

English Version

Child use and care articles - General safety guidelines - Mechanical hazards

This Technical Report was approved by CEN on 8 December 2014. It has been drawn up by the Technical Committee CEN/TC 252.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword	5
1 Scope	6
2 Mechanical hazards - Safety philosophy	6
3 Terms and definitions	6
4 Accessibility of mechanical hazards	6
4.1 General	6
4.2 Accessibility areas	7
4.3 Product information	8
5 Entrapment hazards	9
5.1 Introduction	9
5.2 Entrapment of head and neck	10
5.2.1 Rationale	10
5.2.2 Terms and definitions related to entrapment hazards	11
5.3 Requirements	12
5.4 Test equipment	12
5.4.1 Probe philosophy	12
5.4.2 Hip probe	12
5.4.3 Small head probe	13
5.4.4 Large head probe	14
5.4.5 Template for partially bound and V shaped openings	15
5.4.6 Selection and use of probes	16
5.5 Test methodology	17
5.5.1 Feet first openings	17
5.5.2 Head first openings	17
5.5.3 Partially bound, V and irregular shaped openings	17
5.6 Entrapment of fingers	19
5.6.1 Rationale	19
5.6.2 Requirements	20
5.6.3 Test equipment	20
5.6.4 Test Methodology	21
5.7 Rationale for entrapment of limbs, feet and hands	21
6 Hazards from moving parts	22
6.1 Rationale	22
6.2 General	22
6.3 Shearing hazards	22
6.3.1 Requirements	22
6.3.2 Test equipment	23
6.3.3 Test method	23
6.4 Requirements for crushing hazards	23
7 Hazards with products designed to fold for storage and transportation.	23
7.1 Rationale	23
7.2 Terms and definitions related to hazards with products designed to fold	23
7.3 Requirements	24
7.3.1 General	24
7.3.2 Unintentional release of locking mechanisms	24
7.3.3 Test methodology	24

8	Hazards related to attachment mechanisms and opening and closing systems	24
8.1	Rationale.....	24
8.2	Requirement.....	25
8.3	Test methodology.....	25
9	Entanglement hazards	25
9.1	Snagging hazards.....	25
9.1.1	Rationale.....	25
9.1.2	Requirements.....	25
9.1.3	Test Equipment.....	25
9.1.4	Test Methodology for loop and mass.....	27
9.2	Cords, ribbons and parts used as ties	28
9.2.1	Rationale.....	28
9.2.2	Requirements.....	28
9.2.3	Test methodology.....	29
9.3	Loops	29
9.3.1	Rationale.....	29
9.3.2	Requirements.....	29
9.3.3	Test methodology.....	29
10	Choking hazards.....	30
10.1	Introduction.....	30
10.2	Hazard due to small components	30
10.2.1	Rationale.....	30
10.2.2	Requirements.....	30
10.2.3	Test equipment (also used in 11.2.3).....	31
10.2.4	Test methodology (also in 11.2.4).....	33
10.3	Accessibility of filling materials.....	34
10.3.1	Rationale.....	34
10.3.2	Requirement.....	34
10.3.3	Test equipment	34
10.3.4	Test methodology.....	35
10.4	Airway obstruction	36
10.4.1	Rationale.....	36
10.4.2	Protective mechanisms of the airway	38
10.4.3	Requirements.....	38
10.4.4	Test equipment	38
10.4.5	Test methodology.....	39
11	Suffocation hazards	39
11.1	Introduction.....	39
11.2	Plastic decals and sheeting	40
11.2.1	Rationale.....	40
11.2.2	Requirements.....	40
11.2.3	Determination of hazard	40
11.2.4	Test equipment	40
11.2.5	Test methodology.....	41
11.3	Non air-permeable packaging	41
11.3.1	Rationale.....	41
11.3.2	Requirements - Packaging	42
11.3.3	Test equipment	42
11.3.4	Test methodology.....	42
12	Ingestion hazards	42
12.1	Rationale.....	42
12.2	Ingestion of small components	43
12.2.1	Requirements.....	43
12.2.2	Test equipment (Also used in 11.2.3)	43
12.2.3	Test methodology.....	45

13	Hazardous edges and projections	46
13.1	Introduction	46
13.2	Edges	46
13.2.1	Rationale	46
13.2.2	Requirements - Edges on products and components	46
13.2.3	Test methodology	47
13.3	Rigid protruding parts	47
13.3.1	Rationale	47
13.3.2	Requirements	47
13.3.3	Test methodology	47
13.4	Points and wires	47
13.4.1	Rationale	47
13.4.2	Requirement	47
14	Structural integrity	47
14.1	Introduction	47
14.2	Material suitability	48
14.2.1	Rationale	48
14.2.2	Requirements	48
14.3	Strength and durability of the product	49
14.3.1	Rationale	49
14.3.2	Requirements	49
14.3.3	Test methodology	49
15	Protective function	49
15.1	Introduction	49
15.2	Barrier function	49
15.2.1	Rationale	49
15.2.2	Requirements	50
15.2.3	Test equipment - Hip probe	50
15.2.4	Test methodology	51
15.3	Restraint systems	51
15.3.1	Rationale	51
15.3.2	Terms and definitions related to restraint systems	52
15.3.3	Requirements	52
15.3.4	Test equipment	52
15.3.5	Test methodology	53
15.4	Footholds	54
15.4.1	Rationale	54
15.4.2	Requirements	54
15.4.3	Test equipment (Templates)	55
15.4.4	Determination of a foothold	55
15.4.5	Test methodology	57
16	Hazard associated with stability	59
16.1	Rationale	59
16.2	General requirement	59
	Bibliography	60

European foreword

This document (CEN/TR 13387-3:2015) has been prepared by Technical Committee CEN/TC 252 “Child use and care articles”, the secretariat of which is held by AFNOR.

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

This document supersedes CEN/TR 13387:2004.

CEN/TR 13387 comprises the following five parts:

- Part 1: Safety philosophy and safety assessment
- Part 2: Chemical hazards
- Part 3: Mechanical hazards
- Part 4: Thermal hazards
- Part 5: Product information

CEN/TR 13387-3 should be used in conjunction with CEN/TR 13387-1.

This new edition of this Technical Report is a hazard based Technical Report. In comparison with the previous version, the main changes related to the section on Mechanical hazards are:

- Ageing and wear: Reworded;
- Accessibility of mechanical hazards: Reworded;
- Entrapment Hazards: Addition of a new finger probe and a hip probe;
- Hazards from moving parts: Moving parts separated into two main areas;
- Entanglement hazards: Improvement of the diagram for the ball and chain test; clarification of the clause for “Cords, ribbons and parts used as ties”;
- Suffocation hazards: Clarification of the clause for “Non air-permeable packaging”;
- Hazardous edges and projections: Drawings deleted;
- Protective function: Addition of a hip probe;
- Footholds: Reworded.

1 Scope

This Technical Report provides guidance information on mechanical hazards that should be taken into consideration when developing safety standards for child use and care articles. In addition, these guidelines can assist those with a general professional interest in child safety.

2 Mechanical hazards - Safety philosophy

This clause addresses the most widely known mechanical hazards and is intended to provide guidance when drafting standards for child use and care articles.

Anthropometric data and information on the abilities of children related to risks are given in Annex A of CEN/TR 13387-1:2015. When using these data for setting requirements, adequate safety margins should be considered. These data refer to static and not dynamic anthropometric data, therefore care should be taken if using these data for anything other than static situations when drafting standards.

When drafting standards, conditions of use should be considered, bearing in mind the behaviour of children. Also, it is to be considered whether the child is attended or unattended when using the product and also the child's access to hazardous features.

For each mechanical hazard a rationale is given, explaining the potential hazard to the child. Requirements, test equipment and test methods are also given. Where appropriate, these can be used when drafting standards.

3 Terms and definitions

For the purposes of this document, the following terms and definitions related to mechanical hazards apply.

3.1

mechanical hazards

physical factors which may give rise to injury due to the mechanical properties of products/product parts

3.2

reach envelopes

age related physical data on the reach limits of the limbs of children in different postures, see 4.2

3.3

ageing

change of properties of the material due to exposure to environmental factors such as temperature, humidity, UV radiation, cleaning agents etc

3.4

mechanical wear

change of mechanical properties due to fatigue or repeated operation of devices, mechanisms and other parts of the product

4 Accessibility of mechanical hazards

4.1 General

Within the mechanical section no reference is made to specific areas of access, known as access zones. It would be wrong for this guidance document to specify exact areas of access as these should be determined in relation to the hazards and risks of individual products and risks when drafting the standard. As a general guidance to the types of contact associated with mechanical hazards, the following examples are given: