

Safety of toys —

Part 1: Mechanical and physical properties

ICS 97.200.50

National foreword

This British Standard is the UK implementation of EN 71-1:2005+A9:2009, incorporating corrigendum February 2006. It supersedes BS EN 71-1:2005+A8:2009 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

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A list of organizations represented on this committee can be obtained on request to its secretary.

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physikalische Eigenschaften

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 71-1:2005+A9:2009) has been prepared by Technical Committee CEN/TC 52 "Safety of toys", the secretariat of which is held by DS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.

This document includes Amendment 1, approved by CEN on 2007-01-10, Amendment 3 approved by CEN on 2006-09-07, Amendment 4 approved by CEN on 2007-03-13, Amendment 5 approved by CEN on 2008-04-18, Amendment 6 approved by CEN on 2008-02-05, Amendment 7 approved by CEN on 2009-04-30, Amendment 8 approved by CEN on 2009-03-01, Amendment 9 approved by CEN on 2009-05-23 and the Corrigendum issued on 2006-02-01.

This document supersedes A9 EN 71-1:2005+A8:2009 A9.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1, A3 A3, A4 A4, A5 A5, A6 A6, A7 A7, A8 A8 and A9 A9.

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags AC AC.

A4 *deleted text* A4

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this European Standard.

This European Standard constitutes the first part of the European Standard on safety of toys.

This European Standard for safety of toys consists of the following parts:

- Part 1: *Mechanical and physical properties*
- Part 2: *Flammability*
- Part 3: *Migration of certain elements*
- Part 4: *Experimental sets for chemistry and related activities*
- Part 5: *Chemical toys (sets) other than experimental sets*
- Part 7: *Finger paints – Requirements and test methods*
- Part 8: *Swings, slides and similar activity toys for indoor and outdoor family domestic use*
- Part 9: *Organic chemical compounds – Requirements*
- Part 10: *Organic chemical compounds – Sample preparation and extraction*
- Part 11: *Organic chemical compounds – Methods of analysis*

NOTE 1 In addition to the above parts of EN 71, the following guidance documents have been published: CEN Report, CR 14379:2002, *Classification of toys - Guidelines*, CEN Technical Report CEN/TR 15071:2005, *Safety of toys - National translations of warnings and instructions for use in EN 71* and CEN Technical Report CEN/TR 15371:2009, *Safety of toys – Replies to requests for interpretation of EN 71-1, EN 71-2, and EN 71-8* A4.

NOTE 2 Different legal requirements may exist in non-EU countries.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia,

Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

The European Standards aim at reducing as far as possible those risks which are not evident to users; they do not cover inherent dangers (e.g. instability of scooters, sharp needles in a sewing kit etc.) that are obvious to children or the persons in charge of them. Assuming that the toys are used in the manner for which they are intended, they should not present any further risk to children for whom they are intended. Allowance should also be made for normal or foreseeable use, bearing in mind the normal behaviour of children who do not generally share the same degree of care as the average adult user.

As a general rule, toys are designed and manufactured for particular ages of children. Their characteristics are related to the age and stage of development of the children, and their use presupposes certain aptitudes.

Accidents are frequently due to a toy either being given to a child for whom it is not intended, or being used for a purpose other than that for which it was designed. Great care should therefore be taken when choosing a toy or game; account should be taken of the mental and physical development of the child who will be using it.

The requirements of this European Standard do not release parents or carers from their responsibility of watching over the child while he or she is playing.

1 Scope (see A.2)

This European Standard specifies requirements and methods of tests for mechanical and physical properties of toys.

This European Standard applies to toys for children, toys being any product or material designed or clearly intended for use in play by children of less than 14 years. It 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 normal behaviour of children.

It includes specific requirements for toys intended for children under 36 months and for children who are too young to sit up unaided. For the purpose of this European Standard, *soft-filled* toys with simple features intended for holding and cuddling are considered as toys intended for children under 36 months.

This European Standard also specifies requirements for *packaging*, marking and labelling.

This European Standard does not cover musical instruments, sports equipment or similar items but does include their toy counterparts.

This European Standard does not cover electrical safety aspects of toys. These are covered by  EN 62115, Electric toys - Safety .

Furthermore, it does not cover the following items which, for the purpose of this European Standard, are not considered as toys:

- Christmas decorations (see A.2);
- detailed scale models for adult collectors (see A.2);
- equipment intended to be used collectively in playgrounds;
- sports equipment;
- aquatic equipment intended to be used in deep water;
- folk dolls and decorative dolls and other similar articles for adult collectors;
- "professional" toys installed in public places (shopping centres, stations etc.) (see A.2);
- puzzles with more than 500 pieces or without picture, intended for specialists;
- air guns and air pistols (see A.2);
- fireworks, including percussion caps except percussion caps specifically designed for toys;
- slings and catapults (see A.2);
- sets of darts with metallic points;
- electric ovens, irons or other functional products operated at a nominal voltage exceeding 24 V;
- products containing heating elements intended for use under the supervision of an adult in a teaching context;
- vehicles with combustion engines (see A.2);
- toy steam engines;
- bicycles designed for sport or for travel on the public highway;
- video toys that can be connected to a video screen, operated at a nominal voltage exceeding 24V;
- babies' dummies (soothers);
- faithful reproductions of real fire arms;
- fashion jewellery for children (see A.2).

Also, for the purpose of this European Standard, the following items are not considered as toys:

- flotation aids such as arm bands and swim seats (see A.23);
- swimming goggles, sunglasses and other eye protectors as well as bicycle and skateboard helmets (see A.19);
- items that are propelled into free flight by a child releasing an elastic band (e.g. aeroplanes and rockets). These are considered as catapults (see 11th indent above);
- bows for archery with an overall relaxed length exceeding 120 cm.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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EN 71-8, *Safety of toys — Part 8: Swings, slides and similar activity toys for indoor and outdoor family domestic use*

EN 60318-1, *Electroacoustics — Simulators of human head and ear — Part 1: Ear simulator for the calibration of supra-aural earphones (IEC 60318-1:1998)*

EN ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

EN ISO 3746:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995)*

EN ISO 4287, *Geometrical product specifications (GPS) - Surface texture: Profile method - Terms, definitions and surface texture parameters (ISO 4287:1997)*

EN ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*  (ISO 6508-1:2005) 

EN ISO 11201, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995)*

EN ISO 11202, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Survey method in situ (ISO 11202:1995)*

EN ISO 11204, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Method requiring environmental corrections (ISO 11204:1995)*

ISO 4593, *Plastics — Film and sheeting — Determination of thickness by mechanical scanning*

ISO 7619-2, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 2: IRHD pocket meter method*

 IEC 60318-5, *Electroacoustics — Simulators of human head and ear — Part 5: 2 cm³ coupler for the measurement of hearing aids and earphones coupled to the ear by means of ear inserts* 

3 Terms and definitions

For the purpose of this European Standard, the following terms and definitions apply.

3.1

accessible

contactable under the test conditions of 8.10 (accessibility of a part or component)

3.2

aquatic toy

article, whether inflatable or not, intended to bear the mass of a child and used as an instrument of play in shallow water

3.3

backing

material adhering to flexible *plastic sheeting*

3.4

ball

 spherical, ovoid, or ellipsoidal object, usually but not always, designed or intended to be thrown, hit, kicked, rolled, dropped or bounced

The term *ball* also includes any multisided object formed by at least 48 connecting planes into a generally spherical, ovoid or ellipsoidal shape 

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3.5

burr

roughness, caused by not cleanly severing or finishing the material

3.6

close-to-the-ear toy

toy that is clearly designed to emit sound, intended to be used close to the ear, i.e. a hypothetical position, normally 2,5 cm from the nearest sound emitting part of the toy that can be put against the ear of a child (e.g. telephones that ring or beep in the ear piece and toys with earphones)

3.7

collapse

sudden or unexpected folding of a structure

3.8

cord

piece of slender, flexible material including monofilaments, woven and twisted cord, rope, plastic textile tapes, ribbon and those fibrous materials commonly called string

NOTE Monofilament doll hair is not considered as a cord.

3.9

crack

fracture of a material to the full thickness of the material

3.10

crushing

injury to part of the body resulting from compression between two surfaces

3.11

driving mechanism

assembly of linked parts of a toy, at least one of which moves and is driven either electrically, by clockwork or by other mechanical means and including gears, belts and winding mechanisms

3.12

edge

line formed at the junction of two surfaces, the length of which exceeds 2,0 mm

3.13

expanding material

material, the volume of which expands when the material is exposed to water

3.14

fastening

mechanical device which attaches two or more components of a toy together (e.g. a screw)

3.15

filling

material intended to be wholly contained within a *soft-filled* toy  or within *soft-filled* parts of a toy 

3.16

free-wheeling toy bicycle

two-wheeled vehicle, with or without stabilisers, with a *maximum saddle height* of 435 mm or less and which is propelled solely by the muscular energy of the person on that vehicle, in particular by means of pedals, and which does not have a fixed transmitted drive

3.17

functional edge or point

edge or point which is essential for the functioning of a toy (e.g. microscope slides, electrical conductors, needles)

3.18

functional toy

toy which performs and is used in the same way as an appliance or an installation intended for adults and is often a scale model of a certain product (e.g. a stove with heating properties)

3.19

fuzz

bits of fibrous type material that can be readily removed from toys with a pile surface

3.20

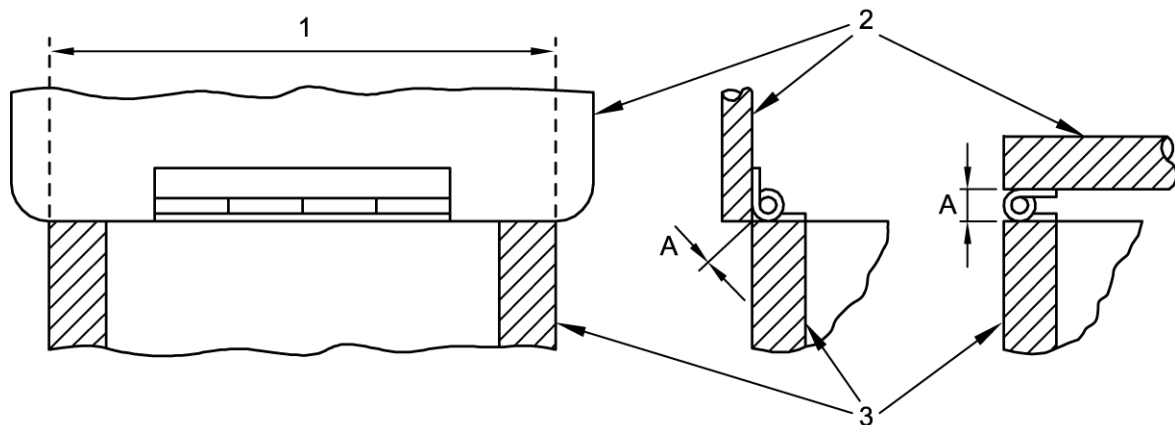
hand-held toy

toy that is clearly designed to emit sound, intended to be held in the hand (e.g. clicking toys, toy *tools*, musical toys and cap-firing toys) but excluding *close-to-the-ear* toys and child-actuated toys as well as mouth-actuated toys

3.21

hinge line

line along or parallel to the line projected through the axis of rotation as shown in Figure 1



Key

- 1 Hinge line
- 2 Lid
- 3 Box
- A Hinge-line clearance between assembled edges

Figure 1 – Definition of hinge line

3.22

large and bulky toy

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

NOTE 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.

3.23

maximum saddle height

vertical distance from the ground to the top of the seat surface, measured with the seat in a horizontal position and with the seat pillar set to the minimum insertion mark

3.24

overlap joint

joint in which an edge overlaps a parallel surface but is not necessarily mechanically attached to it at all points along the length

3.25

packaging

material accompanying the toy when purchased but having no intended play function

3.26

paper

material, marketed as either paper or paperboard, with a mass per unit area of 400 g/m² or less

3.27

particle

object with a discrete three-dimensional form (e.g. expanded polystyrene), but excluding fibrous material

3.28

plastic sheeting

thin section plastic sheeting which is used as part of the toy or as part of the packaging

3.29

projectile

object intended to be launched into free flight or a trajectory in the air

3.30

projectile toy with stored energy

toy with a projectile propelled by means of a discharge mechanism capable of storing and releasing energy

3.31

projectile toy without stored energy

toy with a projectile discharged by the energy imparted by a child

3.32

rattle

toy that is clearly designed to emit sound when shaken, intended for children who are too young to sit up unaided, and activated by the child or another person

3.33

removable component

part or component which is intended to be removed from the toy without the use of a *tool*

3.34

soft-filled toy

toy, clothed or unclothed, with soft body surfaces and filled with soft materials, readily allowing compression of the main part of the toy with the hand

3.35

splinter

sharp pointed fragment

3.36

spring

3.36.1

helical spring

spring in the form of a coil, which can be either a compression spring or an extension spring, see Figure 2

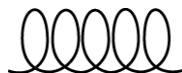


Figure 2 – Helical spring

3.36.1.1

compression spring

spring which returns to its initial state after release of the compressive force

3.36.1.2

extension spring

spring which returns to its initial state after release of the tensile force

AC 3.36.2 AC

spiral spring

clockwork type spring, see Figure 3



Figure 3 – Spiral spring

3.37

squeeze toy

pliable toy incorporating a noise-making feature activated by forcing air through an opening, clearly designed to emit sound when squeezed, intended for children who are too young to sit up unaided

3.38

suction cup

means of temporarily attaching a toy to a smooth surface made of soft, flexible, polymeric material, normally having a circular base which adheres to the surface when pressed against it, and in this way creating a vacuum

3.39

table-top and floor toy

toy that is intended to be used on a table or floor (e.g. cars, mechanical animals, *large and bulky toys*)

3.40

teether

toy designed for oral use intended primarily for symptomatic relief of children's teething discomfort

3.41

tool

screwdriver, coin or any other object which can be used to operate a screw, clip or similar fixing device

3.42

toy scooter

free-wheeling ride-on toy 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

NOTE The definition includes ordinary "old-fashioned" scooters as well as foldable scooters.



3.43

magnetic component

any part of a toy which contains an attached or fully- or partially-enclosed magnet

3.44

magnetic/electrical experimental set

toy containing one or more magnets intended for carrying out educational experiments involving magnetism and electricity

3.45

functional magnet in electrical or electronic components of toys

any magnet necessary for the function of motors, relays, speakers and other electrical or electronic components in a toy where the magnetic properties are not part of the play pattern of the toy 

4 General requirements

NOTE Words in *italics* are defined in Clause 3 (Terms and definitions). Additional information on the background and rationale for various requirements is given in Annex A.

4.1 Material (see A.3)

Toys and material used in toys shall be visually clean and free from infestation. The material shall be assessed visually by the unaided eye rather than under magnification.

4.2 Assembly (see A.4)

If a toy is intended to be assembled by a child, the requirements in this European Standard apply to each unit made available to the child and to the assembled toy. The requirements for the assembled toy do not apply to toys where the assembling provides a significant part of the play value of the toy.

If a toy is intended to be assembled by an adult, the requirements apply to the assembled toy.

Toys intended to be assembled shall be accompanied by detailed assembly instructions, if appropriate. The instructions shall indicate whether it is necessary that an adult assemble the toy or whether the proper assembly shall be checked by an adult before use.

4.3 Flexible plastic sheeting (see A.5 and A.16)

Toys with flexible *plastic sheeting* shall conform to the following requirements:

- a) Sheets without any backing and of an area greater than 100 mm x 100 mm shall have an average thickness of 0,038 mm or more when tested according to 8.25.1 (plastic sheeting, thickness).
- b) Sheets with an average thickness of less than 0,038 mm and of an area greater than 100 mm x 100 mm shall be perforated with defined holes so that a minimum of 1 % of the area has been removed over any area of 30 mm x 30 mm.
- c) For plastic balloons, the requirements in item a) apply to double layers of *plastic sheeting* (i.e. the thickness is measured without inflating or destroying the balloon).

4.4 Toy bags

Toy bags with an opening perimeter greater than 380 mm having a drawstring as a means of closure shall either:

- a) be made of material permeable to air; or
- b) comply with requirements given in 4.14.2 a) (masks and helmets).

4.5 Glass (see 5.7 and A.6)

Accessible glass may be used in the construction of toys for children of 36 months and over where:

- a) its use is necessary to the function of the toy (e.g. optical toys, glass light bulbs, glass in experimental sets);
- b) it is textile glass used for reinforcement;
- c) it is in the form of solid glass marbles or solid glass eyes for dolls;



- d) it is in the form of other glass elements (e.g. glass beads) that after being subjected to 8.5 (drop test) and 8.7 (impact test) do not expose *accessible* hazardous sharp *edges* (see 8.11, sharpness of edges) or hazardous sharp points (see 8.12, sharpness of points).

4.6 Expanding materials (see A.7)

The requirement in 4.6 does not apply to seeds in growing kits.

Toys and components of toys made of *expanding materials*, which fit entirely in the cylinder specified in 8.2 (small parts cylinder) before or after being 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) shall not expand more than 50 % in any dimension when tested according to 8.14 (expanding materials).

4.7 Edges (see A.8)

Accessible edges shall not present an unreasonable risk of injury.

- a) *Edges* of metal or glass are considered as potentially hazardous sharp *edges* if they are sharp as determined according to 8.11 (sharpness of edges). If the *edges* fail the test, they shall be assessed to determine whether they present an unreasonable risk of injury taking into account the foreseeable use of the toy. Regardless of the manner in which the *edges* are finished, they shall be tested according to 8.11.

NOTE *Edges* may be folded, rolled or spiralled in order to make them *inaccessible*, or protected by a coating of plastic or other similar material.

- b) In *overlap joints*, the *edge* of the sheet metal shall conform to item a) when the sheet metal has a thickness of 0,5 mm or less and the clearance to the underlying surface is greater than 0,7 mm.
- c) *Edges* of metal including *fastenings* (e.g. screw heads) and of rigid polymeric material shall be free from *burr* capable of causing wounds or abrasion.

Flashings on pliable polymeric materials (e.g. polyolefins) are not considered as *burr*.

- d) Where it is essential for the functioning of the toy, hazardous sharp *functional edges* may be used in toys intended for children of 36 months and over. The potential danger presented by such *edges* shall be drawn to the attention of the user (see 7.6). However, *edges* of pieces intended to serve as electric conductors, microscope slides and cover slips do not require a warning.

4.8 Points and metallic wires (see A.9)

 Metallic wires  and *accessible* points shall not present an unreasonable risk of injury.

- a) Points are considered as potentially hazardous sharp points if they are sharp as determined according to 8.12 (sharpness of points). If the points fail the test, they shall be assessed to determine whether they present an unreasonable risk of injury taking into account the foreseeable use of the toy (see also 5.1 c)).

Points of pencils and similar writing and drawing implements are not considered as sharp points.

- b) Where it is essential for the functioning of the toy, hazardous sharp *functional points* may be used in toys intended for children of 36 months and over. The potential danger presented by such points shall be drawn to the attention of the user (see 7.6). However, points of pieces intended to serve as electrical conductors do not require a warning.
- c)  Metallic wires and other metallic components that are designed and intended to be bent, for example, in order to change the shape or position of a toy or part of a toy (e.g. in *soft-filled toys*), shall not break and produce hazardous sharp points, or protrude through any surface covering of the toy, when tested according to 8.13.2 (metallic wires and other metallic components intended to be bent). 
- d)  Metallic wires that are not designed to be bent but are likely to occasionally or accidentally be bent during play shall not break and produce hazardous sharp points, or protrude through any surface covering of the toy, when tested according to 8.13.3 (metallic wires likely to be bent). 

4.9 Protruding parts (see A.10)

Tubes and rigid components in the form of projections which constitute a puncture hazard to a child shall be protected. This protection shall not be removed when tested according to 8.4.2.3 (tension test, protective components).

The ends of spokes on toy umbrellas shall be protected. If the protection is removed when tested according to 8.4.2.3 (tension test, protective components), the ends of the spokes shall be free from hazardous sharp *edges* and hazardous sharp points when tested according to 8.11 (sharpness of edges) and 8.12 (sharpness of points). In addition, if the protection is removed, the spokes shall have a diameter of 2 mm or more and shall have ends with no *burr* and a smooth, rounded and approximately spherical finish.

4.10 Parts moving against each other

4.10.1 Folding and sliding mechanisms (see A.11)

The requirements in 4.10.1 do not apply to toys with a potential sitting surface width of less than 140 mm.

Toys with folding and sliding mechanisms shall conform to the following requirements:

- a) 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 shall automatically engage when the toy is erected.

When tested according to 8.18.2 a) (toy pushchairs and perambulators), the toy shall not *collapse* and neither of the locking devices shall fail or disengage.

Two devices of the same construction (e.g. locking rings), one on the left-hand side and one on the right-hand side of the toy, are considered to be one locking device.

If it is possible to partially erect a toy pushchair or perambulator without one of the locking devices being engaged, the test of 8.18.2 a) (toy pushchairs and perambulators) shall be performed in this orientation.

An example of a toy pushchair or perambulator covered by item a) is illustrated in Figure 4.

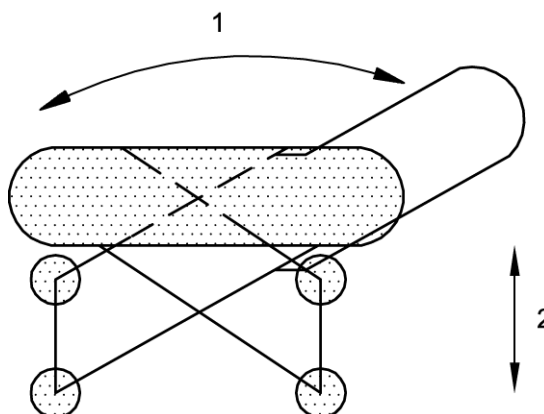
NOTE Partially erect means erected in such a way that the user might wrongly believe the toy to be fully erect.

- b) Toy pushchairs and perambulators that do not otherwise constitute a 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.

When tested according to 8.18.2 b) (toy pushchairs and perambulators) the toy shall not *collapse* and the locking device or safety stop shall not fail or disengage.

If it is possible to partially erect a toy pushchair or perambulator without a locking device being engaged, the test of 8.18.2 b) shall be performed in this orientation (see also Note in 4.10.1 a)).

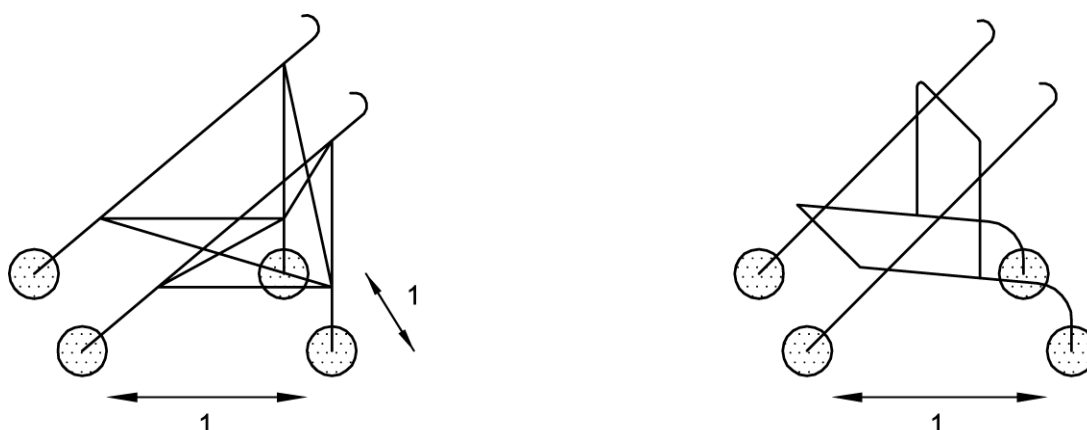
Examples of toy pushchairs and perambulators covered by item b) are illustrated in Figure 5.



Key

- 1 Handle movement
- 2 Chassis movement

Figure 4 – Example of toy pushchair or perambulator covered by 4.10.1 a)



Key

- 1 Chassis movement

Figure 5 – Examples of toy pushchairs covered by 4.10.1 b)

- c) Folding devices on other collapsible toys (e.g. ironing boards, folding chairs and tables etc.) which may have a scissorlike action:
 - 1) shall have a safety stop or locking device. When tested according to 8.18.3 (other collapsible toys), the toy shall not *collapse* nor shall the locking device fail or disengage; and
 - 2) shall have a clearance of 12 mm or more between moving parts which constitute a scissorlike action.
- d) Toys other than those covered by item a), b) or c) above, with folding or sliding mechanisms intended to bear or capable of bearing the mass of a child and capable of injuring fingers, shall be so constructed that the space between moving elements shall also allow a 12 mm diameter rod to be inserted if it allows a 5 mm diameter rod to be inserted.

4.10.2 Driving mechanisms (see A.12)

The requirements in 4.10.2 a) and b) do not apply to *driving mechanisms* with insufficient power to injure fingers or other parts of the body.

Driving mechanisms and winder keys shall conform to the following requirements:

- a) *Driving mechanisms* shall be enclosed in such a way that they do not expose *accessible* hazardous sharp edges (see 8.11, sharpness of edges) or hazardous sharp points (see 8.12, sharpness of points) or otherwise present a hazard of *crushing* the fingers or other parts of the body when tested according to 8.5 (drop test) and 8.7 (impact test).
- b) *Driving mechanisms* within *large and bulky toys* shall be enclosed in such a way that they do not expose *accessible* hazardous sharp edges (see 8.11, sharpness of edges) or hazardous sharp points (see 8.12, sharpness of points) or otherwise present a hazard of *crushing* the fingers or other parts of the body when tested according to 8.6 (tip over test).
- c) The shape and dimensions of winder keys or starting handles shall be such that the clear space between the key or the handle and the body of the toy shall also allow a 12 mm diameter rod to be inserted if it allows a 5 mm diameter rod to be inserted. Any holes in keys or handles shall not permit the insertion of a 5 mm diameter rod.

4.10.3 Hinges (see A.13)

This requirement does not apply if any part joined by one or more hinges has a mass of less than 250 g.

Toys having two parts joined by means of one or more hinges and with a space between the assembled edges along the *hinge line*, shall be so constructed that this space with the parts in any position shall also allow a 12 mm diameter rod to be inserted if it allows a 5 mm diameter rod to be inserted.

4.10.4 Springs (see A.14)

Springs shall conform to the following requirements:

- a) *Spiral springs* shall not be *accessible* if the gap between two consecutive spirals is greater than 3 mm in any position of use.

The requirement in b) does not apply to *springs* that do not return to their original position after unloading (i.e. if the elastic limit is exceeded).

- b) Extension *helical springs* shall not be *accessible* if the gap between two consecutive turns is greater than 3 mm when the *spring* is subjected to a tensile force of 40 N.

The requirement in c) does not apply to *springs* that do not return to their original position after loading with a force of 40 N or to *springs* wound round a second component of the toy (for example a guiding rod) so that it is not possible to insert the *accessibility* probe A  (see Figure 17, accessibility probe)  between consecutive coils by more than 5 mm.

- c) Compression *helical springs* shall not be *accessible* if the gap between two consecutive turns is greater than 3 mm at rest, and the *spring* can be subjected to a force of 40 N or more when the toy is in use.

4.11 Mouth-actuated toys (see A.15)

Mouth-actuated toys shall conform to the following requirements:

- a) Mouth-actuated toys and *removable* mouthpieces of mouth-actuated toys shall not fit entirely in the cylinder when tested according to 8.2 (small parts cylinder).

- b) Mouthpieces of mouth-actuated toys, if detached when tested first according to 8.9 (soaking test) and then according to 8.3 (torque test) and 8.4.2.1 (tension test, general), shall not fit entirely in the cylinder when tested according to 8.2 (small parts cylinder).
- c)  Mouth-actuated toys which contain loose components such as spheres in a whistle or reeds in a noisemaker shall not, when tested according to 8.17.2 (other mouth-actuated toys), release any objects that fit entirely in the cylinder when tested according to 8.2 (small parts cylinder). 
- d) Mouthpieces fitted to balloons shall conform to the requirements in items a) and b).
- e)  Mouth-actuated projectile toys (e.g. peashooters) shall have a mouth piece which does not allow the intended *projectiles* to pass through when tested according to 8.17.1 (mouth-actuated projectile toys), and thereafter does not become detached when tested according to 8.3 (torque test) and 8.4.2.1 (tension test, general). 

4.12 Balloons (see 4.3 and A.16)

The *packaging* of latex balloons shall carry a warning (see 7.3).

The *packaging* of natural rubber latex balloons shall indicate that the balloons are made of natural rubber latex (see 7.3).

4.13 Cords of toy kites and other flying toys (see A.17)

Cords of toy kites and other flying toys linking the toy to the child and with a length of more than 2 m, shall be made of material with an electric resistance exceeding 100 MΩ/cm of *cord*, when measured according to 8.19 (electric resistivity of cords).

The potential danger of flying a toy kite near overhead power lines and during thunderstorms shall be drawn to the attention of the user (see 7.9).

4.14 Enclosures

4.14.1 Toys which a child can enter (see A.18)

Toys which a child can enter shall conform to the following requirements:

- a) Any toy having a door, lid or similar device which encloses a continuous volume greater than 0,03 m³ and in which all internal dimensions are 150 mm or more, shall provide at least two unobstructed ventilation holes, each 650 mm² or more, situated at least 150 mm apart. The total ventilation area shall be provided when the toy is placed on the floor in any position and adjacent to two vertical plane surfaces meeting at a 90° angle, so as to simulate the corner of a room.

The ventilation area is not required if a permanent partition or bars (two or more) which effectively limit the continuous space by making the largest internal dimension less than 150 mm, are used to subdivide a continuous space.

- b) For such 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.

NOTE This requirement notably precludes the use of buttons, zips and similar *fastenings* on doors, lids or similar devices.

- c) Toy chests with vertically opening hinged lids shall be provided with lid-support mechanisms to prevent sudden *collapse* or dropping of the lid. The lid-support mechanism shall support the lid so that at no position in the arc of travel of the lid from within 50 mm of the fully closed position through an arc not to exceed 60° from the fully closed position shall it drop more than 12 mm under the influence of its own mass, except in the last 50 mm of travel. The test shall be performed according to 8.31.1 (lid support).

The lid-support mechanism shall conform to this requirement before and after being subjected to 7 000 opening and closing cycles, as described in 8.31.2 (durability test for vertically opening hinged lids).

The lid-support mechanism shall not require adjustment by the consumer to ensure adequate lid support, nor shall it require adjustment in order to conform to the above requirement after being cycled according to 8.31.2 (durability test for vertically opening hinged lids).

The lid and lid-support mechanism shall conform to the requirements in 4.10.3 (hinges).

Toys chests with vertically opening hinged lids shall be accompanied by instructions for proper assembly and maintenance.

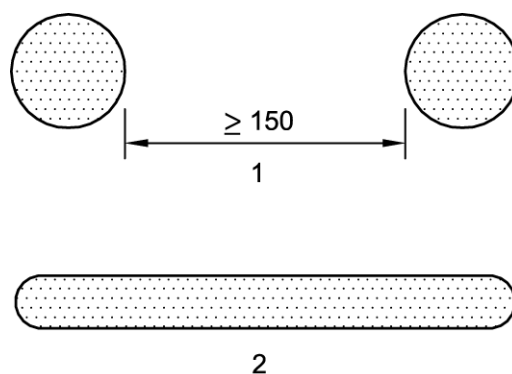
4.14.2 Masks and helmets (see A.19)

Masks and helmets shall conform to the following requirements:

- a) Masks and helmets that fully enclose the head and which are made of impermeable material 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.

An example of an equivalent single ventilation area is given in Figure 6.

Dimensions in millimetres



Key

- 1 Total ventilation area, 1 300 mm² or more
2 Alternative equivalent ventilation area, 1 300 mm² or more

Figure 6 – Example of an equivalent single ventilation area

- b) All rigid materials that cover the face such as goggles, space helmets or face shields shall not expose hazardous sharp *edges* (see 8.11, sharpness of edges), hazardous sharp points (see 8.12, sharpness of points) or loose parts that could enter the eye, before and after being 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).

This also applies to toys made of rigid materials with cut-out eye holes and toys that cover the eyes.

- c) Toys that are imitations of protective masks and helmets (e.g. motorcycle helmets, industrial safety helmets and firemen's helmets) shall carry a warning (see 7.8).

4.15 Toys intended to bear the mass of a child (see A.20)

4.15.1 Toys propelled by a child or by other means

4.15.1.1 General

Toys propelled by a child or by other means and intended to bear the mass of a child, e.g.:

- 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,

shall conform to the requirements of the following subclauses of 4.15.1.

The requirements in 4.15.1.2 ~~A3~~ *deleted text* ^{A3} and 4.15.1.5 do not apply to *free-wheeling toy bicycles*, which are covered in 4.15.2, and to *toy scooters*, which are covered in 4.15.5.

4.15.1.2 Warnings and instructions for use

Toys intended to bear the mass of a child shall, when appropriate, be accompanied by instructions for use, assembly and maintenance. The potential dangers of using the toy and precautions to be taken shall be brought to the attention of the user.

Roller skates, inline skates and skateboards for children offered for sale as toys shall carry a warning (see 7.10).

Toys that due to their construction, strength, design or other factors are not suitable for use by children of 36 months and over shall carry a warning (see 7.16).

4.15.1.3 Strength

Toys, when tested according to 8.21 (static strength) and 8.22 (dynamic strength) shall not:

- a) produce *accessible* hazardous sharp *edges* (see 8.11, sharpness of edges);
- b) produce *accessible* hazardous sharp points (see 8.12, sharpness of points);
- c) make *driving mechanisms accessible* that present a hazard of *crushing* the fingers or other parts of the body;
- d) *collapse* so that they do not continue to conform to relevant requirements of this European Standard.

4.15.1.4 Stability

The requirement in 4.15.1.4 does not apply to:

- roller skates, inline skates and toy skateboards;
- toys that by their design do not have a stable base (e.g. pogo sticks, moon hoppers);
- toys intended for children of 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);
- toys with aligned wheels. Wheels with a spacing of 150 mm or less between the centres of the outermost wheels are considered to be a single wheel;

-  toy bicycles with a fixed transmitted drive. 

The toy shall not tip over when tested according to 8.23.1 (stability, toys intended to bear the mass of a child).

4.15.1.5 Braking

The requirements in 4.15.1.5 do not apply to:

- roller skates and toy skateboards;
 - toys where the hands or feet provide the motive power to the driving wheel(s) via direct transmission (e.g. pedal cars, tricycles);
 - electrically propelled ride-on toys which are propelled at a speed of 1 m/s or less unloaded, having a seat height below 300 mm and in which the feet are free.
- a) Mechanically or electrically propelled toys with a free-wheeling facility shall have a braking device. For such toys having a mass of 30 kg or more, it shall be possible to lock at least one brake in a braking position.

The toy shall not move more than 5 cm when tested according to 8.26.1 (brake performance for toys other than *toy bicycles*).

NOTE A toy can be expected to be free-wheeling if it accelerates down a slope of 10° when loaded with a mass of 50 kg, but the same toy is not free-wheeling when loaded as in 8.21 (static strength) and pulled on a horizontal plane covered with a surface of abrasive paper (aluminium oxide P60) at a constant speed of $(2 \pm 0,2)$ m/s:

$$FT_1 \geq (M + 25) \times 1,7; \text{ or} \quad (1)$$

$$FT_2 \geq (M + 50) \times 1,7 \quad (2)$$

where

FT_1 is the maximum pull force in newtons for a toy intended for children under 36 months;
 FT_2 is the maximum pull force in newtons for a toy intended for children of 36 months and over;
 M is the mass of the toy in kilograms.

- b) Electrically propelled ride-on toys shall be operated by means of a switch which cuts off the power automatically when it is released, without tilting the toy. Application of the brakes shall automatically cut power to the drive.

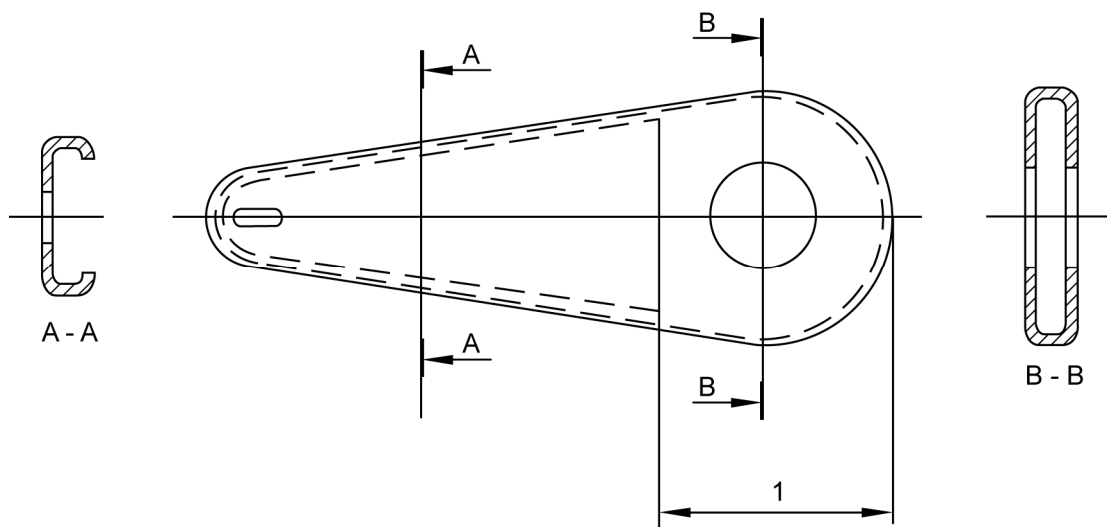
4.15.1.6 Transmission and wheel arrangement

Transmission and wheel arrangement shall conform to the following requirements:

- a) Propelling chains shall have a shield from the crank to the gear wheel at the side where the leg of the child is nearest the chain (side A), and a shield around the crank on the opposite side (side B), (see Figure 7). The shield shall not have slots or holes with a width greater than 5 mm.

It shall not be possible to remove the shield without the use of a *tool*.

- b) Wheels directly propelled by pedals shall not have slots or holes with a width greater than 5 mm.



Key

- 1 Extent of cover on inside face
- A Chain side
- B Crank side

Figure 7 – Propelling chains and chain shield

- c) Spaces between the wheels and the body or parts of the body (e.g. mudguards) shall also allow a 12 mm diameter rod to be inserted if they allow a 5 mm diameter rod to be inserted. This requirement does not apply to the friction surfaces of braking mechanisms, toy skateboards or roller skates.
- d) Tricycles provided with an attached handle used for pushing the child, shall be constructed in such a way as to prevent entrapment of the child's feet in the pedals etc. while being pushed (e.g. free-wheeling mechanism or foot rests).

4.15.2 Free-wheeling toy bicycles (see A.20)

4.15.2.1 General

In addition to relevant requirements in Clause 4, *free-wheeling toy bicycles* shall conform to the following requirements:

4.15.2.2 Instructions for use

Free-wheeling toy bicycles shall be accompanied by assembly and maintenance instructions. The potential dangers of riding *toy bicycles* and precautions to be taken shall be brought to the attention of the parents or carers (see 7.15).

4.15.2.3 Seat pillar minimum insertion mark

The seat pillar shall have a permanent mark that indicates the minimum insertion depth of the pillar into the frame. The minimum insertion mark shall be positioned at a distance not less than two and a half times the diameter of the pillar from the bottom of the full diameter of the pillar and shall not affect the seat pillar strength.

4.15.2.4 Braking requirements

Free-wheeling toy bicycles shall be equipped with two independent braking systems, one which operates on the front wheel and one which operates on the rear wheel.

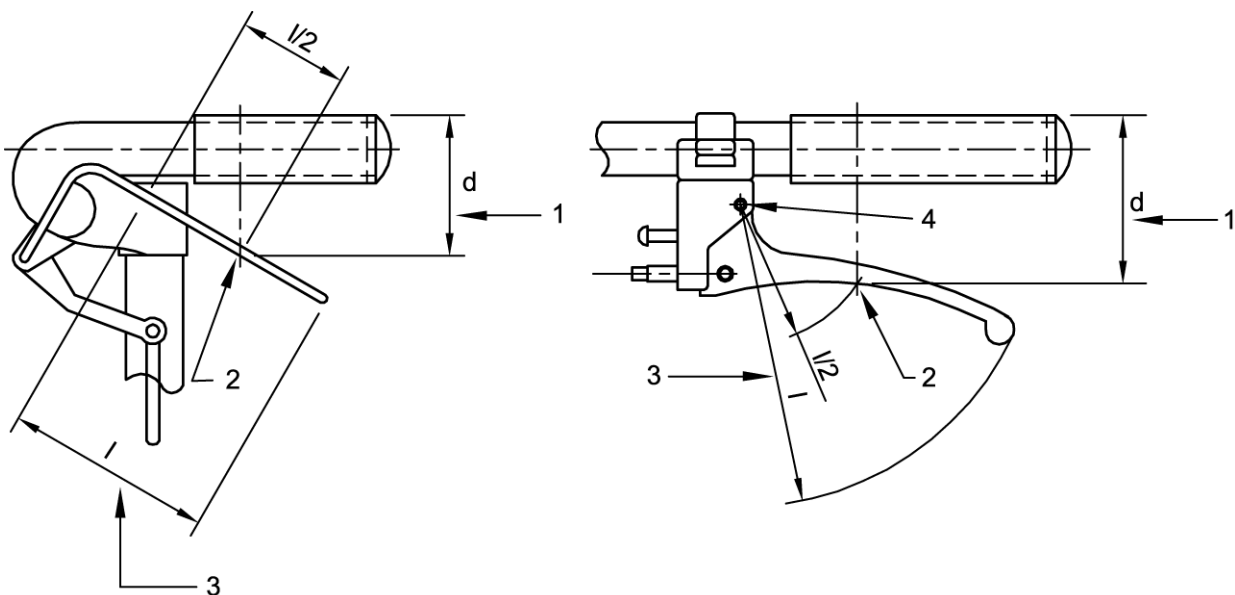
For handbrakes, the brake lever dimension d measured at the midpoint of the lever as shown in Figure 8 shall not exceed 60 mm. The range of adjustment on an adjustable lever shall permit this dimension to be attained. The lever length shall be 80 mm or more.

The toy shall not move more than 5 cm when tested according to 8.26.2 (brake performance for toy bicycles).

4.15.3 Rocking horses and similar toys (see A.21)

Rocking horses and similar toys shall conform to the following requirements:

- The bow rocker of any bow-mounted rocking horse or other rocking toy shall have a limit to its movement which shall at all times hold the user within the extreme of the bow. Compliance is checked by visual inspection.
- The toy shall not tip over when tested according to 8.23.1 (stability, toys intended to bear the mass of a child).
- Toys shall not *collapse* so that they do not continue to conform to relevant requirements of this European Standard when tested according to 8.21 (static strength).
- Toys that due to their construction, strength, design or other factors are not suitable for use by children of 36 months and over shall carry a warning (see 7.16).
-  Toys where the intended sitting surface is 600 mm or more above the ground, shall carry a warning (see 7.19). 



Key

- Brake lever dimension, d
- Midpoint of lever
- Lever length, l
- Pivot

Figure 8 – Handbrake lever dimensions

4.15.4 Toys not propelled by a child

Toys not propelled by a child but designed to bear the mass of a child (but not toys covered by EN 71-8) shall conform to the following requirements:

- a) Toys shall not *collapse* so that they do not continue to conform to relevant requirements of this European Standard when tested according to 8.21 (static strength).
- b) Toys shall not tip over when tested according to 8.23.1 (stability, toys intended to bear the mass of a child). This requirement does not apply to toys which for evident reasons cannot be considered as being stable (e.g. big *balls* and *soft-filled* toy animals).
- c) Toys intended to bear the mass of a child shall, when appropriate, be accompanied by instructions for use, assembly and maintenance instructions.
- d) Toys that due to their construction, strength, design or other factors are not suitable for use by children of 36 months and over shall carry a warning (see 7.16).

4.15.5 Toy scooters (see A.49)

4.15.5.1 General

For the purpose of this European Standard, *toy scooters* are divided into two groups,

- those intended for children with a body mass of 20 kg or less,
- those intended for children with a body mass of 50 kg or less.

In addition to relevant requirements in Clause 4, *toy scooters* shall conform to the requirements of 4.15.5.

4.15.5.2 Warnings and instructions for use

Toy scooters shall carry a warning and an indication about the intended weight group. They shall also be accompanied by instructions for use and precautions to be taken. The potential dangers of riding a *toy scooter* shall be brought to the attention of the parents or carers (see  7.18 .

4.15.5.3 Strength

- a) *Toy scooters* shall conform to the requirements in 4.15.1.3 (strength).
- b) When tested according to 8.27 (strength of toy scooter steering tubes):
 - steering tubes shall not *collapse* so that they do not continue to conform to relevant requirements of this European Standard;
 - steering tubes shall not separate into two or more parts;
 - locking devices shall not fail or disengage.

4.15.5.4 Adjustable and folding steering tubes

- a) To prevent sudden changes of height, steering tubes with adjustable height shall
 - be adjustable with the use of a *tool*, or
 - have at least one main locking device and one secondary locking device of which at least one shall automatically be engaged when the height is adjusted.

The separation of the steering tube shall not be possible unless intended.

- b)  Steering tubes intended to be folded shall have a locking device on the folding mechanism.
- c) The space between moving elements capable of injuring fingers, shall also allow a 12 mm rod to be inserted if it allows a 5 mm rod to be inserted.
- d) Accessible openings in moving elements capable of shearing a finger shall not allow the insertion of a 5 mm rod. 

4.15.5.5 Braking

Toy scooters labelled as intended for children with a body mass of 20 kg or less do not require a braking system.

Other *toy scooters* shall have at least one braking system which shall operate on the rear wheel and which shall effectively and smoothly reduce the speed without coming to an abrupt stop.

When tested according to 8.26.3 (brake performance for toy scooters), the force required to hold the *toy scooter* on the inclined plane shall be less than 50 N.

4.15.5.6 Wheel size

The diameter of the front wheel(s) on *toy scooters* shall be 120 mm or greater.

4.15.5.7 Protruding parts

The handles on *toy scooters* shall have an end with a diameter of 40 mm or more.

4.16 Heavy immobile toys

Heavy immobile toys with a mass greater than 4,5 kg and intended to rest on the floor but not to bear the mass of a child, shall not tip over when tested according to 8.23.2 (stability, heavy immobile toys).

4.17 Projectiles (see A.22)

4.17.1 General

Projectiles and *projectile* toys shall conform to the following requirements:

- a) All rigid *projectiles* shall have a tip radius of 2 mm or more.
- b)  Resilient materials used as impact surfaces shall not become detached when tested according to 8.4.2.3 (tension test, protective components) unless the resulting elements still conform to the relevant requirements of this part of EN 71. If the impact surface is a *suction cup* it shall not become detached when tested according to 8.4.2.3 (tension test, protective components). 
- c) Helicopter rotors and single propellers intended to be powered into vertical or nearly vertical free flight by a *spring* mechanism or similar device, shall have a ring around the perimeter in order to reduce the risk of injuries.
- d) *Projectiles* with a *suction cup* as impact area shall have a length of 57 mm or more when measured as indicated in Figure 9, and with its *suction cup* on a flat surface under a force that is produced by its own mass.