1	EN 71-1	ASTM F963
Toy bags made of impermeable material with an opening perimeter greater than 360 mm shall not have a drawstring or a cord as a means of closing	Toy bags with an opening perimeter greater than 380 mm having a drawstring as a means of closure shall either: <ul style="list-style-type: none"> a) be made of material permeable to air, or b) comply with requirements given in 4.14.2 a) (masks and helmets) 	Only for children up to 18 months Toy bags made of impermeable material with an opening perimeter greater than 14 in. (360 mm) shall not have a drawstring or cord as a means of closing

6.12.8 Cords, strings and lines for flying toys

EN 71-1 and ASTM F963 are generally in alignment, but there are variances in both the applicable parameters as well as the test conditions. See [Table 59](#).

Table 59 — Comparison of cords, strings and lines for flying toys

	ISO 8124-1	EN 71-1	ASTM F963
Length	Hand-held cords, strings and lines over 1,8 m long, attached to toy kites or other flying toys	Cords of toy kites and other flying toys linking the toy to the child and with a length of more than 2 m	Kite strings and hand-held lines over 6 ft (1,8 m) long, attached to flying devices intended for use as playthings
Test conditions	Condition the samples for 7 h minimum at a temperature of (25 ± 3) °C and at a relative humidity of 50 % to 65 % and perform the test in this atmosphere	Condition the samples for 7 h or more at a temperature of (25 ± 3) °C and at a relative humidity of 50 % to 65 % and perform the test in this atmosphere	Tested at a relative humidity of not less than 45 % and a temperature of not greater than 75 °F (24 °C)
Requirement	Shall have an electrical resistance of more than 10^8 Ω/cm	Shall be made of material with an electric resistance exceeding 100 MΩ/cm of cord	Shall have an electric resistance of more than 10^8 Ω/cm
Warning	Carry a warning not to be used near overhead power lines or during thunderstorms	"Warning. Do not use near overhead power lines or during thunderstorms."	—

6.12.9 Electrical cables

ISO 8124-1 and EN 71-1 have the same requirements. ASTM F963 has no corresponding requirement. See [Table 60](#).

Table 60 — Comparison of electrical cables

	ISO 8124-1	EN 71-1
Requirement	Electrical cables on toys longer than 300 mm, when measured according to 5.11.2, intended for children 18 months and over shall carry a warning Electrical cables on toys intended for children aged under 18 months shall comply with 4.11, as applicable	Electrical cables on toys longer than 300 mm when measured according to 8.40 intended for children aged 18 months or over shall carry a warning Electrical cables on toys intended for children aged under 18 months shall comply with the remainder of Clause 5.4 as applicable
Warning	"Warning! Strangulation hazard. Long cable."	"Warning. Long cable. Strangulation hazard."

6.12.10 Cord warning

ASTM F963 only has warning requirements for crib mobiles, crib gyms, stroller and carriage toys intended exclusively to be strung across strollers or carriages by means of string, cords, elastic or straps. ISO 8124-1 and EN 71-1 have warning requirements for the following:

- a) toys intended to be attached to or strung across a cradle, cot, or perambulator;
- b) toys otherwise intended to be attached to a cradle, cot, perambulator or carriage;
- c) toys with electrical cables exceeding 300 mm in length and intended for children 18 months and over;
- d) toys with cords or chains over 220 mm in length intended for children of 18 months and over but under 36 months;
- e) toys (excluding pull-along toys) with cords or chains with free ends over 300 mm in length for children of 18 months and over but under 36 months;
- f) sledges and toboggans with cords for pulling.

6.12.11 Test methods and equipment

6.12.11.1 Cross-sectional dimension test

ISO 8124-1 and EN 71-1 provide a cord cross-sectional dimension test for cords connected to a self-retraction mechanism and cords in pull-along toys. The test specifies that a (25 ± 2) N force be applied to the cord while measuring the diameter of the largest cross-section of the cord. The result is the average of measurements at five points along the length of cord (EN 71-1 also specifies the five approximately equidistant points). ASTM F963 does not require this test.

6.12.11.2 Test for fixed loops, nooses and tangled loops

The testing methods and equipment used for the testing of fixed loops, nooses and tangled loops differ between the three standards. The aim of these tests is to assess whether the head of a child can fit through a fixed loop. ISO 8124-1 and ASTM F963 have the same testing methods for fixed loops and nooses to not allow passage of a head probe; however, the size of the head probes is not in alignment. EN 71-1 provides two different test methods which measure the spacing of the loop, described in 8.36.2. See [Table 61](#).

Table 61 — Test methods and equipment used for testing of fixed loops, nooses and tangled loops

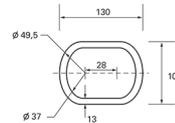
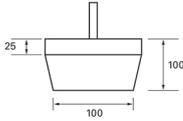
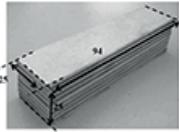
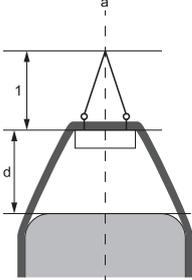
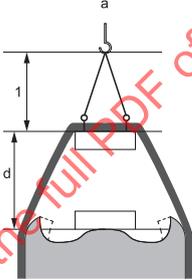
	ISO 8124-1	EN 71-1	ASTM F963
Fixed loops, nooses	Cords that comprise fixed loops or nooses on toys as received shall either: <ul style="list-style-type: none"> a) not permit the passage of the head probe; or b) be separable such that the loop or noose is no longer intact 	1) For cords with single fixing point or with fixing points less than 94 mm apart: According to 8.36.2.1, apply a tension force of (25 ± 2) N to the middle of the cord and measure the perimeter of the loop 2) For cords fixed to a toy at points of 94 mm or more apart: According to 8.36.2.2, measure the distance “d” between the test block and the surface of the toy	The loop shall not permit the passage of the head probe  End view  Side view
	 End view		

Table 61 (continued)

	ISO 8124-1	EN 71-1	ASTM F963
	 <p data-bbox="496 472 616 499">Side view</p>	 <p data-bbox="794 472 1074 499">Test blocks dimension</p>  <p data-bbox="858 808 1011 835">Flat surface</p>  <p data-bbox="826 1144 1043 1171">Irregular surface</p> <p data-bbox="751 1182 1118 1238">3) For tangled loops, measure the combined length</p>	

6.12.11.3 Kite line resistivity test

The tests in the standards are the same with the exception of the preconditioning. ISO 8124-1 and EN 71-1 state that the kite line shall be pre-treated in an environment with a temperature of $(25 \pm 3)^\circ\text{C}$ and humidity of 50 % to 65 % for at least seven hours, and that the test shall be carried out in this environment. ASTM F963 does not require pre-treatment, and the test environment differs from EN 71-1. ASTM F963 requires that the kite line be tested at a relative humidity of not less than 45 % and a temperature not greater than 75°F (24°C).

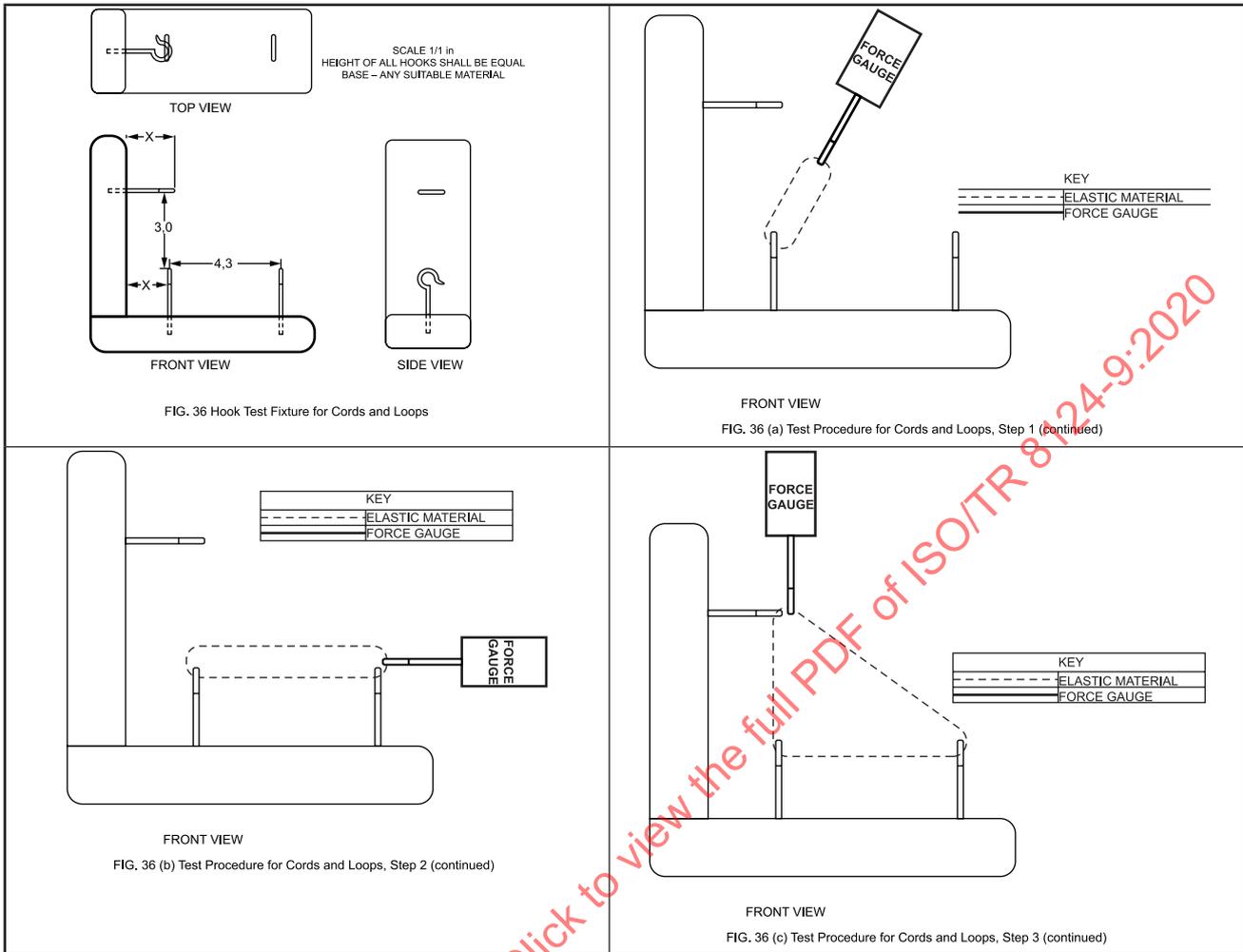
6.12.11.4 Breakaway feature separation test

The test methods for the three standards are nearly identical, with a minor difference in the specified test force. ISO 8124-1 and EN 71-1 apply a force of (25 ± 2) N, while ASTM F963 uses a mass of 5,0 lb (22,2 N).

6.12.11.5 Elastic materials or loops

ISO 8124-1 and ASTM F963 utilize the same test method to stretch elastic materials or loops before applying the head probe test fixture, using slightly different test forces. A 22N force (22,2 N force for ASTM F963) is used, and the test procedure is applied as shown below. If the elastic material cannot be stretched and held in this position or if the force needed to stretch the elastic material exceeds 22 N (22,2 N for ASTM F963), the elastic material conforms with this requirement. The specification of hook test fixtures used by ISO 8124-1 and ASTM F963 are the same. See [Table 62](#).

Table 62 — Test procedure for cords and loops



6.12.12 Toy disguise costumes

EN 71-1 specifies, in addition to the requirements of cords, that toy disguise costumes should conform with the applicable requirements of EN 14682. ISO 8124-1 and ASTM F963 do not have a corresponding requirement.

NOTE Drawstrings in children’s upper outerwear are restricted under the CPSC 16 CFR 1120.3 – Products deemed to be substantial product hazards – Classification of Drawstrings in Children’s Upper Outerwear as a “Substantial Product Hazard”.

6.13 Folding mechanisms

6.13.1 General

The clauses for folding mechanisms are indicated in [Table 63](#).

Table 63 — Clauses related to folding mechanisms

ISO 8124-1	EN 71-1	ASTM F963
4.12 Folding mechanisms See E.17	4.10.1 Folding and sliding mechanisms (see A.11)	4.13 Folding mechanisms and hinges 4.13.1 Folding mechanisms
4.12.1 Toy pushchairs, perambulators and similar toys a) Toys with a handle or other structural member which can fold down over a child	a) Toy pushchairs and perambulators incorporating a handle or other structural member which can fold down over a child	
4.12.1 Toy pushchairs, perambulators and similar toys b) Toy pushchairs and perambulators that do not present a hazard of a handle or other structural member folding down over a child	b) Toy pushchairs and perambulators that do not otherwise constitute a hazard of a handle or other structural member folding down over a child	
4.12.2 Other toys with folding mechanisms	c) Folding devices on other collapsible toys (e.g. ironing boards, folding chairs and tables, etc.) which may have a scissor-like action d) Toys other than those covered by 4.10.1 a), b) or c), with folding or sliding mechanisms intended to bear or capable of bearing the mass of a child and capable of injuring fingers	
5.22.2 Toy pushchairs and perambulators	8.18.2 Toy pushchairs and perambulators	
5.22.3 Other toys with folding mechanisms	8.18.3 Other collapsible toys (see 4.10.1 c)	
4.12.3 Hinge-line clearance	4.10.3 Hinges (See A.13)	4.13.2 Hinge-line clearance

In addition, EN 71-1 states in the informative rationale that the requirement is also applicable to, for example, the hinge line assembling the front fork and the bike frame in so called balance bikes.

6.13.2 Hinge line clearance

The requirements for hinge line clearance are similar across the referenced standards. The requirements in EN 71-1 and ISO 8124-1 do not apply if any part joined by one or more hinges has a mass of less than 250 g. The requirement in ASTM F963 does not apply if the moveable portion weighs less than 0,5 lb. See [Table 64](#) for an abbreviated comparison of the requirements.

Table 64 — Hinge line clearance

Item	ISO 8124-1	EN 71-1	ASTM F963
Exemption	Less than 0,25 kg	Less than 0,25 kg	Moveable portion that weighs less than ½ lb (0,2 kg)
Requirement	If it admits a 5 mm diameter rod, it shall also admit a 12 mm diameter rod at all positions of the hinge	Shall also allow a 12 mm diameter rod to be inserted if it allows a 5 mm diameter rod to be inserted	If it admits a 3/16 in. (5 mm) diameter rod, it shall also admit a ½ in. (13 mm) diameter rod at all positions of the hinge
Figure for hinge-line	<p>Figure 4 — Hinge-line clearance</p>	<p>Figure 2 — Definition of hinge line</p>	<p>Figure 4 — Hinge-line clearance</p>

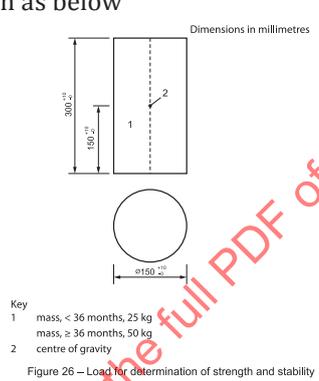
6.13.3 Toy pushchairs, perambulators and similar toys

EN 71-1 and ISO 8124-1 specify the applicable sitting surface width for the requirements. ASTM F963 specifies only that the requirements apply to products likely to support the weight of a child in normal use. For example, a toy stroller with a seat width that would accommodate the hip breadth of a child in the age range for which the product is intended would be covered.

In EN 71-1 and ISO 8124-1, toy pushchairs and perambulators incorporating a handle or other structural member which can fold down over a child, shall have at least one main locking device and at least one secondary locking device, both of which shall act directly on the folding mechanism. At least one of the locking devices should automatically engage when the toy is erected. Toy pushchairs and perambulators that do not present the hazard of a handle or other structural member folding down over a child shall have at least a locking device or a safety stop, which may be manual in operation.

ASTM F963 requires that these kinds of toys have a single-action or double-action locking device. The locking devices shall engage automatically and each single-action device shall require a minimum force of 10 lbf (45 N) to activate the release mechanism. See [Table 65](#).

Table 65 — Different test methods for toy pushchairs, perambulators and similar toys and other toys with folding mechanisms

Item	ISO 8124-1	EN 71-1	ASTM F963
Precondition	Erecting and folding toys 10 times	Erecting and folding toys 10 times	—
Load and test duration	<p>Mass, ≥36 months (50 ± 0,5) kg</p> <p>Mass, <36 months (25 ± 0,2) kg</p> <p>Load evenly over 5 s and maintain for 5 min</p> <p>No information on dimensions of the load is given in the standard</p>	<p>Mass, ≥36 months (50 ± 0,5) kg</p> <p>Mass, <36 months (25 ± 0,2) kg</p> <p>Apply the load for 5 min</p> <p>The dimensions of the load are given as below</p>  <p>Key 1 mass, < 36 months, 25 kg 2 mass, ≥ 36 months, 50 kg 2 centre of gravity</p> <p>Figure 26 – Load for determination of strength and stability</p>	<p>Apply a force of 45 lbf (200 N)</p> <p>Apply force gradually over a 5 s period and maintain for an additional 10 s</p> <p>Perform this procedure five times within a 2 min period</p>
Placement of toy	<p>Toy pushchairs and perambulators: Erect the toy on a horizontal surface</p> <p>Other toys with folding mechanisms:</p> <p>a) Erect the toy. Lift the toy and observe whether the locking device disengages when the toy is tilted in any (30 ± 1)° angle from the horizontal</p> <p>b) Erect the toy and position it on a surface inclined (10 ± 1)° in the most onerous position with respect to the folding parts</p>	<p>Erect the product in accordance with the manufacturer's instructions</p> <p>Secure the product so that the normal folding motion is not impeded</p>	
Load position	<p>Toy pushchairs and perambulators: Ensuring that the load is borne by the frame, If the seat of the body is detachable from the chassis, this test shall also be performed on the chassis only</p> <p>Other toys with folding mechanisms:</p> <p>Apply the load wherever it is possible for a child to sit and in the most onerous position with respect to the folding parts. Ensure that the load is borne by the frame. Where necessary, use support so that the seat material is not damaged</p>	<p>Apply a force of 45 lbf (200 N) to the product, but not to the mechanism itself, in the direction normally associated with folding</p>	
Locking device testing	<p>After loading test on the toy, determine whether the toy collapses and whether the locking device or safety stop is still operable and engaged</p> <p>There is no specific test to apply only on locking device or safety stop.)</p>	<p>With the product in the manufacturer's recommended use position, gradually apply a force of 10 lbf (45 N) to the locking mechanism in the direction tending to unlock it. The locking mechanism shall not unlock until a minimum force of 10 lbf (45 N) has been achieved</p>	

6.13.4 Requirement for folding devices having a scissor-like action

Only EN 71-1 points out an additional requirement for clearance between moveable parts in folding devices on collapsible toys which may have a scissor-like action, requiring that those parts have a clearance of 12 mm or more between them.

6.14 Holes, clearances and accessibility of mechanisms

6.14.1 General

The clauses for holes, clearances and accessibility of mechanisms are indicated in the [Table 66](#).

Table 66 — Clauses related to holes, clearances and accessibility of mechanisms

ISO 8124-1	EN 71-1	ASTM F963
4.13 Holes, clearances and accessibility of mechanisms	—	4.18 Holes, clearance, and accessibility of mechanisms
4.13.1 Circular holes in rigid materials See E.20	—	4.18.2 Circular holes in rigid materials
4.13.2 Accessible clearances for moveable segments See E.21	4.15.1.6 Transmission and wheel arrangement c)	4.18.1 Accessible clearances for moveable segments
4.13.3 Chains or belts in ride-on toys See E.22	4.15.1.6 Transmission and wheel arrangement 4.15.1.6 a) 4.15.1.6 b) 4.15.1.6 d)	4.18.3 Chains and belts 4.18.3.1 Supporting chains 4.18.3.2 Chains or belts for ride-on toys
4.13.4 Other driving mechanisms See E.23	4.10.2 Driving mechanisms (see A.12) 4.10.2 a) 4.10.2 b)	4.18.4 Inaccessibility of mechanisms
4.13.5 Winding keys See E.24	4.10.2 c)	4.18.5 Winding keys 3.1.2 Accessible

6.14.2 Holes, clearances and accessibility of mechanisms

The scope of the requirements in ISO 8124-1 and ASTM F963 are almost the same. ASTM F963 includes a coil spring requirement which is also covered in ISO 8124-1:2018, 4.14.

Without considering the unit conversion, the requirements for holes and accessible clearances for moveable segments in ISO 8124-1 and ASTM F963 are same. Both ISO 8124-1 and ASTM F963 define the term “rigid” as any material having a hardness exceeding 70 Shore A.

EN 71-1 does not have corresponding requirement for holes except for specific restrictions on the drainage hole on the transmission shield of ride-on toys.

6.14.3 Accessible clearances for moveable segments

The requirement in ASTM F963 only applies to clearances between moveable segments on toys intended for children under 96 months where the potential of pinching or crushing fingers or other appendages exists. ISO 8124-1:2018, E.21 explains a similar application.

The informative subclause ISO 8124-1:2018, E.21 states that this requirement applies (but is not limited) to ride-on toys powered by electrical, spring or inertial energy. A similar explanation appears in ASTM F963. The requirements for transmission and wheel arrangements in EN 71-1 are restricted to toys intended to bear the mass of a child, while the other two standards do not specify limits to the requirement for these toys. See [Table 67](#).

Table 67 — Differences in accessible clearances for moveable segments

ISO 8124-1	EN 71-1	ASTM F963
E.21 Accessible clearances for moveable segments	4.15.1.6 Transmission and wheel arrangement	4.18.1 Accessible clearances for moveable segments
It includes, but is not limited to, wheels and rigid-wheel wells, fenders or the radial clearance between the wheels and chassis of ride-on toys powered by electrical, spring or inertial energy	Spaces between the wheels and the body or parts of the body (e.g. mudguards) This requirement does not apply to the friction surfaces of braking mechanisms, toy skateboards or roller skates	It includes, but is not limited to, wheels and rigid-wheel wells, fenders, or the radial clearance between the wheels and chassis of ride-on toys, or the driven wheels and other parts of toys powered by electrical, spring, or inertial energy
If accessible clearances for moveable segments can admit a 5 mm diameter rod, they shall also admit a 12 mm diameter rod	Spaces shall also allow a 12 mm diameter rod to be inserted if they allow a 5 mm diameter rod to be inserted	If such accessible clearances admit a 3/16 in. (5 mm) diameter rod, they shall also admit a 1/2 in. (13 mm) diameter rod

6.14.4 Chains or belts in ride-on toys

ISO 8124-1 and EN 71-1 define the requirements for the shielding of power transmission chains and belts in ride-on toys. ASTM F963 mentions only that power transmission chains and belts in ride-on toys shall be shielded.

6.14.5 Other driving mechanisms

The requirement is applicable for all ages in ISO 8124-1 and EN 71-1. The requirement in ASTM F963 only applies to toys intended for children aged 60 months or less.

ASTM F963 and EN 71-1 state that the requirement does not apply to driving mechanisms with insufficient power to injure fingers or other parts of the body. The informative subclause ISO 8124-1:2018, E.21 lists a similar scope.

6.14.6 Winding keys

The intended age applicability is different between the three referenced standards. The requirement applies to toys for children of all ages in EN 71-1 and is only applicable to toys for children under 36 months in ISO 8124-1 and ASTM F963. This requirement also applies to starting handles in EN 71-1.

In ISO 8124-1 and EN 71-1, the requirement states that if the clearance between the key and the toy can admit a 5 mm rod, it shall also admit a 12 mm rod in. For ASTM F963, the requirement states that if the clearance can admit a 0,25 in. (6 mm) rod, it shall also admit a 0,5 in. (13 mm) rod.

6.14.7 Toy bicycles and tricycles provided with a handle that can be used for pushing the child

In EN 71-1, toy bicycles and tricycles provided with a handle that can be used for pushing the child shall be constructed in such a way as to prevent entrapment of the child's feet in the pedals, for example, while being pushed. Examples include having pedals that can be disengaged from the hub, an adjustable free-wheeling mechanism or foot rests. For designs other than those only involving foot rests, the toy shall be accompanied by instructions for use which draw attention to the hazards of not making the correct adjustments when the push handle is removed. ISO 8124-1 does not have any corresponding

requirements for toy bicycles and tricycles, and toy bicycles and tricycles are not included within the scope of ASTM F963.

NOTE For the USA, toy bicycles are covered by 16 CFR 1512 and tricycles are covered by ANSI Z315.1.

6.15 Springs

The clauses for springs are indicated in [Table 68](#).

Table 68 — Clauses related to springs

ISO 8124-1	EN 71-1	ASTM F963
4.14 Springs	4.10.4 Springs (See A.14)	4.18.6 Coil springs

The requirements in ASTM F963 only apply to coil springs which can carry the weight of a child, while those in ISO 8124-1 and EN 71-1 also apply to spiral and helical springs without any exemption for springs that do not carry the weight of a child.

6.16 Stability and overload requirements

6.16.1 Stability requirements for ride-on toys and seats

6.16.1.1 General

The clauses for the stability of ride-on toys and seats are indicated in [Table 69](#).

Table 69 — Clauses related to stability and overload requirements

ISO 8124-1	EN 71-1	ASTM F963
4.15 Stability and overload requirements 4.15.1 Stability of ride-on toys and seats	4.15 Toys intended to bear the mass of a child (see A.20)	4.15 Stability and over-load requirements
4.15.1.1 Sideways stability, feet available for stabilization See E.26 5.12.2 Sideways stability test, feet available for stabilization	4.15.1.4 Stability 8.23.1 Toys intended to bear the mass of a child (see 4.15.1.4, 4.15.3 and 4.15.4) 4.15.3 Rocking horses and similar toys (see A.21) 4.15.4 Toys not propelled by a child	4.15.1 Stability of ride-on toys and toy seats 4.15.2 Sideways stability requirements 8.15 Test for stability of ride-on toys or toy seats
4.15.1.2 Sideways stability, feet unavailable for stabilization 5.12.3 Sideways stability test, feet unavailable for stabilization		
4.15.1.3 Fore and aft stability See E.27 5.12.4 Fore and aft stability test		4.15.3 Fore and aft stability 8.15 Test for stability of ride-on toys or toy seats

6.16.1.2 Stability testing

See [Table 70](#) for the differences in stability testing between the referenced standards.

Table 70 — Differences of the test method for stability testing

		ISO 8124-1	EN 71-1	ASTM F963																														
Scope		The stability requirement applies to ride-on toys, rocking toys (e.g. rocking horses) and stationary toys with seats, such as play furniture intended for children under 60 months	Toys intended to bear the mass of a child, e.g.: <ul style="list-style-type: none"> — roller skates, inline skates and skateboards intended for children with a body mass of 20 kg or less — tricycles, cars, hand carts, moon-hoppers and pogo sticks 	The stability requirement applies to the following classes of toys intended for use by children aged 60 months or less: ride-on toys, with three or more load bearing wheels, such as wagons; ride-on, action-type toys such as hobby horses, rocking toys (for example, horses, cars); and toy seats																														
Exemption		Ride-on toys of spherical, cylindrical or other shapes, which do not normally have a stable base e.g. toy bicycles and similar toys) are not covered by these requirements	The stability requirement does not apply to: <ul style="list-style-type: none"> — roller skates, inline skates and toy skateboards — toys that by their design do not have a stable base (e.g. pogo sticks, moon hoppers, big balls and soft filled toy animals) — toys with aligned wheels Wheels with a spacing of 150 mm or less between the centre of the outermost wheels are considered to be a single wheel	Ride-on toys of spherical, cylindrical or other shape that do not normally have a stable base are not covered by these requirements																														
Sideways stability, feet available for stabilization	Angle of incline	Place the toy on a smooth surface inclined $(10^{+0,5}_{0,0})^\circ$	Place the toy on a $(10 \pm 1)^\circ$ slope	Place the ride-on toy or toy seat across the slope of a smooth surface inclined 10°																														
	Test load	Age group	Age group	<table border="1"> <caption>TABLE 6 Weight of 95th Percentile Children (Values Given for Boys or Girls, Whichever is Higher)</caption> <thead> <tr> <th>Age, years</th> <th>Weight, lb (kg)</th> </tr> </thead> <tbody> <tr><td>1</td><td>28 (12.5)</td></tr> <tr><td>2</td><td>29 (13.2)</td></tr> <tr><td>3</td><td>42 (18.9)</td></tr> <tr><td>4</td><td>43 (19.7)</td></tr> <tr><td>5</td><td>50 (22.6)</td></tr> <tr><td>6</td><td>59 (26.6)</td></tr> <tr><td>7</td><td>69 (31.2)</td></tr> <tr><td>8</td><td>81 (37.0)</td></tr> <tr><td>9</td><td>89 (40.4)</td></tr> <tr><td>10</td><td>105 (47.5)</td></tr> <tr><td>11</td><td>121 (55.0)</td></tr> <tr><td>12</td><td>120 (54.7)</td></tr> <tr><td>13</td><td>140 (63.5)</td></tr> <tr><td>14</td><td>153 (69.6)</td></tr> </tbody> </table>	Age, years	Weight, lb (kg)	1	28 (12.5)	2	29 (13.2)	3	42 (18.9)	4	43 (19.7)	5	50 (22.6)	6	59 (26.6)	7	69 (31.2)	8	81 (37.0)	9	89 (40.4)	10	105 (47.5)	11	121 (55.0)	12	120 (54.7)	13	140 (63.5)	14	153 (69.6)
		Age, years	Weight, lb (kg)																															
	1	28 (12.5)																																
2	29 (13.2)																																	
3	42 (18.9)																																	
4	43 (19.7)																																	
5	50 (22.6)																																	
6	59 (26.6)																																	
7	69 (31.2)																																	
8	81 (37.0)																																	
9	89 (40.4)																																	
10	105 (47.5)																																	
11	121 (55.0)																																	
12	120 (54.7)																																	
13	140 (63.5)																																	
14	153 (69.6)																																	
	Load (kg)	Load (kg)																																
	Under 36 months	$25 \pm 0,2$	Under 36 months	$25 \pm 0,2$																														
	36 months and over	$50 \pm 0,5$	36 months and over	$50 \pm 0,5$																														
	Determination	Observe whether the toy tips over within 1 min after application of the load	Determine whether the toy tips over	Determine whether the ride-on toy or toy seat tips																														

Table 70 (continued)

		ISO 8124-1	EN 71-1	ASTM F963																																
	Exemption	Ride-on toys and stationary toys with seats, where the height of the seat from the ground is less than 27 cm	Toys intended for children 36 months and over where the feet of the child can provide sideways stability (i.e. where the legs are unrestricted in their sideways motion) and where the height of the seat is such that a child of the age group for which the toy is intended can reach the ground with both feet when seated (with fore and aft stability remaining)	Those ride-on toys or toy seats in which the height of the seat from the ground is one third, or less than one third, of the height indicated in below table at the lowest age of the age range for which the ride-on toy or toy seat is intended <table border="1"> <caption>TABLE 3 Height of Fifth Percentile Children (Values Given for Boys or Girls, Whichever is Higher)</caption> <thead> <tr> <th>Age, years</th> <th>Height, in. (cm)</th> </tr> </thead> <tbody> <tr><td>1</td><td>27 (69,8)</td></tr> <tr><td>2</td><td>29 (74,4)</td></tr> <tr><td>3</td><td>32 (81,3)</td></tr> <tr><td>4</td><td>37 (93,8)</td></tr> <tr><td>5</td><td>40 (101,5)</td></tr> </tbody> </table>	Age, years	Height, in. (cm)	1	27 (69,8)	2	29 (74,4)	3	32 (81,3)	4	37 (93,8)	5	40 (101,5)																				
Age, years	Height, in. (cm)																																			
1	27 (69,8)																																			
2	29 (74,4)																																			
3	32 (81,3)																																			
4	37 (93,8)																																			
5	40 (101,5)																																			
Sideways stability, feet unavailable for stabilization	Angle of incline	Place the toy on a smooth surface inclined $(15^{+0,5}_{0,0})^\circ$	Place the toy on a $(10 \pm 1)^\circ$ slope	Place the ride-on toy or toy seat across the slope of a smooth surface inclined 15°																																
	Test load	Age group	Load (kg)	Age group	Load (kg)	<table border="1"> <caption>TABLE 6 Weight of 95th Percentile Children (Values Given for Boys or Girls, Whichever is Higher)</caption> <thead> <tr> <th>Age, years</th> <th>Weight, lb (kg)</th> </tr> </thead> <tbody> <tr><td>1</td><td>28 (12,6)</td></tr> <tr><td>2</td><td>29 (13,2)</td></tr> <tr><td>3</td><td>42 (18,9)</td></tr> <tr><td>4</td><td>43 (19,7)</td></tr> <tr><td>5</td><td>50 (22,6)</td></tr> <tr><td>6</td><td>59 (26,6)</td></tr> <tr><td>7</td><td>69 (31,2)</td></tr> <tr><td>8</td><td>81 (37,0)</td></tr> <tr><td>9</td><td>89 (40,4)</td></tr> <tr><td>10</td><td>105 (47,9)</td></tr> <tr><td>11</td><td>121 (55,0)</td></tr> <tr><td>12</td><td>130 (54,7)</td></tr> <tr><td>13</td><td>140 (63,6)</td></tr> <tr><td>14</td><td>152 (69,0)</td></tr> </tbody> </table>	Age, years	Weight, lb (kg)	1	28 (12,6)	2	29 (13,2)	3	42 (18,9)	4	43 (19,7)	5	50 (22,6)	6	59 (26,6)	7	69 (31,2)	8	81 (37,0)	9	89 (40,4)	10	105 (47,9)	11	121 (55,0)	12	130 (54,7)	13	140 (63,6)	14	152 (69,0)
		Age, years	Weight, lb (kg)																																	
	1	28 (12,6)																																		
2	29 (13,2)																																			
3	42 (18,9)																																			
4	43 (19,7)																																			
5	50 (22,6)																																			
6	59 (26,6)																																			
7	69 (31,2)																																			
8	81 (37,0)																																			
9	89 (40,4)																																			
10	105 (47,9)																																			
11	121 (55,0)																																			
12	130 (54,7)																																			
13	140 (63,6)																																			
14	152 (69,0)																																			
	36 months and over	50 ± 0,5	36 months and over	50 ± 0,5	Apply to the seat a static load equal to the weight indicated in above table at the highest age of the age range for which the ride-on toy or toy seat is intended, but not exceeding 60 months. When the highest age of the intended age range falls between two ages listed in above table, the higher of the two shall be chosen																															
Determination	Observe whether the toy tips over within 1 min after application of the load		Determine whether the toy tips over		Determine whether the ride-on toy or toy seat tip																															
Fore and aft stability	Angle of incline	Place the toy on a smooth surface inclined $(15^{+0,5}_{0,0})^\circ$	Place the toy on a $(10 \pm 1)^\circ$ slope	Place the ride-on toy or toy seat across the slope of a smooth surface inclined 15°																																
	Test load	Age group	Load (kg)	Age group	Load (kg)	<table border="1"> <caption>TABLE 6 Weight of 95th Percentile Children (Values Given for Boys or Girls, Whichever is Higher)</caption> <thead> <tr> <th>Age, years</th> <th>Weight, lb (kg)</th> </tr> </thead> <tbody> <tr><td>1</td><td>28 (12,6)</td></tr> <tr><td>2</td><td>29 (13,2)</td></tr> <tr><td>3</td><td>42 (18,9)</td></tr> <tr><td>4</td><td>43 (19,7)</td></tr> <tr><td>5</td><td>50 (22,6)</td></tr> <tr><td>6</td><td>59 (26,6)</td></tr> <tr><td>7</td><td>69 (31,2)</td></tr> <tr><td>8</td><td>81 (37,0)</td></tr> <tr><td>9</td><td>89 (40,4)</td></tr> <tr><td>10</td><td>105 (47,9)</td></tr> <tr><td>11</td><td>121 (55,0)</td></tr> <tr><td>12</td><td>130 (54,7)</td></tr> <tr><td>13</td><td>140 (63,6)</td></tr> <tr><td>14</td><td>152 (69,0)</td></tr> </tbody> </table>	Age, years	Weight, lb (kg)	1	28 (12,6)	2	29 (13,2)	3	42 (18,9)	4	43 (19,7)	5	50 (22,6)	6	59 (26,6)	7	69 (31,2)	8	81 (37,0)	9	89 (40,4)	10	105 (47,9)	11	121 (55,0)	12	130 (54,7)	13	140 (63,6)	14	152 (69,0)
		Age, years	Weight, lb (kg)																																	
1	28 (12,6)																																			
2	29 (13,2)																																			
3	42 (18,9)																																			
4	43 (19,7)																																			
5	50 (22,6)																																			
6	59 (26,6)																																			
7	69 (31,2)																																			
8	81 (37,0)																																			
9	89 (40,4)																																			
10	105 (47,9)																																			
11	121 (55,0)																																			
12	130 (54,7)																																			
13	140 (63,6)																																			
14	152 (69,0)																																			
	36 months and over	50 ± 0,5	36 months and over	50 ± 0,5																																

Table 70 (continued)

	ISO 8124-1		EN 71-1		ASTM F963
					Apply to the seat a static load equal to the weight indicated in above table at the highest age of the age range for which the ride-on toy or toy seat is intended, but not exceeding 60 months. When the highest age of the intended age range falls between two ages listed in above table, the higher of the two shall be chosen
Toy facing direction	Ride-on toys shall be tested with the steering mechanism, if any, in the position where the toy is most likely to tip Test the toy facing both up and down the slope For rocking horses, displace the toy to the limit of its bow		Place the toy on a slope in the most onerous position with respect to stability		The stability of ride-on toys is to be tested not only with the steering wheels in a forward position, but also at an angle of 45 ° to the left and to the right of the forward position Tested the toy both facing down and up the slope
Load location	For all ride-on toys, secure the centre of gravity of the load both (43 ± 3) mm rearward of the frontmost portion of the designated seating area, and (43 ± 3) mm forward of the rear-most portion of the designated seating area If there is no designated seating area, place the load at the least favourable position in which it is reasonable to anticipate that a child will choose to sit or stand		Load the toy in the most onerous position on its standing or sitting surface		The centre of gravity of the load for the fore and aft stability test shall be secured both 1,7 in. (43 mm) rearward of the front-most portion of the designated seating area and 1,7 in. (43 mm) forward of the rear-most portion of the designated seating area. If there is no designated seating area or if there is no designated fore and aft orientation, the load shall be placed 1,7 in. (43 mm) inward towards the geometric centre of the ride-on toy or toy seat from the least favourable position that it is reasonable to anticipate that the child will choose to sit
Determination	Observe whether the toy tips over within 1 min after application of the load		Determine whether the toy tips over		Determine whether the ride-on toy or toy seat tip

6.16.1.3 Toy orientation

In ISO 8124-1, four directions (forward, backward, left and right) are to be taken into consideration during the stability test. The centre of gravity of the load is secured both (43 ± 3) mm rearward of the front-most portion of the designated seating area, and (43 ± 3) mm frontward of the rear-most portion of the designated seating area.

There are two scenarios addressed in ASTM F963.

- a) For toys with a designated sitting area, the centre of the gravity of the load is placed 43 mm rearward of the front-most portion when doing forward stability testing; and 43 mm frontward of the rear-most portion when doing rearward stability testing. For sideways stability testing, the centre of gravity of the load is placed on the geometric centre of the sitting area.
- b) For toys without a designated sitting area or if there is no designated sideways orientation, the centre of gravity is placed 43 mm inward towards the geometric centre of the toy.

In EN 71-1, the load shall be placed in the most onerous position of the toy on its standing or sitting surface. Additional interpretation on how to place the load is listed in CEN/TR 15371-1.

6.16.1.4 Sitting surface height

In ISO 8124-1, the sideways stability test is not applicable if the height of the seat from the ground is less than 27 cm and the child’s feet can provide sideways stability.

In ASTM F963, the sideways stability test is not applicable if the height of the seat from the ground is one third, or less than one third, of the child’s height which corresponds to the minimum listed for the lowest age of the intended age range.

6.16.1.5 Rocking horses and similar toys

EN 71-1 specifies a limit to the movement on rocking horses and similar toys. It aims to ensure the bow rocker of any bow-mounted rocking horses or other rocking toys has a limit to its movement which shall at all times hold the user within the extremes of the bow. There is currently no corresponding requirement in ISO-8124-1 and ASTM F963.

6.16.1.6 Mass

EN 71-1:2014+A1:2018, A.49 specifies that a body mass of 20 kg corresponds approximately to the mass (95th percentile) of a child of 3 years. ISO 8124-1:2018, E.44 states that, “A body mass of 20 kg corresponds approximately to the average mass of a child of 5 years.” In ASTM F963, the mass (95th percentile) of a 3-year old child is 42 lb (18,9 kg).

6.16.1.7 The height of the center of gravity for loading requirements of ride-on toys and seats

See [Table 71](#).

Table 71 — Height of the centre of gravity of the load

ISO 8124-1	EN 71-1	ASTM F963
Design the load so that the height of its centre of gravity is (220 ± 10) mm above the seat surface	Load’s centre of gravity is 150 ⁺¹⁰ ₋₀ mm	The load shall be designed so that the height of its centre of gravity is (8,7 ± 0,5) in. (220 ± 13) mm

6.16.2 Overload requirements for ride-on toys and seats

6.16.2.1 General

The clauses for ride-on toys and seats are indicated in [Table 72](#).

Table 72 — Clauses related to overload requirements for ride-on toys and seats

ISO 8124-1	EN 71-1	ASTM F963
4.15.2 Overload requirements for ride-on toys and seats See E.28.	No overload requirement	4.15.5 Overload requirements for ride-on toys and toy seats
5.12.5 Overload test for ride-on toys and seats	4.15.1.3 Strength 8.21 Static strength (see 4.15.1.3, 4.15.1.5, 4.15.3, 4.15.4 and A.46)	8.28 Test for overload of ride-on toys and toy seats
5.24.4 Dynamic strength test for wheeled ride-on toys other than toy scooters	8.22 Dynamic strength (see 4.15.1.3)	4.15.6 Wheeled ride-on toys 8.21 Dynamic strength test for wheeled ride-on toys

6.16.2.2 Loading requirements for ride-on toys and seats

The purpose of this requirement is to minimize unexpected hazards which could be caused by a toy that is not capable of withstanding an overload. The relationships between the age range and the test load to be applied are shown in [Table 73](#).

Table 73 — Comparison of loading requirements for ride-on toys and seats

Age years	ISO 8124-1 (Overload) kg	EN 71-1 (Static strength test) kg	ASTM F963 (Overload) lb (kg)
1	35 ± 0,3	25 ± 0,2	28 (12,6)
2			29 (13,2)
3			42 (18,9)
4	80 ± 1,0	50 ± 0,5	43 (19,7)
5			50 (22,6)
6			59 (26,6)
7			69 (31,2)
8			81 (37,0)
9	140 ± 2,0	50 ± 0,5	89 (40,4)
10			105 (47,9)
11			121 (55,0)
12			120 (54,7)
13			140 (63,6)
14			153 (69,6)
NOTE	Conduct the test for overload requirements so that it will be consistent with the advertised mass capacity of the toy, if that mass is higher than the required load according to Table 4	For scooters: (1) For toy scooters labelled as intended for children with a body mass of 20 kg or less: (50 ± 0,5) kg (2) For other toy scooters: (100 ± 1) kg	When the highest age of the intended age range falls between two ages listed in the column for ASTM F963 in this Table, the higher of the two shall be chosen Toy is intended to accommodate only one child, the test load shall be three times the weight indicated in the above units highest age of the age range for which the toy is intended, or three times the manufacturer's stated weight capacity, whichever is greater Toy is intended to accommodate more than one child, the test load shall be two times the weight indicated in the above units at the highest age of the age range for which the toy is intended, or two times the manufacturer's stated weight capacity after it is divided by the number of seating or standing areas, whichever is greater
Test method	Load the toy on its standing or sitting surface with the appropriate mass in accordance with Table 4 Determine whether the toy collapses such that it does not conform to the relevant requirements	Load the toy in the most onerous position with a mass of (50 ± 0,5) kg on its standing or sitting surface for 5 min For toys labelled as not suitable for children of 36 months and over, load the toy with a mass of (25 ± 0,2) kg	Apply a static load(s) that is equal to the weight as determined by the criteria above. The load(s) shall be applied so that it is as close as possible to the geometric centre of the designated seating or standing area(s). If there is no designated seating or standing area(s), the load shall be placed at the least favourable position that it is reasonable to anticipate that the child will choose to sit or stand. Observe whether the toy collapses within 1 min after application of the static load

6.16.2.3 Dynamic strength test

All three referenced standards apply dynamic tests. In EN 71-1, a test load with articulated arms is to be used when the toy is equipped with a steering wheel or handlebars. In ISO 8124-1, the test load with articulated arms is only to be used when conducting the dynamic strength test for toy scooters. There is no corresponding requirement in ASTM F963. See [Table 74](#).

Table 74 — Differences in test methods for dynamic strength test

		ISO 8124-1	EN 71-1	ASTM F963																														
Dynamic strength test	Test Method	Wheeled ride-on toys other than toy scooters Load the toy for 5 min Drive the toy three times at a speed of (2 ± 0,2) m/s into a non-resilient step with a height of 50 mm	A load is secured to the toy, and articulated arms with the elbow joints in a downward position are attached to the steering wheel or handlebars if the toy is so equipped. The toy is driven three times into a non-resilient step	Load the toy for 5 min in the most onerous position with the appropriate mass in accordance with this Table on its standing or sitting surface. Secure the load to the toy in a position corresponding to the normal use of the toy. Drive the toy three times at a speed of 6,6 ft/s (2 m/s) ± 0,7 ft/s (0,2 m/s) into a non-resilient step with a height of 2 in. (50 mm)																														
	Test load	Wheeled ride-on toys other than toy scooter	For toys intended for children of 36 months and over:	<small>TABLE 6 Weight of 95th Percentile Children (Values Given for Boys or Girls, Whichever is Higher)</small> <table border="1"> <thead> <tr> <th>Age, years</th> <th>Weight, lb (kg)</th> </tr> </thead> <tbody> <tr><td>1</td><td>28 (12,6)</td></tr> <tr><td>2</td><td>29 (13,2)</td></tr> <tr><td>3</td><td>42 (18,9)</td></tr> <tr><td>4</td><td>43 (19,7)</td></tr> <tr><td>5</td><td>50 (22,6)</td></tr> <tr><td>6</td><td>59 (26,6)</td></tr> <tr><td>7</td><td>69 (31,2)</td></tr> <tr><td>8</td><td>81 (37,0)</td></tr> <tr><td>9</td><td>89 (40,4)</td></tr> <tr><td>10</td><td>105 (47,5)</td></tr> <tr><td>11</td><td>121 (55,0)</td></tr> <tr><td>12</td><td>120 (54,7)</td></tr> <tr><td>13</td><td>140 (63,3)</td></tr> <tr><td>14</td><td>153 (69,6)</td></tr> </tbody> </table>	Age, years	Weight, lb (kg)	1	28 (12,6)	2	29 (13,2)	3	42 (18,9)	4	43 (19,7)	5	50 (22,6)	6	59 (26,6)	7	69 (31,2)	8	81 (37,0)	9	89 (40,4)	10	105 (47,5)	11	121 (55,0)	12	120 (54,7)	13	140 (63,3)	14	153 (69,6)
		Age, years	Weight, lb (kg)																															
		1	28 (12,6)																															
2	29 (13,2)																																	
3	42 (18,9)																																	
4	43 (19,7)																																	
5	50 (22,6)																																	
6	59 (26,6)																																	
7	69 (31,2)																																	
8	81 (37,0)																																	
9	89 (40,4)																																	
10	105 (47,5)																																	
11	121 (55,0)																																	
12	120 (54,7)																																	
13	140 (63,3)																																	
14	153 (69,6)																																	
Age group	Load(kg)	54,5 kg																																
Under 36 months	25 ± 0,2 kg	For toys labelled as unsuitable for children of 36 months and over:																																
36 months and over	50 ± 0,5 kg	29,5 kg																																
	For scooter: For toy scooters intended for users up to 50 kg: 54,5 kg For toy scooters intended for users of 20 kg or less: 29,5 kg																																	

6.16.3 Stability of stationary floor toys

The clauses for the stability of stationary floor toys are indicated in [Table 75](#).

Table 75 — Clauses related to stability of stationary floor toys

ISO 8124-1	EN 71-1	ASTM F963
4.15.3 Stability of stationary floor toys See E.29 5.12.6 Stability test of stationary floor toys	4.16 Heavy immobile toys 8.23.2 Heavy immobile toys (see 4.16)	4.15.4 Stability of stationary floor toys

[Table 76](#) illustrates a comparison of stability test for stationary floor toys.

Table 76 — Comparison of stability test for stationary floor toys

	ISO 8124-1	EN 71-1	ASTM F963
Scope	Stationary floor toys greater than 760 mm in height and weighing more than 4,5 kg	Immobile toys with a mass of 4,5 kg or more and intended to rest on the floor but not to bear the mass of a child	Stationary floor toys of greater than 30 in. (760 mm) in height and weighing more than 10 lb (4,5 kg)
Angle of incline	Place the toy on a smooth surface inclined $(10 \pm 1)^\circ$	Place the toy in the most onerous position on a $(5 \pm 1)^\circ$ slope	Placed on a 10° incline
Test duration	Observe whether the toy tips over within 1 min	—	

6.17 Enclosures

6.17.1 General

The clauses for enclosures are indicated in [Table 77](#).

Table 77 — Clauses related to enclosures

ISO 8124-1	EN 71-1	ASTM F963
4.16 Enclosures See E.30 4.16.1 Ventilation	4.14 Enclosures 4.14.1 Toys which a child can enter (see A.18) 4.14.1 a)	4.16 Confined spaces 4.16.1 Ventilation
4.16.2 Closures 4.16.2.1 Lids, doors and similar devices 4.16.2.2 Lid support for toy chests and similar toys 5.13 Test for closures and toy chest lids	4.14.1 b) 4.14.1 c) 8.31 Toy chest lids	4.16.2 Closures 4.41 Toy Chests 4.41.1 Lid Support 4.41.2 Hinge Line Clearance 4.41.3 Closures 8.27 Tests for Toy Chest Lids and Closures
—	—	4.41.5 Toy chests shall comply with the requirements listed in 7.3 for safety labelling and 6.8 for accompanying instructional literature 6.8 Toy Chests 7.3 Toy Chests
4.16.3 Toys that enclose the head	4.14.2 Masks and helmets (see A.19) 4.14.2 a)	4.16.3 Toys that enclose the head

6.17.2 Impermeable material

In ISO 8124-1 and ASTM F963, any toy made of impermeable material and having a door or lid, which encloses a continuous volume greater than $0,03 \text{ m}^3$ and in which all internal dimensions are 150 mm or more, shall provide means for breathing by the incorporation of unobstructed ventilation openings. Compared with ISO 8124-1 and ASTM F963, EN 71-1 does not mention impermeable material in this requirement.

6.17.3 Ventilation

All three referenced standards have similar requirements for toys that enclose the head. The slight differences are shown in [Table 78](#).

Table 78 — Differences in requirements of ventilation

	ISO 8124-1	EN 71-1	ASTM F963
Ventilation requirement	Toys that enclose the head and which are made of impermeable material, shall provide ventilation through at least two holes or through any equivalent single ventilation area	Toys that fully enclose the head and which are made of impermeable material shall provide ventilation through at least two holes or through any equivalent single ventilation area	Toys that enclose the head and which are made of impermeable material shall provide two holes for breathing
Location of ventilation	Ventilation areas should be close to the mouth and nose area	There is no requirement on the location of ventilation area	There is no requirement for equivalent single ventilation area

6.17.4 Closures

- a) In ISO 8124-1 and ASTM F963, closures shall be of a type which can be opened with a force of less than $(45 \pm 1,3)$ N. The force shall be applied in an outward direction to the inside of the closed closure, perpendicular to the plane of the closure and anywhere within 25 mm from the geometric centre of the closure. In EN 71-1, for toys having a door, lid or similar device, it shall be possible to open the door, lid or similar device by applying a force of 50 N or less from the inside.
- b) In ISO 8124-1 and ASTM F963, toy chests shall be accompanied by instructions for proper assembly and maintenance in sufficient detail to describe the correct assembly of components, the resulting hazard if the lid support device is not installed, and a description of how to determine whether or not the support is working properly (see ISO 8124-1:2018, B.3.4 and ASTM F963:2017, 6.8). In EN 71-1, toys chests with vertically opening hinged lids shall be accompanied by instructions for proper assembly and maintenance. The standard does not state specific wording for the instructions.
- c) In ISO 8124-1 and EN 71-1, the requirements on enclosures notably preclude the use of buttons, zips and similar fastenings on doors, lids or similar devices. ASTM F963 has no corresponding requirement. However, in ASTM F963, for any enclosure made of impermeable material, the closure shall be of a type that can be opened with a force of 10 lbf (45 N) or less when tested as follows:

With the closure in a closed position, apply the force in an outward direction to the inside of the closure perpendicular to the plane of the closure and anywhere within 1 in. (25 mm) of the geometric centre of the closure.
- d) In ASTM F963, the requirements on clearances or gaps produced by the action of lid-support mechanisms do not apply to lid support mechanisms installed on the inside of the toy chest that are at least 12 in. (300 mm) from the front and side edges of the toy chest or its lid. ISO 8124-1 and EN 71-1 have no corresponding requirement.

6.17.5 Toy chests safety labelling

In ASTM F963, each toy chest shall be labelled permanently and conspicuously to identify the name and address (city, state, and zip code) of either the manufacturer, distributor or seller. A code mark or other mark shall be provided on the toy chest, and on either the packaging or shipping container, that will identify the date (month and year) of manufacture and permit future identification of any given model. The manufacturer shall change the model number whenever the toy chest undergoes a significant structural design or material modification, or a change that affects its conformity with this consumer safety specification. ISO 8124-1 and EN 71-1 have no corresponding requirement.

6.18 Simulated protective equipment, such as helmets, hats and goggles

The clauses for simulated protective equipment are indicated in [Table 79](#).

Table 79 — Clauses related to simulated protective equipment

ISO 8124-1	EN 71-1	ASTM F963
4.17 Simulated protective equipment, such as helmets, hats and goggles See E.31	4.14.2 Masks and helmets 4.14.2 b) 4.14.2 c)	4.19 Simulated Protective Devices (such as helmets, hats, and goggles)
5.14 Impact test for toys that cover the face	7.8 Imitation protective masks and helmets (see 4.14.2 and A.19)	8.7.4 Impact test for toys that cover the face
B.2.11 Simulated protective equipment		5.9 Simulated protective devices

In EN 71-1, simulated protective equipment made of rigid material shall be subjected to the impact test (1 kg disc, 80 mm in diameter, dropped from a height of 100 mm from the surface of toy). In ISO 8124-1 and ASTM F963, simulated protective equipment that covers the face (including toys with cut-out eye holes as well as items that cover the eyes), such as goggles, space helmets and face shields, shall be subjected to the ball impact test. See [Table 80](#).

Table 80 — Differences between steel ball impact test

	ISO 8124-1	ASTM F963
Diameter	16 ± 0,15 mm	5/8 in (16 mm)
Mass	16,9 ± 0,7 g	0,56 oz. (15,8 g) (with a tolerance of +0,03 oz. (0,8 g), -0 oz.)
Testing height	130 ± 0,5 cm	50 in. (1,3 m)

The mass ranges for the steel ball in ISO 8124-1 and ASTM F963 overlap in the range of 16,2 g to 16,4 g. Therefore, a steel ball with a mass within this range can be used for testing for both referenced standards.

In ISO 8124-1, toys that enclose the head, such as space helmets, which are made of impermeable material(s) shall provide means for breathing by the incorporation of unobstructed ventilation areas close to the mouth and nose area. These ventilation areas shall consist of a minimum of either two holes, each having a total area of at least 650 mm² and placed at least 150 mm apart, or one opening which is equivalent to the two 650 mm² holes expanded to include the separation area.

In EN 71-1, masks and helmets that fully enclose the head and which are made of impermeable material(s) shall provide a total ventilation area of 1 300 mm² or more through at least two holes at least 150 mm apart or through any equivalent single ventilation area.

In ASTM F963, toys that enclose the head, such as space helmets, which are made of impermeable material(s) shall provide means for breathing by the incorporation of unobstructed ventilation areas. The ventilation areas shall consist of a minimum of two holes, with a total of at least 2 in.² (1 300 mm²) of ventilation and at least 6 in. (150 mm) between holes. It does not mention “any equivalent single ventilation area”.

6.19 Projectile toys

6.19.1 General

The clauses for projectile toys are indicated in [Table 81](#).

Table 81 — Clauses related to projectile toys

ISO 8124-1	EN 71-1	ASTM F963
4.18 Projectile toys 4.18.1 General 5.35 Determination of projectile range	4.17 Projectiles 4.17.1 General 8.42 Determination of projectile range	4.21 Projectile toys 8.14.4 Projectile Launch Distance
4.18.2 Projectiles 5.36 Tip assessment of rigid projectiles 5.37 Length of suction cup projectiles 5.24.6.5 Tension test for a projectile with a suction cup B.2.15 Projectile toys	4.17.2 All Projectiles 8.43 Assessment of leading parts of projectiles and flying toys 8.44 Length of suction cup projectiles 8.4.2.4 Tension test for a projectile with a suction cup	4.21.1 All Projectiles 8.14.1 Tip Assessment of Projectiles with a Rigid Leading Edge 8.14.2 Length of Suction Cup Projectiles 8.14.3 Impact Test for Projectiles 8.9.2 Tension Test for Suction Cups on Projectiles
4.18.3 Projectile toys with stored energy 5.15 Kinetic energy and wall impact test 5.15.1 Kinetic energy of projectiles 5.15.2 Wall impact test for projectiles	4.17.3 Projectile toys with stored energy 8.4.2.4 Tension test for a projectile with a suction cup 8.4.2.5 Wall impact test for projectiles (see A.22) 8.24 Kinetic energy of projectiles 7.7 Projectiles	4.21.2 Projectile Toys with Stored Energy 8.14.3 Impact Test for Projectiles 8.14.5 Test Method for Kinetic Energy 8.14.6 Test Method for Kinetic Energy Density (KED) 8.14.7 Improvised Projectiles
4.18.4 Projectile toys without stored energy	4.17.4 Projectile toys without stored energy	4.21.3 Projectile Toys without Stored Energy
4.18.4.1 Mouth-actuated projectile toys 5.20 Durability of mouth-actuated toys	4.11 Mouth-actuated toys and other toys intended to be put in the mouth (See A.15) e)	4.21.3.1 Mouth actuated projectile toys shall comply with the requirements of 4.6.2.2. 4.6.2.2 Projectile toys in which the projectile is launched by the user blowing into the discharge mechanism.
4.18.4.2 Projectiles in the form of a dart 4.18.4.3 Arrows (e.g. bow and arrow set) 5.15.1 Kinetic energy of projectiles	4.17.4.1 darts 4.17.4.2 Bows and arrows 8.24 Kinetic energy of projectiles 8.24.3.4 Determination of kinetic energy per area of contact 7.26 Improvised projectiles	4.21.3.3 Arrows 4.21.3.4 Projectiles in the form of an arrow 8.14.6 Test Method for Kinetic Energy Density (KED)
—	4.17.4.3 Toy catapults and projectiles propelled by an elastic band 7.26 Improvised projectiles	—
—	4.17.4.4 Projectile toys without stored energy where the discharge mechanism can store energy, only when held in place by the user	—

6.19.2 General requirements of projectiles

In ISO 8124-1 and ASTM F963, all projectiles used in projectile toys with stored energy shall not have sharp points, sharp edges or, whatever their orientation, fit entirely into the small parts cylinder. The small part requirement does not apply to projectile toys for children aged 3 years and over with a range of 100 mm or less when measured in accordance with the determination of projectile range.

EN 71-1 does not prohibit stored energy projectiles that are small parts.

6.19.3 Projectile range

All three referenced standards provide test methods for the determination of projectile range and specify three kinds of exemptions.

In ISO 8124-1:2018, the requirements in a) to c) of 4.18.2 (projectiles) and b) to d) of 4.18.3 (projectile toys with stored energy) do not apply to projectiles where the maximum range of the discharged projectile is 300 mm or less.

In EN 71-1:2014+A1:2018, the requirements of 4.17.2.1 (leading parts), 4.17.3 (projectile toys with stored energy) and 4.17.4 (projectile toys without stored energy) do not apply to projectiles that have a maximum range of 300 mm or less.

In ASTM F963:2017, the requirements of 4.21.1.1 (projectiles with rigid leading edges) and 4.21.2.2 to 4.21.2.6 (projectile toys with stored energy) do not apply to projectiles where the maximum range of the discharged projectile is 300 mm or less.

6.19.4 Impact surface

See [Table 82](#) for differences in requirements for projectiles with a suction cup.

Table 82 — Differences in requirements for projectiles with a suction cup

ISO 8124-1	EN 71-1	ASTM F963
<p>(1) Projectiles with a suction cup as a contact surface shall have a length of 57 mm or more before and after being subjected to the torque test and tension test. Foam shaft projectiles with a suction cup that does not pass entirely through test template C, or foam shaft projectiles which are 57 mm or more in the as received state, and where the suction cup has a diameter less than or equal to the diameter of the foam shaft are exempt from the requirements</p> <p>(2) Suction cups on projectiles with a suction cup as a contact surface shall not detach when subjected to the torque test and tension test unless:</p> <p>(a) the detached suction cup does not pass entirely through test template C; and the exposed shaft end complies with the projections requirement; or</p> <p>(b) the suction cup is on a foam projectile where the suction cup diameter is less than or equal to the diameter of the foam shaft</p>	<p>Projectiles with a shaft made entirely of foam and with a suction cup as a leading part where that suction cup has a diameter that is less than or equal to the maximum diameter of the collar or foam shaft, shall:</p> <p>(a) not pass entirely through template E when tested according to small balls test and suction cups, or</p> <p>(b) have a length of 57 mm or more when measured according to length of suction cup projectiles in the as received state; or</p> <p>(c) the suction cup shall not detach when tested in accordance with 8.4.2.4.2 (Tension test for a foam shaft projectile with a suction cup that has a diameter the same as or less than the maximum diameter of the shaft/collar) or shall detach in such a way that the diameter of the suction cup remains less than or equal to the maximum diameter of any remaining collar or foam shaft</p> <p>The projectile shall comply with either a) or both b) and c)</p> <p>Other types of projectile with a suction cup as a leading part shall:</p> <p>(a) not pass entirely through template E when tested according to small balls test and suction cups, or</p> <p>b) have a length of 57 mm or more when measured according to length of suction cup projectiles before and after testing according to torque test and tension test for a non-foam shaft projectile, or</p> <p>c) not detach when tested according to torque test, tension test for a non-foam shaft projectile, impact test, and compression test</p> <p>The projectile shall comply with either a) or both b) and c)</p>	<p>Projectiles with a foam shaft and a suction cup as the leading edge where the suction cup has a diameter that is less than or equal to the diameter of the collar or foam shaft when measured in the as received state shall either:</p> <p>(a) not pass through the test fixture for small balls when subjected only to the force of its own weight; or</p> <p>(b) have a length of 57 mm or more when measured in accordance to length of suction cup projectiles</p> <p>Other types of projectiles with a suction cup as the leading edge shall either:</p> <p>(a) not pass through the test fixture for small balls when subjected only to the force of its own weight; or</p> <p>(b) have a length of 57 mm or more when measured in accordance with length of suction cup projectiles both before and after applying the applicable tests in 8.5 – 8.10 and 8.14.3 and the suction cup shall not detach after applying the applicable tests in 8.5 – 8.10 and 8.14.3</p> <p>This requirement is applicable regardless of whether the projectile can be fired from the discharge mechanism, if any, after applying the applicable tests in 8.5-8.10 and 8.14.3</p>

6.19.5 Discharge mechanism

In all three referenced standards, discharge mechanisms shall be designed so that they are unable to launch improvised projectiles. A set of improvised projectiles with specifications are listed in all three standards. The differences in descriptions and dimensions of the improvised projectiles are shown in [Table 83](#).

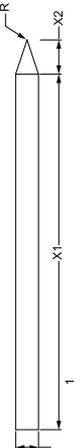
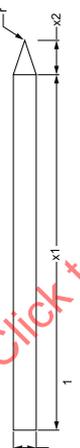
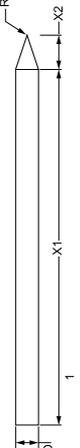
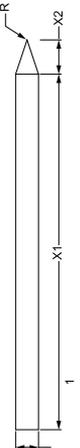
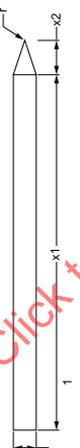
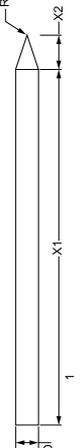
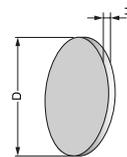
In ISO 8124-1 and ASTM F963, improvised projectiles that travel a distance of 300 mm or less when discharged are not considered to be hazardous. In EN 71-1, the improvised projectile is not considered to be hazardous if the supplied projectile is discharged from the toy with an energy less than or equal to 0,08 J.

STANDARDSISO.COM : Click to view the full PDF of ISO/TR 8124-9:2020

Table 83 — Differences of requirements for description and dimensions of the improvised projectiles

ISO 8124-1											EN 71-1											ASTM F963										
Cylindrical Shafts											Shafts											Shafts										
Designation	Name	Material	D	X1	X2	R	H	Designation	Name	Material	D	X1	X2	R	H	Designation	Name	Material	D	X1	X2	R	H									
A	Pencil	Hardwood	7	155	15	0,5	—	A	Pencil	Hardwood	7	155	15	0,5	—	A	Pencil	Hardwood	7	155	15	0,5	—									
B	Long nail / pen refill	Aluminum	3	100	5	0,1	—	B	Long nail / pen refill	Aluminum	3	100	5	0,1	—	B	Long nail / pen refill	Aluminum	3	100	5	0,1	—									
C	Pen refill	Aluminum	3	50	5	0,1	—	C	Pen refill	Aluminum	3	50	5	0,1	—	—	—	—	—	—	—	—	—	—								
D	Short nail / toothpick	Aluminum	1,5	50	2,3	0,05	—	D	Short nail / toothpick	Aluminum	1,5	50	2,3	0,05	—	C	Short nail / toothpick	Aluminum	1,5	50	2,3	0,05	—									
E	Toothpick	Aluminum	1,5	25	2,3	0,05	—	E	Toothpick	Aluminum	1,5	25	2,3	0,05	—	D	Toothpick	Aluminum	1,5	25	2,3	0,05	—									
Spheres																																
F	Steel ball	Steel	8	—	—	—	—	F	Steel ball	Steel	8	—	—	—	—	E	Steel ball	Steel	8	—	—	—	—									
G	Small marble	Glass	16	—	—	—	—	G	Small marble	Glass	16	—	—	—	—	F	Marble 1	Glass	16	—	—	—	—									
H	Large marble	Glass	25	—	—	—	—	H	Large marble	Glass	25	—	—	—	—	G	Marble 2	Glass	25	—	—	—	—									
Discs																																
I	Small coin	Steel	15	—	—	—	1,5	I	Small coin	Steel	15	—	—	—	1,5	H	Small coin	Steel	15	—	—	—	1,5									
J	Medium coin	Steel	20	—	—	—	2	J	Medium coin	Steel	20	—	—	—	2	I	Medium coin	Steel	20	—	—	—	2									
K	Medium / Large coin	Steel	25	—	—	—	3	K	Medium / Large coin	Steel	25	—	—	—	3	J	Large coin	Steel	25	—	—	—	3									
L	Large Coin	Steel	30	—	—	—	3	L	Large Coin	Steel	30	—	—	—	3	K	X-Large Coin	Steel	30	—	—	—	3									

Table 83 (continued)

ISO 8124-1	EN 71-1	ASTM F963
<p>Radius on shaft tips are non-critical dimensions</p> 	<p>Radii on shaft tips are non-critical dimensions</p> <p>Tolerances:</p> <p>A (pencil), $X1+X2 = \pm 2$ mm</p> <p>B, C, D, E (metal), $X1+X2 = \pm 1$ mm</p> <p>F, G, H (glass marbles) = ± 1 mm</p> <p>I, J, K, L (coins) = $\pm 0,5$ mm diameter and $\pm 0,2$ mm for thickness</p> <p>Shaft A (pencil) diameter = $\pm 0,5$ mm</p> <p>Shafts B, C, D and E (metal), diameters = $\pm 0,2$ mm</p> 	<p>Radius on shaft tips are not critical dimensions and no tolerances are specified</p> <p>Tolerances:</p> <p>Shaft A: $X1$ & $X2 = \pm 2$ mm; $D = \pm 0,5$ mm.</p> <p>Shafts B, C, & D: $X1$ & $X2 = \pm 1$ mm; $D = \pm 0,2$ mm. Spheres E, F & G: $D = \pm 1$ mm</p> <p>Discs H, I, J & K: $D = \pm 0,5$ mm; $H = \pm 0,2$ mm</p> 
		  
<p>—</p>	<p>—</p>	<p>Due to possible dimensional changes caused by heat or humidity, or both, the improvised projectiles should be stored in a controlled environment of 21 ± 1 °C and 65 ± 5 % relative humidity</p>

STANDARDS.PDF.COM Click to view the full PDF of ISO/TR 8124-9:2020

6.19.6 Kinetic energy and warning

In ISO 8124-1 and EN 71-1, projectile toys with stored energy that have projectiles with a kinetic energy greater than 0,08 J shall be accompanied by a warning for use, concerning aiming at the eyes or face, such as: “Warning. Do not aim at eyes or face.”

In ASTM F963, there is no requirement for a warning.

ISO 8124-1 requires that projectile toys without stored energy, that might reasonably be able to be launched at the face, should be accompanied by instructions for use that draw attention to the hazards of aiming at the eyes or face.

In EN 71-1, the potential dangers of using projectiles other than those supplied or recommended by the manufacturer shall be drawn to the attention of the user. The following warning shall be on the toy or its packaging: “**Warning. Do not discharge an object other than the projectile provided with this toy.**”

In ASTM F963, there is no requirement for a warning.

See [Table 84](#) for differences in requirements for kinetic energy and warning.

Table 84 — Differences in requirements for kinetic energy and warning

	ISO 8124-1	EN 71-1	ASTM F963
Projectile toys with stored energy	<p>Projectiles with a kinetic energy greater than 0,08 J when tested according to kinetic energy of projectiles shall:</p> <p>(1) have a contact surface(s) made of a resilient material, and</p> <p>(2) be accompanied by a warning about aiming at the eyes or face, and</p> <p>(3) have a kinetic energy per unit area not greater than 2 500 J/m² when tested according to determination of kinetic energy per area of contact</p>	<p>Projectiles discharged from a projectile toy with stored energy with a kinetic energy greater than 0,08 J when tested according to kinetic energy of projectiles shall:</p> <p>(1) have a leading part(s) made of a resilient material</p> <p>(2) be accompanied by a warning about the potential hazard of aiming at the eyes or face</p> <p>(3) have a kinetic energy per unit area not greater than 2 500 J/m² when tested according to kinetic energy of projectiles</p>	<p>(1) Any projectile that has a kinetic energy that exceeds 0,08 J shall have resilient leading edge(s)</p> <p>(2) Projectiles that have a kinetic energy greater than 0,08 J shall not have a kinetic energy per unit area of contact, also known as Kinetic Energy Density (KED) greater than 2 500 J/m².</p>

Table 84 (continued)

	ISO 8124-1	EN 71-1	ASTM F963
Projectile toys without stored energy	<p>Projectiles in the form of an arrow with a kinetic energy greater than 0,08 J shall have a maximum kinetic energy per unit area of contact not greater than 2 500 J/m² when determined in accordance with determination of kinetic energy</p> <p>Projectile toys without stored energy that might reasonably be able to be launched at the face should be accompanied by instructions for use which draw attention to the hazards of aiming at eyes or face</p>	<p>(1) Arrows fired from a bow with a kinetic energy greater than 0,08 J shall have a maximum kinetic energy per unit area of contact not greater than 2 500 J/m²</p> <p>If any of the improvised projectiles can be launched in a manner determined to be hazardous by a bow capable of firing an arrow, the toy or its packaging shall carry a warning: "Warning. Do not discharge an object other than the projectile provided with this toy."</p> <p>(2) Projectiles launched by toy catapults with projectiles, or an elastic band that is capable of holding a projectile shall meet the requirements of 4.17.3</p> <p>If any of the improvised projectiles can be launched in a manner determined to be hazardous by a toy catapult with projectiles or by an elastic band that is capable of holding a projectile, the toy or its packaging shall carry a warning: "Warning. Do not discharge an object other than the projectile provided with this toy."</p>	<p>Arrows intended to be launched from a bow (that is, bow and arrow set) that have a kinetic energy greater than 0,08 J shall have a maximum kinetic energy per unit area of contact (KED) that does not exceed 2 500 J/m².</p>

6.19.7 Toy catapults and projectiles propelled by an elastic band and projectile toys without stored energy where the discharge mechanism can store energy, only when held in place by the user

EN 71-1 has requirements for toy catapults and projectiles propelled by an elastic band and projectile toys without stored energy where the discharge mechanism can store energy, only when held in place by the user. ISO 8124-1 and ASTM F963 do not have this requirement.

6.19.8 Dart

In ISO 8124-1, the contact area of the dart shall be at least 3 cm² when measured in accordance with the determination of the kinetic energy per area of contact.

In EN 71-1, a dart shall have resilient leading parts, or be provided with a protective cap, cover or tip made of a resilient material, or have a leading part with a contact surface area of at least 2 cm² when measured by direct means and not according to the determination of kinetic energy per area of contact.

In ISO 8124-1, if the protective cap, cover or tip becomes detached from the dart after the torque test and tension test for protective components, and the dart is made of a resilient material, the dart shall continue to have a contact area of at least 3 cm² when measured in accordance with determination of the kinetic energy per area of contact. EN 71-1 does not have a corresponding requirement.

ASTM F963 does not have any corresponding requirements for darts.

6.19.9 Mouth-actuated projectile toys

EN 71-1 and ASTM F963 have a specific durability test method for mouth-actuated projectile toys. In ISO 8124-1, the durability test for mouth-actuated projectile toys is identical to that for mouth-actuated toys.

The differences in durability testing for mouth-actuated projectile toys are shown in [Table 85](#).

Table 85 — Differences in durability test for mouth-actuated projectile toys

	ISO 8124-1	EN 71-1	ASTM F963
Pump	Capable of discharging and receiving more than 300 cm ³ of air in less than 3 s	No requirement	No requirement
Pressure	≤13,8 kPa	13,8 kPa ± 5 %	2 psig ± 5 % (13,8 kPa ± 5 %)
Operation	Subject the toy to 10 alternating blowing and sucking cycles, each within 5 s and of at least (295 ± 10) cm ³ of air including the volume which may be discharged through the relief valve	Apply a pressure of 13,8 kPa ± 5 % in the direction of the mouthpiece for 5 s Carry out the test 10 times in total	Apply a pressure of 13,8 kPa ± 5 % towards the mouthpiece for 5 s Repeat the test for a total of 10 times

6.19.10 Test method

All three referenced standards provide tension test methods for projectiles with suction cups, although the tensile force values are different. See [Table 86](#).

Table 86 — Differences in tension test force for projectiles with suction cups

	ISO 8124-1	EN 71-1	ASTM F963
Tension test force for projectiles with suction cup	(70 ± 2) N	For a non-foam shaft projectile: (a) When the largest accessible dimension of the component to be gripped and tested is 6 mm or less: (50 ± 2) N (b) When the largest accessible dimension of the component to be gripped and tested is greater than 6 mm: (90 ± 2) N For a foam shaft projectile with a suction cup that has a diameter the same as or less than the maximum diameter of the shaft/collar: (60 ± 2) N	0 to 18 months: 10 ± 0,5 lbf (44,5 N) Over 18 to 96 months: 15 ± 0,5 lbf (66,8 N)

All three referenced standards provide wall impact test for projectiles. In ISO 8124-1 and EN 71-1, the distance between the leading edge of the projectile and the impact surface shall be such that the projectile enters free flight. In ASTM F963, the distance is (300 ± 5) mm plus the length of the projectile from the front end of the launcher.

6.20 Rotors and propellers

6.20.1 General

The clauses for rotors and propellers are indicated in [Table 87](#).

Table 87 — Clauses related to rotors and propellers

ISO 8124-1	EN 71-1	ASTM F963
4.19 Rotors and propellers See E.33	4.27 Flying toys 4.27.1 General 4.27.2 Rotors and propellers on flying toys 4.27.3 Rotors and propellers on remote controlled flying toys	4.21.4 Rotors

6.20.2 Scope and exemption

The scope and exemption for rotors and propellers are shown in [Table 88](#).

Table 88 — Comparison of the scope and exemption for rotors and propellers

	ISO 8124-1	EN 71-1	ASTM F963
Scope	Rotors and propellers powered by electrical, spring or inertial energy and that take off into free flight	Flying toys and remote controlled flying toys	Rotors on projectiles intended to rotate in a horizontal plane
Exemption	These requirements do not apply to: <ul style="list-style-type: none"> — rotors and propellers that normally rotate in the vertical plane, e.g. a propeller on an aeroplane or certain remote controlled flying toys, or — rotors and propellers on projectiles that have a maximum range of 300 mm or less when measured in accordance with 5.35 (determination of projectile range) 	Propellers that normally rotate in the vertical plane, e.g. a propeller on an aeroplane Flying toys incorporating rotor blade(s) which are capable of spinning approximately horizontally, each blade being greater than 175 mm in length, measured from the centre of rotation to the blade tip, and with an overall mass of the flying toy greater than 50 g	These requirements do not apply to projectiles that travel 300 mm or less when tested according to 8.14.4 (Projectile Launch Distance)

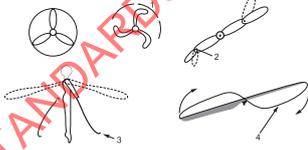
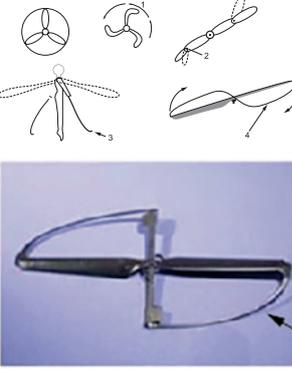
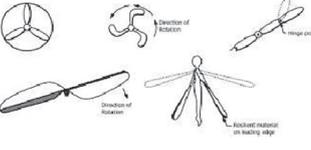
6.20.3 Leading part(s) on rigid parts of flying toys

In EN 71-1, leading part(s) on rigid parts of flying toys shall not protrude beyond the depth of the cylindrical gauge for measurement of leading parts of projectiles. ISO 8124-1 and ASTM F963 do not have this requirement.

6.20.4 Examples of designs to minimize the risk potential of rotating blades

See [Table 89](#).

Table 89 — Comparison of examples for design to minimize the potential of rotating blades

ISO 8124-1	EN 71-1	ASTM F963
a) the design of the rotor or propeller shall prevent access to the blade ends during operation	a) the design of the toy prevents the blade ends contacting the eyes (e.g. a protective ring around the perimeter of the rotor or propeller or by enclosing the rotor or propeller in a cage)	(1) the design of the rotor or propeller prevents access to the blade ends during operation
—	b) the blades are made of flexible material that does not break or permanently deform when tested according to 8.4.2.6 (perpendicular tension test for rotors and propellers)	—
b) the blade ends shall be “clutched” or loosely attached to the rotor so that the ends are not directly powered by the rotor drive	c) the blade ends are “clutched” or loosely coupled to the rotor so that the ends are not directly powered by the rotor drive	(3) the blade ends are “clutched” or loosely attached to the rotor so that the ends are not directly powered by the rotor drive
—	d) a partial ring around the perimeter of the rotor or propeller	—
c) Rotors or propellers shall be designed so that the leading edges are protected with a resilient material	e) rotors or propellers are designed so that the leading part(s) are protected with a resilient material or flexible part	(4) rotors or propellers are designed to have resilient leading edges
—	f) The blades are fully enclosed and not accessible	(2) the rotor blades are curved or swept back
		

6.20.5 Rotor or propeller warning

In EN 71-1, flying toys with rotors or propellers that might reasonably be able to be aimed at the face shall be accompanied by the following warning about the potential hazard of rotors or propellers impacting the eyes or face: **“Warning. Always operate the toy away from eyes or face.”**

EN 71-1 also states that the instructions for use of remote controlled flying toys shall give the user adequate information to use the toy safely:

- a) a reminder that the toy must be used with caution since skill is required in order to control the flight and avoid collisions with the user, objects or third parties;
- b) precautions to be observed such as “Do not touch the rotating rotor, avoid loose clothing or hair that could be caught in the rotor, do not fly near the face”;
- c) advice to adult supervisors to teach children how to safely fly and control the toy;
- d) conditions to be observed when using the toy (e.g. flying room/area needed, indoors or outdoors, no obstacles and persons within flying range to keep the toy in line of sight, maximum operating distance);
- e) advice to keep the instructions for use."

ISO 8124-1 and ASTM F963 do not have these requirements.

6.20.6 Rotors and propellers on remote controlled flying toys

EN 71-1 has requirements for rotors and propellers on remote controlled flying toys. These requirements do not apply to propellers that normally rotate in the vertical plane, for example a propeller on an airplane.

Rotors and propellers on remote controlled flying toys shall conform to the following requirements:

- a) Rotors and propellers shall have one or more of the following features:
 - 1) The design of the toy prevents the blade ends contacting the eyes.
 - 2) The blades shall be made of flexible material that does not break or permanently deform when tested according to 6N perpendicular tension test for rotors and propellers.
 - 3) The blade ends are “clutched” or loosely coupled to the rotor so that the ends are not directly powered by the rotor drive.
 - 4) A protective ring or partial ring around the perimeter of the rotor or propeller.
 - 5) Rotors or propellers are designed so that the leading part(s) are protected with a resilient material or flexible part.
 - 6) The blades are fully enclosed and not accessible.

EXAMPLE Examples of designs that achieve these conditions are given in A.58, Figure A.9.

- b) Rotor edges that may come in contact with the eyeball shall be visibly rounded.
- c) Rotor blades shall not detach when tested according to 90 N tension test for rotors and propellers.

The instructions for use of remote controlled flying toys shall give the user adequate information to use the toy safely.

Rotor blades that are designed to be replaceable shall be accompanied by instructions that clearly indicate the steps necessary to remove and securely replace the rotor blades.

ISO 8124-1 and ASTM F963 do not have these requirements.

6.21 Aquatic toys

The clauses for aquatic toys are indicated in [Table 90](#).

Table 90 — Clauses related to aquatic toys

ISO 8124-1	EN 71-1	ASTM F963
4.20 Aquatic toys See E.34. 4.26 d)	4.18 Aquatic toys and inflatable toys (see A.23)	4.6.2.3 Small objects contained in an inflatable toy
B.2.6 Aquatic toys	7.4 Aquatic toys (see 4.18 and A.23)	5.4 Aquatic toys

- a) In EN 71-1, air-inflation inlets on aquatic toys shall have stoppers, and these stoppers shall not detach from the toy when tested according to 8.3 (torque test) and 8.4.2.1 (tension test, general). In ISO 8124-1, all air inlets of inflatable aquatic toys shall have non-return valves with stoppers permanently attached to the toy. In ISO 8124-1 and EN 71-1, the stopper shall be capable of being pushed into the toy so that it does not protrude more than 5 mm outside the surface of the toy when inflated. ASTM F963 has no corresponding requirement.
- b) In EN 71-1, the stopper shall not detach from the toy when tested according to torque testing and tension testing. In ISO 8124-1 and ASTM F963, stoppers on aquatic toys intended for children under 96 months shall be subjected to reasonably foreseeable abuse tests and shall continue to conform to the relevant requirements toys. The differences are shown in [Table 91](#).

Table 91 — Differences in testing requirements for air-inflation inlets on aquatic toys

	ISO 8124-1	EN 71-1	ASTM F963
0 to 96 months	Reasonably foreseeable abuse	Torque test and tension test	Abuse testing
Over 96 months	—		—

- c) In EN 71-1, stoppers for air-inflation inlets on toys that can be inflated using the mouth shall not, when tested according to torque testing and tension testing, produce any parts which fit entirely in the small parts cylinder.
- d) The differences in warnings for aquatic toys are shown in [Table 92](#).

Table 92 — Differences in warnings for aquatic toys

	ISO 8124-1	EN 71-1	ASTM F963
Content	Aquatic toys should carry a statement that this is not a life-saving device, followed by a warning that the toy should only be used in a shallow water and under supervision	“Warning. Only to be used in water in which the child is within its depth and under adult supervision.”	Warning: This is not a lifesaving device. Do not leave child unattended while device is in use
Location of the warning	—	The warning on the toy shall be visible, indelible and in a colour which contrasts with the body of the toy. The height of letters shall be 3 mm or more and the marking on inflatable aquatic toys shall be 100 mm or less from one of the air inflation inlets	—

6.22 Braking

6.22.1 General

The clauses for braking are indicated in [Table 93](#).

Table 93 — Clauses related to braking

ISO 8124-1	EN 71-1	ASTM F963
4.21 Braking See E.35 5.16 Free-wheeling facility and brake performance test	4.15.1.5 Braking 8.26 Brake performance	—

6.22.2 Braking device — exemptions

There are no specific requirements for braking devices in ASTM F963. ISO 8124-1 and EN 71-1 have different exemptions for braking requirements. See [Table 94](#).

Table 94 — Exemptions from braking requirements

ISO 8124-1	EN 71-1
—	roller skates, inline skates, and toy skateboards
toys where the hands or feet provide the motive power to the driving wheel or wheels via direct transmission (e.g. pedal cars, tricycles)	toys where the hands or feet provide the motive power to the driving wheel(s) via direct transmission
electrically propelled ride-on toys which are propelled at a maximum speed of 1 m/s unloaded, having a seat height of less than 300 mm and in which the feet are free	electrically driven ride-on toys with a maximum design speed of 1 m/s (3,6 km/h) or less, having a seat height below 300 mm and in which the feet are able to effect braking
toy bicycles	tricycles that are provided with a handle that can be used for pushing the child, and that comply with 4.15.1.6 d)

6.22.3 Braking device - requirements

[Table 95](#) illustrates a comparison of scope for toys that utilize a braking device.

Table 95 — Comparison of scope for toys that utilize a braking device

ISO 8124-1	EN 71-1
Mechanically or electrically propelled ride-on toys with a free-wheeling facility in accordance with 5.16.1 (determination of free-wheeling facility) NOTE 1 If a toy accelerates down a slope of 10° when loaded with a mass of 50 kg, it can be expected to be free-wheeling	Mechanically- or electrically-driven ride-on toys with a free-wheeling mechanism shall have a braking device NOTE 2 EN 71-1 gives a definition for free-wheeling mechanism as a transmission in which the drive mechanism is disengaged from the driven shaft when the driven shaft rotates faster than the drive mechanism

6.22.4 Free-wheeling facility

In EN 71-1, the braking requirements do not apply to electrically driven ride-on toys on which the electrical motor itself supplies sufficient braking. The standard specifies two methods to determine motor brake performance: a ramp test (8.26.1.2) and a horizontal test (8.26.1.3). In ISO 8124-1, the horizontal test (5.16.1) is used to determine free-wheeling facility for mechanically or electrically propelled ride-on-toys and for toy bicycles.

6.22.5 Brake performance test

[Table 96](#) illustrates a comparison for brake performance testing.

Table 96 — Comparison for brake performance test

	ISO 8124-1	EN 71-1
Inclined angle	$(10^{+0,5}_0)^\circ$	$(10 \pm 1)^\circ$
Brake performance for certain ride-on toys	<p>Apply a force of (50 ± 2) N in the direction in which the brake handle is normally operated. If the brake is operated by a handle similar to that of a bicycle, apply a force of (30 ± 2) N at right angles to the axis of the handle, at the middle of the handle. If the brake is operated by a pedal, apply a force of (50 ± 2) N to the pedal in the operating direction producing the effect of the brake</p> <p>If the toy has several brakes, test each brake separately</p> <p>The toy shall not move more than 5 cm when tested in accordance with 5.16.2 (brake performance for mechanically or electrically powered ride-on toys other than toy bicycles)</p>	<p>Apply a force of (50 ± 2) N, in the case of levers operated by the hand and arm or by foot, or (30 ± 2) N, in the case of levers operated only by the hand, in the direction in which the brake lever is normally operated. Apply the force to the brake lever 25 mm from the end of the lever</p> <p>If the brake is operated by a pedal, apply the force to the pedal in the operating direction to produce the effect of the brake</p> <p>If the toy has several brakes, test each brake separately</p> <p>The toy shall not move more than 5 cm when tested according to 8.26.1 (brake performance for certain ride-on toys)</p>

6.23 Toy bicycles

6.23.1 General

The clauses for toy bicycles are indicated in [Table 97](#).

Table 97 — Clauses related to toy bicycles

ISO 8124-1	EN 71-1	ASTM F963
4.22 Toy bicycles See 4.13.3 and E.36 4.22.1 Instructions for use B.2.17 Toy bicycles	4.15.2 Toy bicycles (see A.20) 4.15.2.1 General 4.15.2.2 Warnings and instructions for use 7.15 Toy bicycles (see 4.15.2.2) 7.16 Toys intended to bear the mass of a child (see 4.15.1.2, 4.15.2.2, 4.15.3 and 4.15.4)	—
4.22.2 Determination of maximum saddle height	4.15.1.7 Adjustable seat pillar and handlebar stem minimum insertion marks	—
4.22.3 Braking requirements 5.16.1 Determination of free-wheeling facility 5.16.3 Brake performance for toy bicycles	4.15.2.3 Braking requirements 8.26.2 Brake performance for toy bicycles (see 4.15.2.3)	—

NOTE 1 For US requirements, toy bicycles are covered by 16 CFR 1512.

NOTE 2 For information: CEN TC 52 is presently discussing a revision to the braking requirements for toy bicycles and also to include requirements for balance bikes.

6.23.2 Braking system

EN 71-1 requires two braking systems on toy bicycles and ISO 8214-1 requires one braking system.

6.23.3 Warning

In EN 71-1, toy bicycles and their packaging shall carry the warning: "Warning. Protective equipment should be worn. Not to be used in traffic." ISO 8124-1 does not list specific wording for the toy bicycles warning statement.

6.24 Speed limitation of electrically driven ride-on toys

6.24.1 General

The clauses for speed limitation of electrically driven ride-on toys are indicated in [Table 98](#).

Table 98 — Clauses related to speed limitation of electrically driven ride-on toys

ISO 8124-1	EN 71-1	ASTM F963
4.23 Speed limitation of electrically driven ride-on toys See E.37 5.17 Determination of speed of electrically driven ride-on toys	4.15.1.2 Warnings and instructions for use 4.15.1.8 Electrically-driven ride-on toys 5.6 Speed limitation of electrically-driven ride-on toys 7.10.3 Electrically -driven ride-on toys 8.29 Determination of maximum design speed of electrically-driven ride-on toys (see 4.15.1.2, 4.15.1.5, 4.15.1.8 and 5.6)	—

6.24.2 Seat requirements

In EN 71-1, electrical ride-on toys intended for use by children less than 6 years old shall be equipped with a seat. There is no corresponding requirement in ISO 8124-1 and ASTM F963.

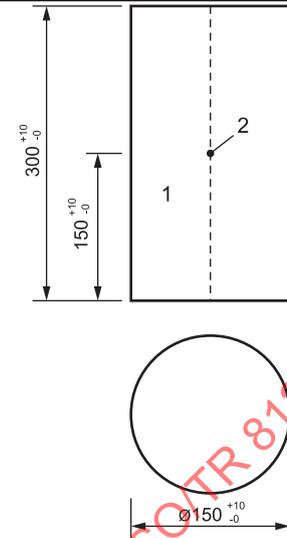
6.24.3 Determination of maximum design speed of electrically driven ride-on toys

See [Table 99](#) for an abbreviated comparison of the test to determine the maximum design speed of electrical ride-on toys.

Table 99 — Comparison of the test to determine the maximum design speed of electrically driven ride-on toys

	ISO 8124-1	EN 71-1
Load mass	(25 ± 0,2) kg	Under 36 months: (25 ± 0,2) kg; Over 36 months: (50 ± 0,5) kg

Table 99 (continued)

	ISO 8124-1	EN 71-1
Dimension specification of load	—	
Load placement	Toy normal sitting or standing position	a) Toy sitting or standing position b) If the toy is intended to bear the mass of more than one child at a time, place the mass on the driver's sitting or standing surface
Test plane	Horizontal surface	Horizontal plane with a surface that prevents skidding of the wheels (e.g. abrasive paper, asphalt or similar)
Test procedure	—	The toy is set at the maximum speed setting. If the toy is equipped with a two-position device with which the maximum design speed can be changed, the speed shall be determined with the device in the low-speed position and in the high-speed position Determine the average speed with an accuracy of $\pm 10\%$ Carry out the test 3 times and determine the maximum value. The maximum value is the maximum design speed
Requirement on speed limitation	Electrically driven ride-on toys shall have a maximum speed of 8 km/h	Toys intended for children under 3 years: 6 km/h Toys intended for children over 3 years, but under 6 years: 6 km/h or 8,2 km/h. The higher speed (8,2 km/h) is applicable only if the toy is equipped with a two-position device which limits the maximum design speed to 6 km/h or less in one position Toys intended for children of 6 years and over: 16 km/h
Warning	—	"Warning. Protective equipment should be worn. Not to be used in traffic." An additional warning related to the age group for which the toy is intended, with regard to the limitations specified, is also required: "Warning. This toy is unsuitable for children under 3 years due to its maximum speed." or "Warning. This toy is unsuitable for children under 6 years due to its maximum speed."

6.25 Toys containing a heat source

6.25.1 General

The clauses for toys containing a heat source are indicated in [Table 100](#).

Table 100 — Clauses related to toys containing a heat source

ISO 8124-1	EN 71-1	ASTM F963
4.24 Toys containing a heat source	4.21 Toys containing a non-electrical heat source	—
5.18 Determination of temperature increases	8.30 Measurement of temperature rises (see 4.21)	

6.25.2 Exemption for toys containing a heat source

The exemptions in ISO 8124-1 and EN 71-1 are not identical (see [Table 101](#)). Light bulbs are specifically exempted from ISO 8124-1. However, EN 71-1 has the statement: “requirements for toys containing an electrical heat source are given in EN 62115”, therefore electrical light bulbs are also exempted from the heat source requirements in EN 71-1.

Table 101 — Exemptions for toys containing a heat source

ISO 8124-1	EN 71-1	ASTM F963
Burners in chemistry sets or related experimental kits, or light bulbs and similar items	Burners and similar items in chemistry sets and experimental kits and similar items	—

6.25.3 Scope of toys containing a heat source

In ISO 8124-1, the scope of the requirements covers all toys containing a heat source. In EN 71-1, the scope of the requirements covers only toys containing non-electric heat source. EN 71-1 has the statement: “requirements for toys containing an electrical heat source are given EN 62115”. ASTM F963 does not mention toys containing non-electrical heat source.

NOTE For US requirements, electrically operated toys containing a heat source are covered by 16 CFR 1505.

6.25.4 Temperature rise for heat sources

The requirements between ISO 8124-1 and EN 71-1 are almost the same except that EN 71-1 specifies one more material category (“glass or porcelain”) for the temperature rise limits of other accessible parts of the toy. Refer to [Table 102](#) for details.

Table 102 — Requirements for toys containing a heat source

ISO 8124-1 (Toys containing a heat source)		EN 71-1 (Toys containing a non-electrical heat source)	
The temperature rise of all handles, knobs and similar parts which are likely to be touched by hand shall not exceed the following values			
Parts made of metal	25 K	Parts made of metal	25 K
Parts made of glass or porcelain	30 K	Parts made of glass or porcelain	30 K
Parts made of plastics or wood	35 K	Parts made of plastics or wood	35 K
The temperature rise of other accessible parts of the toy shall not exceed the following values			
Parts made of metal	45 K	Parts made of metal	45 K

Table 102 (continued)

ISO 8124-1 (Toys containing a heat source)		EN 71-1 (Toys containing a non-electrical heat source)	
Parts made of other materials	55 K	Parts made of other materials	55 K

6.25.5 Test environment for toys containing a heat source

There is a minor difference in the test methods of ISO 8124-1 and EN 71-1, indicated in [Table 103](#).

Table 103 — Comparison of test environment for toys containing a heat source

	ISO 8124-1	EN 71-1
Test environment	In an ambient draft-free atmosphere with a temperature of (21 ± 5) °C	In an ambient temperature of (20 ± 5) °C

6.26 Liquid-filled toys

The clauses for liquid-filled toys are indicated in [Table 104](#).

Table 104 — Clauses related to liquid-filled toys

ISO 8124-1	EN 71-1	ASTM F963
4.25 Liquid-filled toys See E.38	5.5 Liquid-filled toys (see A.30)	4.3.6 Cosmetics, liquids, pastes, putties, gels, Powders, and Items of Avian Feather Origin
5.19 Leakage of liquid-filled toys	8.15 Leakage of liquid-filled toys (see 5.5 and A.42)	NOTE This requirement is related to toxicology
B.3.5 Liquid-filled teethers and liquid-filled teething toys	7.12 Liquid-filled teethers (see 5.5)	

- a) In ISO 8124-1 there shall be no leakage of the contents of liquid-filled toys that contain an inaccessible liquid which could result in a potential hazard before and after the test. If the liquid-filled toy leaks, the contents should be assessed for any potential hazard. In EN 71-1, there shall be no leakage of the contents nor any splitting or cracking of toys that contain inaccessible liquid, which could lead to leakage of the contents before and after the test. Both standards carry a warning for liquid-filled toys not to be placed in a freezer compartment. ASTM F963 contains no leakage test for liquid-filled toys.
- b) Only ISO 8124-1:2018, E.38 considers that the liquid is either aqueous or non-aqueous.

6.27 Mouth-actuated toys

The clauses for mouth-actuated toys are indicated in [Table 105](#).

Table 105 — Clauses related to mouth-actuated toys

ISO 8124-1	EN 71-1	ASTM F963
4.26 Mouth-actuated toys See E.39	4.11 Mouth-actuated toys and other toys intended to be put in the mouth (see A.15)	4.6.2 Mouth-actuated toys
5.20 Durability of mouth-actuated toys	8.9 Soaking test (see 4.11, 4.23.2, 5.1, 5.10 and 5.12)	8.13 Test methods for mouth-actuated toys and mouth-actuated projectile toys
	8.17 Durability of mouth-actuated toys (see 4.11 and A.44)	

- a) EN 71-1 has been extended to address any removable or detachable component of mouth actuated toys and of toys intended to be put in the mouth. ISO 8124-1:2018, 4.26 applies to the mouthpiece and to loose objects of mouth actuated toys and mouthpieces fitted to balloons. ASTM F963:2017, 4.6.2 applies to mouth actuated toys containing loose objects.
- b) EN 71-1 clarifies that stoppers for air-inflation inlets on toys which can be inflated using the mouth are excluded from the requirement of mouth actuated toys and other toys intended to be put in the mouth, but are applicable to the requirements listed in EN 71-1:2014+A1:2018, 4.18.
- c) All three referenced standards include a durability test for the mouthpiece of mouth actuated toys. ASTM F963 also requires the durability test to be performed on the air outlet which is capable of being inserted into or covered by the mouth. ISO 8124-1 and EN 71-1 require the durability test to be performed on the air outlet, if the air outlet is accessible.
- d) Only EN 71-1 requires that mouth actuated toys be subjected to the soak test.
- e) In ISO 8124-1, non-detachable mouthpieces of mouth-actuated toys, if detached when tested in accordance with torque test tension test, shall not be small parts. In EN 71-1, mouthpieces and other components of toys intended to be put in the mouth, excluding mouth-actuated projectile toys, if detached, when tested first according to soaking test and then according to the torque test and the tension test, shall not be small parts. In ASTM F963:2017, only for mouth-actuated projectile toys, the mouthpieces intended to be user-removable shall not be small parts. If a permanently attached mouthpiece detaches from the discharge mechanism when subjected to applicable sections of 8.7.1, 8.8, 8.9 and 8.10, it shall not be a small part.

6.28 Toy roller skates, toy inline skates and toy skateboards

The clauses for toy roller skates, toy inline skates and toy skateboards are indicated in [Table 106](#).

Table 106 — Clauses related to toy roller skates, toy inline skates and toy skateboards

ISO 8124-1	EN 71-1	ASTM F963
4.27 Toy roller skates, toy inline skates and toy skateboards	4.15.1.2 Warnings and instructions for use	—
B.2.14 Toy roller skates, toy inline skates and toy skateboards	7.10 Roller skates, inline skates, skateboards and certain other ride-on toys (see 4.15.1.2 and A.20)	
	7.16 Toys intended to bear the mass of a child (see 4.15.1.2, 4.15.2.2, 4.15.3 and 4.15.4)	

ISO 8124-1 and EN 71-1 require toy roller skates, toy inline skates and toy skateboards intended for use by children weighing no more than 20 kg to carry a warning. In addition to the requirements mentioned above, EN 71-1 also requires a warning on such toys and their packaging due to their construction, strength, design or other factors, where they are not suitable for use by children of 36 months and over.

6.29 Percussion caps

The clauses for percussion caps are indicated in [Table 107](#).

Table 107 — Clauses related to percussion caps

ISO 8124-1	EN 71-1	ASTM F963
4.28 Percussion caps specifically designed for use in toys See E.40 B.2.18 Percussion caps	4.19 Percussion caps specifically designed for use in toys and toys using percussion caps (see A.24) 7.13 Percussion caps specifically designed for use in toys (see 4.19)	5.12 Toy caps

ISO 8124-1 and EN 71-1 both require that percussion caps specifically designed for use in toys shall not produce flames, glowing parts or other debris which are potential eye injury hazards. See [Table 108](#).

Table 108 — Differences in warnings for toy caps / percussion caps

ISO 8124-1	EN 71-1	ASTM F963
The packaging of percussion caps shall carry a warning to not be used indoors or near eyes and ears and to not be carried loose in a pocket	“Warning. Do not fire indoors or near eyes and ears. Do not carry caps loose in a pocket.”	Warning as specified in 16 CFR 1500.86 Warning as specified in 16 CFR 1500.86
“Warning! Do not use close to the ear! Misuse may cause damage to hearing.”	“Warning. Do not use close to the ear! Misuse may cause damage to hearing.”	
The packaging of percussion caps shall carry a warning to not be used indoors or near eyes and ears and to not be carried loose in a pocket	“Warning. Do not fire indoors or near eyes and ears. Do not carry caps loose in a pocket.”	

6.30 Acoustic requirements

6.30.1 General

The clauses for acoustics are indicated in [Table 109](#).

Table 109 — Clauses related to acoustics

ISO 8124-1	EN 71-1	ASTM F963
4.29 Acoustic requirements See E.42 B.2.19 Toys which produce high peak sound pressure levels 5.25 Determination of sound pressure levels	4.20 Acoustics (see A.25) 8.28 Determination of emission sound pressure levels (see 4.20) 7.14 Acoustics (see 4.19 and 4.20)	4.5 Sound-producing toys 8.19 Tests for toys which produce noise

6.30.2 Scope for the acoustic

The scope in ISO 8124-1 and ASTM F963 are the same, but EN 71-1 is significantly different. In EN 71-1, toys that are clearly designed to emit sound, but do not belong to the 11 categories of toys as illustrated in [Table 110](#), shall be assessed as either table-top, floor or handheld toys, whichever is the most appropriate. The acoustic requirements of EN 71-1 apply to all toys that are clearly designed to emit sound including those where the sound pressure level is determined by user’s strength or external media. However, these specific types of acoustic toys that rely on the muscular action of the user (excluding rattles) are not excluded from the requirement of ASTM F963 and ISO 8124-1.

6.30.3 Category of acoustic toys

EN 71-1 classifies toys designed to emit sound into three exposure categories. The requirements of A-weighted time averaged emission sound pressure level L_{pA} varies according to the exposure category, as well as to the different toy categories. For toys that do not fit clearly into a specific exposure category, the nearest, strictest exposure category should be used. In ISO 8124-1 and ASTM F963, for the requirements of A-weighted equivalent sound pressure level (L_{Aeq} or L_{pAeq}) of continuous sounds, the limits are determined by the toy categories and are not determined by the length of time or proportion of the play pattern relating to the sound.

6.30.4 Rattles

In ISO 8124-1 and ASTM F963, rattle toys only need to be tested to the peak sound pressure level L_{pCpeak} or L_{Cpeak} , respectively. EN 71-1 applies both L_{pA} and L_{Cpeak} measurements on rattle toys.

6.30.5 Comparison of the acoustic requirements

See [Table 110](#) for an abbreviated comparison of the requirements for acoustics between EN 71-1, ASTM F963 and ISO 8124-1.

Table 110 — Comparison of the acoustic requirements

Unit: dB

Toy categories	dB			dB			dB		
	ISO L_{pAeq}	ASTM L_{Aeq}	EN L_{pA}	ISO L_{pCpeak}	ASTM L_{Cpeak}	EN L_{pCpeak}	ISO L_{pAFmax}	ASTM L_{AFmax}	EN L_{AFmax}
Close-to-the-ear toys	65	65	60/65/70 ^a	110	110	110	—	—	—
Cap-firing toys ^c	—	—	90	125 ^b	125	125 ^c	—	—	—
Rattles	—	—	85	115	115	110	—	—	—
Hand-held toys	85	85	80/85/90 ^a	115	115	110	—	—	—
Table-top or floor toys	85	85	80/85/90 ^a	115	115	110	—	—	—
Pull-along or push toys	—	—	—	115	115	110	85	85	80/85/90 ^b
Toys using head-phones or earphones	—	—	85	—	—	135	—	—	—
Squeeze toys	—	—	85	—	—	110	—	—	—
Percussion toys ^c	—	—	85	—	—	130	—	—	—
Wind toys	—	—	85/90 ^d	—	—	110	—	—	—
Voice toys	—	—	80/85/90 ^a	—	—	110	—	—	—

^a The requirements are for exposure category 1, 2 and 3, respectively.
^b L_{pCpeak} produced by cap-firing toys or explosion toys shall not exceed 125 dB. If it exceeds 115 dB, the potential danger to hearing shall be drawn to the attention of the user by a warning.
^c Percussion toys and cap-firing toys which produce high impulse sound levels, or their packing, shall carry the warning.
^d The requirements are for exposure category 2 and 3, respectively.

6.30.6 Test method

[Table 111](#) illustrates differences between the standards in the microphone distances, number of microphones, the measurement distance, microphone position, number of operators and other test parameters.

Table 111 — Differences between the microphone distances, number of microphones, number of operators and other test parameters

Toy type	Measurement parameter		
	ISO 8124-1	EN 71-1	ASTM F963
Close-to-the-ear toys	a) Measure distance ^b : (50 ± 1) cm b) Microphone position: 1	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 6	a) Measure distance ^b : (50 ± 1) cm b) Microphone position: 1
Table-top or floor toys	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 5 (9 when the toy is larger than 100 cm)	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 5 (9 when the toy is larger than 100 cm)	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 5 (9 when the toy is larger than 100 cm)
Hand-held toys	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 6	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 6	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 6
Pull-along or push toys	a) Measure distance ^b : (40 + w/2) cm ^a b) Microphone positions: 2 c) Speed: 1 m/s or less	a) Measure distance ^b : (40 + w/2) cm ^a b) Microphone positions: 2 c) Speed: 1 m/s or less	a) Measure distance ^b : (40 + w/2) cm ^a b) Microphone positions: 2 c) Speed: 1 m/s or less
Cap-firing toys	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 6	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 6	a) Measure distance ^b : (50 ± 1) cm b) Microphone positions: 6
Rattles	a) Measure distance ^b : 50 cm b) Microphone position: 1 c) Microphone Mounting: above the ground 100 cm d) Operator: 1 adult	a) Measure distance ^b : (50 ± 1) cm b) Microphone position: 1 c) Microphone Mounting: at least 100 cm above the floor d) Operator: 3 adults	a) Measure distance ^b : 50 cm b) Microphone position: 1 c) Microphone Mounting: above the ground 100 cm d) Operator: 1 adult
Squeeze toys	—	a) Measure distance ^b : (50 ± 1) cm b) Microphone position: 1 c) Operator: 3 adults	—
Percussion toys	—	a) Measure distance ^b : 50 cm b) Microphone positions: For hand-held toys 6, For table-top or floor toys 5 c) Operator: 3 adults	—
Wind toys	—	a) Measure distance ^b : 50 cm b) Microphone positions: 5 c) Operator: 3 adults	—
Voice toys	—	a) Measure distance ^b : 50 cm b) Microphone positions: For hand-held toys 6, For table-top or floor toys 5	—
Toys using headphones or earphones	—	Measure in an ear simulator	—

^a W is the width of toy.
^b Measure distance is from the reference box to the microphone, not from the product to the microphone.

Compared to ISO 8124-1 and ASTM F963, EN 71-1 adds five kinds of toys into the scope, such as squeeze toys, percussion toys, wind toys, toys with headphones and voice toys. There are an additional five test methods in EN 71-1 for these toy categories. Some kinds of toys require adult operation during noise level measurement, such as squeeze toys, rattle toys, percussion toys and wind toys. EN 71-1 requires at least three adult operators to operate the toy during testing. For A-weighted time-averaged sound pressure level, the operators are required to apply the maximum force and operating frequency which obtain the maximum noise level when conducting a test. Noise levels obtained in this way will be louder or have a higher decibel level than normal use, so the measured value should be reduced by a stated value before comparing it with the limit value. For C-weighted peak sound pressure level, since the sound pressure level is independent of time, operators are required to apply the greatest effort to operate the toy. The test result is considered the worst-case scenario.

Both ISO 8124-1 and ASTM F963 state that the axis of the free-field response microphone pre-amplifier body should be oriented towards the dominant sound source, while EN 71-1 requires the test environment to meet the qualification requirements of EN ISO 11201 or EN ISO 11202.

6.31 Toy scooters

6.31.1 General

The clauses for toy scooters are indicated in [Table 112](#).

Table 112 — Clauses related to toy scooters

ISO 8124-1	EN 71-1	ASTM F963
4.30 Toy scooters See E.44 4.30.1 General	4.15.5 Toy scooters (see A.49) 4.15.5.1 General	—
4.30.2 Warnings and instructions for use B.2.20 Toy scooters	4.15.5.2 Warnings and instructions for use 4.18 Toy scooters (see 4.15.5.2)	—
4.30.3 Strength 5.26 Static strength for toy scooters 5.27 Dynamic strength for toy scooters 5.29 Strength of toy scooter steering tubes	4.15.5.3 Strength 4.15.1.3 Strength 8.21 Static strength (see 4.15.1.3, 4.15.1.5, 4.15.3, 4.15.4 and A.46) 8.22 Dynamic strength (see 4.15.1.3) 8.27 Strength of toy scooter steering tubes (see 4.15.5.3)	—
4.30.4 Stability 5.12.2 Sideways stability test, feet available for stabilization	4.15.1.4 Stability	—
4.30.5 Adjustable and folding steering tubes and handlebars 5.30 Resistance to separation of handlebar	4.15.5.4 Adjustable and folding steering tubes	—
4.30.6 Braking 5.28 Brake performance for toy scooters	4.15.5.5 Braking 8.26.3 Brake performance for toy scooters (see 4.15.5.5)	—
4.30.7 Wheel size	4.15.5.6 Wheel size	—

Table 112 (continued)

ISO 8124-1	EN 71-1	ASTM F963
4.30.8 Projections See E.13	4.15.5.7 Protruding parts	—

NOTE For the USA, ASTM F2264 provides the test requirements for non-powered scooters and covers non-powered scooters intended for children of ages 5 years and older. In ASTM F963:2017, the requirements in 4.15 also apply to non-powered scooters intended for children of less than 5 years.

6.31.2 Comparison of toy scooter requirements

[Table 113](#) lists the comparison of toy scooter requirements between EN 71-1 and ISO 8124-1.

Table 113 — Comparison of toy scooters

	ISO 8124-1	EN 71-1
General	✓	Same as ISO 8124-1
Warnings and instructions for use	✓	Same as ISO 8124-1
Strength	✓	Substantially similar to ISO 8124-1, however EN 71-1 further clarifies the orientation of steering during the loading test: 1) For toy scooters with straight steering tubes place the toy scooter so that the steering tube is perpendicular to the horizontal plane during the test 2) For toy scooters with non-straight steering tubes, or in cases where the scooter cannot be oriented as above, place and secure the toy scooter so that the vertical line(s) is through the wheel axle and the point(s) where the mass(es) shall be suspended, is perpendicular to the horizontal plane during the test
Stability	✓	Same as ISO 8124-1
Adjustable and folding steering tubes	✓	Same as ISO 8124-1
Handlebars	✓	Substantially similar to ISO 8124-1, however EN 71-1 does not have the requirement for separation resistance of the handlebar
Braking	✓	Same as ISO 8124-1
Wheel size	✓	Same as ISO 8124-1
Projections	✓	Same as ISO 8124-1

6.32 Magnets and magnetic components

The clauses for magnets and magnetic components are indicated in [Table 114](#).

Table 114 — Clauses related to magnets and magnetic components

ISO 8124-1	EN 71-1	ASTM F963
4.31 Magnets and magnetic components See E.45	4.23 Magnets (see A.51) 4.23.1 General	4.38 Magnets
4.31.1 Magnetic/electrical experimental sets intended for children 8 years and over B.2.21 Magnetic/electrical experimental sets for children 8 years and over 5.32 Magnetic flux index	4.23.3 Magnetic/electrical experimental sets intended for children over 8 years 8.35 Magnetic flux index (see 4.23.2 and 4.23.3)	4.38.1 4.38.2 8.25 Magnet test methods 8.25.1 Flux density measurement 8.25.2 Area measurement of the pole surface 8.25.3 Calculation 8.25.4 Magnet use and abuse testing
4.31.2 All other toys with magnets and magnetic components 5.31 Tension test for magnets 5.32 Magnetic flux index 5.33 Impact test for magnets 5.34 Soaking test for magnets	4.23.2 Toys other than magnetic/electrical experimental sets intended for children over 8 years 8.34 Tension test for magnets (see 4.23.2 and A.51) 8.35 Magnetic flux index (see 4.23.2 and 4.23.3) 8.9 Soaking test (see 4.11, 4.23.2, 5.1, 5.10 and 5.12)	4.38.3 5.17 Magnets

The requirements for magnets and magnetic components are similar in the three referenced standards, but there are variances between the test methods applied.

- a) In EN 71-1, wooden toys, toys intended to be used in water, and mouth-actuated toys shall be subjected to a soaking test prior to other testing. In ISO 8124-1 and ASTM F963, only wooden toys, toys intended to be used in water and mouth pieces of mouth-actuated toys with magnets or magnetic components shall be subjected to a soaking test. See [Table 115](#) for the differences in the water temperature for the soaking test.

Table 115 — Differences in temperature of water for soaking test

	ISO 8124-1	EN 71-1	ASTM F963
Water temperature	(21 ± 5) °C	(20 ± 5) °C	(21 ± 5,0) °C

- b) Differences between the gauss meter specifications are shown in [Table 116](#).

Table 116 — Differences between the gauss meter specifications

	ISO 8124-1	EN 71-1	ASTM F963
Resolution	5 G	5 G	5 gauss (G)
Accuracy	1,5 % or better	1,5 % or better	—
Active area diameter	(0,76 ± 0,13) mm	(0,76 ± 0,13) mm	(0,76 ± 0,13) mm
Distance between the active area and probe tip	(0,38 ± 0,13) mm	(0,38 ± 0,13) mm	(0,38 ± 0,13) mm
Probe type	Axial type probe	Axial type probe	Axial type probe

c) The comparisons of the test procedure are shown in [Table 117](#).

Table 117 — Comparisons of the test procedure for magnets and magnetic components

ISO 8124-1	EN 71-1	ASTM F963
5.34 Soaking test for magnets (for wooden toys, toys intended to be used in water and mouth pieces of mouth-actuated toys with magnets or magnetic components)	8.9 soaking test (wooden toys, toys intended to be used in water, and mouth-actuated toys)	8.25.4.1 Soaking Test for Magnets (for wooden toys, toys intended to be used in water, and mouth pieces of mouth-actuated toys with magnets or magnetic component(s))
5.31 tension test for magnets	8.3 torque test 8.4.2.1 tension test, general 8.4.2.2 tension test, seams and materials	8.25.4.2 Cycling as Received
5.24.2 drop test or, if applicable 5.24.3 tip over test for large and bulky toys	8.5 drop test or 8.6 tip over test (for large and bulky toys)	8.25.4.3 Drop Test
5.24.5 torque test 5.24.6.1 tension test, general procedure 5.24.6.2 tension test for seams in soft-filled (stuffed) toys, beanbag-type toys and other similar filled toys	—	8.25.4.4 Torque Test 8.25.4.5 Tension Test
5.33 Impact test for magnets	8.7 impact test	8.25.4.6 Impact Test
5.24.7 compression test (for magnets that are accessible but cannot be grasped)	8.8 compression test	8.25.4.7 Compression Test (for magnets that are accessible but cannot be grasped)
5.31 tension test for magnets	8.34 tension test for magnets (for magnets that are accessible but not grippable)	8.25.4.8 Cycling

d) The tension test for magnets in all three standards is mainly for simulating the intended and reasonably foreseeable play pattern. The tension test for magnets is specified differently and the differences are indicated in [Table 118](#).

Table 118 — Differences for tension test for magnets

	ISO 8124-1	EN 71-1	ASTM F963
Scope	All unique magnetic component(s)	Magnets that are accessible but not grippable	Toys that contain a single magnet or a combination of magnets, magnetic components, or metal mating parts, or combinations thereof

Table 118 (continued)

	ISO 8124-1	EN 71-1	ASTM F963
Toys that contain more than one magnet or magnetic component	Without damaging the toy, place the magnet or magnetic component in the orientation of attraction, as close as possible, making contact if possible, to the magnet to be tested. Gradually apply a pulling force to the magnet/magnetic component until it separates from the magnet under test Perform the test 10 times or until the magnet under test is detached from the toy, whichever occurs first	Without damaging the toy, place the magnet or magnetic component as close as possible to the magnet to be tested. Gradually apply a pulling force to the magnet/magnetic component until it separates from the tested magnet or until the magnet is detached from the toy Perform the test 10 times	Without damaging the toy, the magnetic parts shall be brought together to a distance that initiates magnetic attraction, released, and then pulled apart to the distance where magnetic attraction ceases. Each attachment and detachment shall count as one cycle. Perform the test one thousand (1 000) cycles or until the magnet under test detaches from the toy, whichever occurs first. It is acceptable for the testing to be automated or to be performed manually
Toys that contain one magnet only and a mating metal component	Without damaging the toy, place the metal components as close as possible, making contact if possible, to the magnet to be tested. Gradually apply a pulling force to the metal component until it separates from the magnet under test. Perform the test 10 times or until the magnet under test is detached from the toy, whichever occurs first	Without damaging the toy, place the flat part of the nickel disc (diameter $30 \pm 0,5$ mm; length $10 \pm 0,5$ mm) as close as possible to the magnet to be tested. Gradually apply a pulling force to the disc until it separates from the magnet or until the magnet is detached from the toy. Perform the test 10 times	If no other magnets or magnetic parts are provided with the toy, then the mating metal part or surface, according to the toy's intended play pattern, should be used for cycling purposes Perform the test one thousand (1 000) cycles or until the magnet under test detaches from the toy, whichever occurs first
Toys that contain one magnet only and no mating metal component	Without damaging the toy, place the flat part of the nickel disc (diameter $30 \pm 0,5$ mm; length $10 \pm 0,5$ mm) as close as possible to the magnet to be tested, making contact if possible. Gradually apply a pulling force to the disc until it separates from the magnet under test. Perform the test 10 times or until the magnet under test is detached from the toy, whichever occurs first		If no other metal parts or surfaces are provided with the toy, the following shall be used for cycling purposes: A nickel disk with a minimum nickel content of 99 % and having the following dimensions: Diameter: $30 \pm 0,5$ mm Thickness: $10 \pm 0,5$ mm Perform the test one thousand (1 000) cycles or until the magnet under test detaches from the toy, whichever occurs first

6.33 Yo-yo balls

The clauses for yo-yo balls are indicated in [Table 119](#).

Table 119 — Clauses related to yo-yo balls

ISO 8124-1	EN 71-1	ASTM F963
3.81 Yo-yo ball	3.71 Yo-yo ball	3.1.95 Yo yo elastic tether toy
4.32 Yo-yo balls	4.24 Yo-yo balls (See A.52)	4.37 Yo Yo elastic tether toys
5.38 Yo-yo ball measurement	8.37 Yo-yo balls measurements (See 4.24)	8.24 Yo Yo elastic tether toy test methods

ISO 8124-1 and EN 71-1 have the same requirements. ASTM F963, is different in terms of both requirements and test methods.

In ISO 8124-1 and EN 71-1, the initial length of the yo-yo ball tether shall not be greater than 370 mm when measured under a force of (50 ± 1) g. The ratio of the mass m (in grams) to the elastic constant k of the yo-yo ball shall be less than 2,2 when measured as described. The test parameters are intended to ensure that the total length of the cord of the yo-yo ball during use will be less than 750 mm.

In ASTM F963, toys with an end mass greater than 0,02 kg (0,044 lb) shall have a tether length less than 50 cm (20 in.) measured when the toy is rotating at any speed up to a maximum of 80 revolutions per minute.

ASTM F963 also specifies an exemption for two kinds of toys: 1) paddle balls and 2) sport balls with wrist or ankle straps longer than 70 cm (27,6 in.) intended to be kicked or thrown and returned to the user. These exemptions are not present in ISO 8124-1 or EN 71-1.

6.34 Straps intended to be worn fully or partially around the neck

The clauses for straps intended to be worn fully or partially around the neck are indicated in [Table 120](#).

Table 120 — Clauses related to straps intended to be worn fully or partially around the neck

ISO 8124-1	EN 71-1	ASTM F963
4.33 Straps intended to be worn fully or partially around the neck	5.14 Straps intended to be worn fully or partially around the neck (See A.53) 8.38 Breakaway feature separation test (See 5.4 b), 5.4 c) and 5.14)	—

ISO 8124-1 and EN 71-1 are generally in alignment. There is a minor difference where the exemption in EN 71-1 is broader than ISO 8124-1. ASTM F963 has no corresponding requirement. See [Table 121](#).

Table 121 — Comparison of straps intended to be worn fully or partially around the neck

	ISO 8124-1	EN 71-1
Requirement	Toys intended for children under 36 months with straps intended to be worn fully or partially around the neck, and which create a fixed loop, shall have a breakaway feature which breaks when tested according to 5.11.3	Toys with straps intended to be worn fully or partially around the neck and which create a fixed loop shall have a breakaway feature which breaks when tested according to 8.38
Exemption	Safety harnesses, backpack shoulder straps and the straps of bag/bucket/box handles are excluded from this requirement	This requirement does not apply to straps in safety harnesses, straps in imitation safety harnesses (e.g. on toy pushchairs), shoulder or waist straps (e.g. on toy bags, backpacks and fairy wings), and handles (e.g. on toy bags, toy cradles, toy carry cots, toy buckets and boxes)

6.35 Sledges and toboggans with cords for pulling

The clauses for sledges and toboggans with cords for pulling are indicated in [Table 122](#).

Table 122 — Clauses related to sledges and toboggans with cords for pulling

ISO 8124-1	EN 71-1	ASTM F963
4.34 Sledges and toboggans with cords for pulling	5.15 Sledges with cords for pulling	—
B.2.24 Sledges and toboggans with cords for pulling	7.24 Sledges with cords for pulling	

ISO 8124-1 and EN 71-1 are generally in alignment. In ISO 8124-1 and EN 71-1, sledges intended for outdoor use on snow under adult supervision, which are equipped with a cord for pulling should carry a warning: "Warning. Strangulation hazard. Long cord. Adult supervision required". ASTM F963 has no corresponding requirement.

6.36 Jaw entrapment in handles and steering wheels

The clauses for jaw entrapment in handles and steering wheels are indicated in [Table 123](#).

Table 123 — Clauses related to jaw entrapment in handles and steering wheels

ISO 8124-1	EN 71-1	ASTM F963
4.35 Jaw entrapment in handles and steering wheels	—	4.39 Jaw entrapment in handles and steering wheels

The requirements in ISO 8124-1 and ASTM F963 are in alignment. EN 71-1 has no corresponding requirement.

6.37 Toy gun markings (refer to ISO 8124-1:2018, Annex D)

The requirements for toy gun markings are similar in ISO 8124-1 and ASTM F963. EN 71-1 has no corresponding requirement. Details are indicated in [Table 124](#).

Table 124 — Clauses related to toy-gun marking

ISO 8124-1	EN 71-1	ASTM F963
Annex D (informative) Toy gun marking	—	4.30 Toy gun marking

6.38 Toys attached to food (refer to ISO 8124-1:2018, B.2.8)

The clauses for toys attached to food are indicated in [Table 125](#).

Table 125 — Clauses related to toys attached to food

ISO 8124-1	EN 71-1	ASTM F963
B.2.8 – Toys in contact with food	4.25 Toys attached to food 8.2 Small parts cylinder (See 4.6, 4.11, 4.18, 4.23.2, 4.23.3, 4.25, 5.1, 5.2 and A.36) 8.32 Small balls and suction cups test (See 4.17, 4.22, 4.25, 5.10 and 5.13)	—

EN 71-1 includes requirements for toys attached to food; these are intended to address the choking hazard associated with unintentional ingestion or inhalation of toys that are attached to food. The requirements do not apply to foodstuffs for consumption.

6.39 Toys comprising monofilament fibres which may present long hair hazards (refer to ISO 8124-1:2018)

The clauses for toys comprising monofilament fibres are indicated in [Table 126](#).

Table 126 — Clauses related to toys comprising of monofilament fibres

ISO 8124-1	EN 71-1	ASTM F963
—	5.9 Toys comprising monofilament fibres (See A.32)	—

Monofilament fibres attached to fabric base is not the usual method of production, but a toy made in this manner was involved in the death of a 5-month old child. EN 71-1 considers the hazards of toys comprised of monofilament fibres and requires a warning. ISO 8124-1 and ASTM F963 do not require a warning for such toys.

6.40 Packaging and packaging components (spherical, egg-shaped or ellipsoidal, and hemispheric-shaped containers)

The clauses for packaging and packaging components are indicated in [Table 127](#).

Table 127 — Clauses related to packaging and packaging components

ISO 8124-1	EN 71-1	ASTM F963
—	6 Packaging c) d) e)	A.2 Packaging and shipping

NOTE Packaging thickness requirement for plastic film refers to [6.10](#) above.

EN 71-1 specifies the requirements for packaging and packaging components as follows:

- a) small ball requirements apply to packaging and packaging components that are small balls.
- b) regardless of the intended grade of the toy, any separable part of its packaging, which is a small ball or that has a cylindrical shape with a rounded end, shall not pass through template E, unless the parts have either a major axis greater than 64 mm in length, or where the parts are attached to another part of the packaging with an attachment that does not break when tested to the torque test and/or the tension test.
- c) hemispheric-shaped toy requirements apply to hemispheric-shaped containers that are part of the packaging for toys intended for children under 36 months.

Annex A (informative)

Index of requirements in EN 71-1

Table A.1 — Index of requirements in EN 71-1

EN 71-1	ISO 8124-1	ASTM F963
4.1 Material cleanliness (See A.3) 5.2 Soft-filled toys and soft-filled parts of a toy (See A.27)	4.3 Material 4.3.1 Material quality See E.4	4.1 Material quality 4.3.7 Stuffing materials
4.2 Assembly (See A.4)	—	4.6.1.3 Toys that are intended to be assembled by an adult and contain potentially hazardous 5.8 Toys Intended to be Assembled By an Adult
4.3 Flexible plastic sheeting (See A.5 and A.16) 5.3 Plastic sheeting (See A.28) 6 Packaging (See A.56)	4.10 Plastic film or plastic bags in packaging and in toys	4.12 Plastic film
8.25 Plastic sheeting 8.25.1 Thickness (See 4.3, 5.3 and Clause 6) 8.25.2 Adhesion (See 5.3)	5.10 Determination of thickness of plastic film and sheeting	8.22 Plastic film thickness
4.4 Toy bags	4.11.10 Cords on toy bags	4.14.5 Cords on toy bags intended for children up to 18 months
4.5 Glass (See 5.7 and A.6) 5.7 Glass and porcelain (See 4.5 and A.6)	4.6.1 Accessible sharp edges of glass or metal	4.7.1 Potentially hazardous sharp metal and glass edges
4.6 Expanding materials (See A.7) 8.14 Expanding materials (See 4.6)	4.3.2 Expanding materials See E.5. 5.21 Expanding materials	4.40 Expanding Materials 8.30 Expanding Materials – Test Method
4.7 Edges (See A.8) 4.7 a) (metal and glass edges only) 4.7 b) 5.1 b) 8.11 Sharpness of edges	4.6 Edge (See E.11) 4.6.1 Accessible sharp edges of glass or metal 4.6.3 Edges on metal toys 5.8 Sharp-edge test	4.7.1 Potentially hazardous sharp metal and glass edges 4.7.3 Metal Toys 5.8 Toys intended to be assembled by an adult
4.7 c)	4.6.4 Edges on moulded toys	4.7.4 Molded toys
4.7 d) 7.6 Hazardous sharp functional edges and points (See 4.7 and 4.8)	4.6.2 Functional sharp edges B.2.12 Toys with functional sharp edges and functional sharp points	4.7.2 Toys containing potentially hazardous edges that are a necessary part of the function of a toy 5.10 Toys with functional sharp edges or points