

# DIN EN 71-1:2011-07 (E)

## Safety of toys - Part 1: Mechanical and physical properties

---

<b>Contents</b>		<b>Page</b>
Foreword .....		7
Introduction .....		8
<b>1</b>	<b>Scope (see A.2) .....</b>	<b>9</b>
<b>2</b>	<b>Normative references .....</b>	<b>11</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>12</b>
<b>4</b>	<b>General requirements .....</b>	<b>19</b>
4.1	Material cleanliness (see A.3) .....	19
4.2	Assembly (see A.4) .....	19
4.3	Flexible plastic sheeting (see A.5 and A.16) .....	19
4.4	Toy bags .....	20
4.5	Glass (see 5.7 and A.6) .....	20
4.6	Expanding materials (see A.7) .....	20
4.7	Edges (see A.8) .....	20
4.8	Points and metallic wires (see A.9) .....	21
4.9	Protruding parts (see A.10) .....	21
4.10	Parts moving against each other .....	22
4.10.1	Folding and sliding mechanisms (see A.11) .....	22
4.10.2	Driving mechanisms (see A.12) .....	23
4.10.3	Hinges (see A.13) .....	24
4.10.4	Springs (see A.14) .....	24
4.11	Mouth-actuated toys and other toys intended to be put in the mouth (see A.15) .....	24
4.12	Balloons (see 4.3 and A.16) .....	25
4.13	Cords of toy kites and other flying toys (see A.17) .....	25
4.14	Enclosures .....	25
4.14.1	Toys which a child can enter (see A.18) .....	25
4.14.2	Masks and helmets (see A.19) .....	26
4.15	Toys intended to bear the mass of a child (see A.20) .....	26
4.15.1	Toys propelled by a child or by other means .....	26
4.15.2	Toy bicycles (see A.20) .....	31
4.15.3	Rocking horses and similar toys (see A.21) .....	31
4.15.4	Toys not propelled by a child .....	32
4.15.5	Toy scooters (see A.49) .....	33
4.16	Heavy immobile toys .....	34
4.17	Projectiles (see A.22) .....	34
4.17.1	General .....	34
4.17.2	Projectile toys without stored energy .....	35
4.17.3	Projectile toys with stored energy .....	35
4.17.4	Bows and arrows .....	35
4.18	Aquatic toys and inflatable toys (see A.23) .....	36
4.19	Percussion caps specifically designed for use in toys and toys using percussion caps (see A.24) .....	36
4.20	Acoustics (see A.25) .....	36
4.21	Toys containing a non-electrical heat source .....	37
4.22	Small balls (see 5.10 and A.48) .....	37
4.23	Magnets (see A.51) .....	38
4.23.1	General .....	38
4.23.2	Toys other than magnetic/electrical experimental sets intended for children over 8 years	38

4.23.3	Magnetic/electrical experimental sets intended for children over 8 years .....	38
4.24	Yo-yo balls (see A.52) .....	38
4.25	Toys attached to food (see A.55) .....	39
5	Toys intended for children under 36 months .....	39
5.1	General requirements (see A.26) .....	39
5.2	Soft-filled toys and soft-filled parts of a toy (see A.27) .....	40
5.3	Plastic sheeting (see A.28) .....	41
5.4	Cords, chains and electrical cables in toys (see A.29) .....	41
5.5	Liquid-filled toys (see A.30) .....	42
5.6	Speed limitation of electrically-driven ride-on toys .....	43
5.7	Glass and porcelain (see 4.5 and A.6) .....	43
5.8	Shape and size of certain toys (see A.31) .....	43
5.9	Toys comprising monofilament fibres (see A.32) .....	43
5.10	Small balls (see also 4.22 and A.48) .....	43
5.11	Play figures .....	44
5.12	Hemispheric-shaped toys (see A.50) .....	44
5.13	Suction cups (see A.54) .....	47
5.14	Straps intended to be worn fully or partially around the neck (see A.53) .....	47
6	Packaging (see A.56) .....	47
7	Warnings, markings and instructions for use (see A.33) .....	48
7.1	General .....	49
7.2	Toys not intended for children under 36 months (see 4.22 and A.34) .....	49
7.3	Latex balloons (see 4.12 and A.16) .....	51
7.4	Aquatic toys (see 4.18 and A.23) .....	51
7.5	Functional toys (see A.35) .....	51
7.6	Hazardous sharp functional edges and points (see 4.7 and 4.8) .....	51
7.7	Projectiles (see 4.17.3 c) and 4.17.4 c)) .....	51
7.7.1	Toys with projectiles which are able to discharge an object other than that provided with the toy .....	51
7.7.2	Toys capable of discharging a projectile with a kinetic energy greater than 0,08 J .....	51
7.8	Imitation protective masks and helmets (see 4.14.2 and A.19) .....	52
7.9	Toy kites (see 4.13) .....	52
7.10	Roller skates, inline skates, skateboards and certain other ride-on toys (see 4.15.1.2 and A.20) .....	52
7.10.1	Roller skates, inline skates and skateboards .....	52
7.10.2	Ride-on toys without a braking device .....	52
7.10.3	Electrically-driven ride-on toys .....	52
7.10.4	Instructions for use .....	52
7.11	Toys intended to be attached to or strung across a cradle, cot, or perambulator (see 5.4 f)) .....	53
7.12	Liquid-filled teething (see 5.5) .....	53
7.13	Percussion caps specifically designed for use in toys (see 4.19) .....	53
7.14	Acoustics (see 4.19 and 4.20 f)) .....	53
7.15	Toy bicycles (see 4.15.2.2) .....	53
7.16	Toys intended to bear the mass of a child (see 4.10.1, 4.15.1.2, 4.15.2.2, 4.15.3 and 4.15.4) .....	54
7.17	Toys comprising monofilament fibres (see 5.9) .....	54
7.18	Toy scooters (see 4.15.5.2) .....	54
7.19	Rocking horses and similar toys (see 4.15.3 and A.21) .....	54
7.20	Magnetic/electrical experimental sets (see 4.23.3 and A.51) .....	55
7.21	Toys with electrical cables exceeding 300 mm in length (see 5.4 i)) .....	55
7.22	Toys with cords or chains intended for children of 18 months and over but under 36 months (see 5.4 b), 5.4 c) and 5.4 g)) .....	55
8	Test methods .....	55
8.1	General requirements for testing .....	55
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) .....	55
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) .....	56

8.4	Tension test (see A.37) .....	57
8.4.1	Apparatus .....	57
8.4.2	Procedure .....	57
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) .....	59
8.6	Tip over test (see 4.10.2, 4.22, 4.23.2, 5.1, 5.10, 5.12 and 5.13) .....	59
8.7	Impact 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, 5.13 and A.38) .....	60
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) .....	60
8.9	Soaking test (see 4.11, 4.23.2, 5.1, 5.10 and 5.12) .....	60
8.10	Accessibility of a part or component (see 4.5, 4.7, 4.8, 4.10.2, 4.10.4, 4.15.1.3, 4.21, 5.2 and 5.7) .....	61
8.10.1	Principle .....	61
8.10.2	Apparatus .....	61
8.10.3	Procedure .....	61
8.11	Sharpness of edges (see 4.5, 4.7, 4.9, 4.10.2, 4.14.2, 4.15.1.3 and 5.1) .....	62
8.11.1	Principle .....	62
8.11.2	Apparatus .....	63
8.11.3	Procedure .....	64
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) .....	64
8.12.1	Principle .....	64
8.12.2	Apparatus .....	64
8.12.3	Procedure .....	65
8.13	Flexibility of metallic wires (see 4.8 and A.41) .....	66
8.13.1	General .....	66
8.13.2	Metallic wires and other metallic components intended to be bent .....	66
8.13.3	Metallic wires likely to be bent .....	66
8.14	Expanding materials (see 4.6) .....	66
8.15	Leakage of liquid-filled toys (see 5.5 and A.42) .....	67
8.16	Geometric shape of certain toys (see 5.8, 5.11 and A.43) .....	67
8.17	Durability of mouth-actuated toys (see 4.11 and A.44) .....	68
8.17.1	Mouth-actuated projectile toys .....	68
8.17.2	Other mouth-actuated toys .....	68
8.18	Folding or sliding mechanisms (see 4.10.1 and A.45) .....	69
8.18.1	Loads .....	69
8.18.2	Toy pushchairs and perambulators .....	70
8.18.3	Other collapsible toys (see 4.10.1 c)) .....	70
8.19	Electric resistivity of cords (see 4.13) .....	70
8.20	Cords cross-sectional dimension (see 5.4 a)) .....	71
8.21	Static strength (see 4.15.1.3, 4.15.1.5, 4.15.3, 4.15.4 and A.46) .....	71
8.22	Dynamic strength (see 4.15.1.3) .....	72
8.22.1	Principle .....	72
8.22.2	Loads .....	72
8.22.3	Procedure .....	73
8.23	Stability .....	75
8.23.1	Toys intended to bear the mass of a child (see 4.15.1.4, 4.15.3 and 4.15.4) .....	75
8.23.2	Heavy immobile toys (see 4.16) .....	75
8.24	Determination of kinetic energy (see A.47) .....	76
8.24.1	Kinetic energy of projectiles (see 4.17.3) .....	76
8.24.2	Kinetic energy of bows and arrows (see 4.17.4) .....	76
8.25	Plastic sheeting .....	76
8.25.1	Thickness (see 4.3, 5.3 and Clause 6) .....	76
8.25.2	Adhesion (see 5.3) .....	76
8.26	Brake performance .....	77
8.26.1	Brake performance for certain ride-on toys (see 4.15.1.5) .....	77
8.26.2	Brake performance for toy bicycles (see 4.15.2.3) .....	77
8.26.3	Brake performance for toy scooters (see 4.15.5.5) .....	77
8.27	Strength of toy scooter steering tubes (see 4.15.5.3) .....	78
8.27.1	Resistance to downward forces .....	78
8.27.2	Resistance to upward forces .....	79
8.28	Determination of emission sound pressure levels (see 4.20) .....	79
8.28.1	Installation and mounting conditions .....	79
8.28.2	Measurement procedure .....	81

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) .....	86
8.30	Measurement of temperature rises (see 4.21) .....	86
8.31	Toy chest lids (see 4.14.1 c)) .....	86
8.31.1	General .....	86
8.31.2	Lid support .....	86
8.31.3	Durability test for vertically opening hinged lids .....	87
8.32	Small balls and suction cups test (see 4.17, 4.22, 4.25, 5.10 and 5.13) .....	87
8.32.1	Small balls and suction cups (see Clause 6) .....	87
8.32.2	Small balls attached to a toy by a cord .....	87
8.33	Test for play figures (see 5.11) .....	88
8.34	Tension test for magnets (see 4.23.2 and A.51) .....	88
8.34.1	General .....	88
8.34.2	Toys that contain more than one magnet or magnetic component .....	89
8.34.3	Toys that contain one magnet only .....	89
8.35	Magnetic flux index (see 4.23.2 and 4.23.3) .....	89
8.35.1	General .....	89
8.35.2	Apparatus .....	89
8.35.3	Procedure .....	90
8.35.4	Calculation of magnetic flux index .....	90
8.36	Perimeter of cords and chains (see 5.4 c) and 5.4 d)) .....	91
8.36.1	Test equipment .....	91
8.36.2	Test procedures .....	92
8.37	Yo-yo balls measurements (see 4.24) .....	96
8.37.1	Measurement of initial length $l_0$ .....	96
8.37.2	Measurement of elastic constant $k$ .....	96
8.38	Breakaway feature separation test (see 5.4 b), 5.4 c) and 5.14) .....	97
8.39	Self-retracting cords (see 5.4 e)) .....	98
8.40	Length of cords, chains and electrical cables (see 5.4 b), 5.4 c), 5.4 g), 5.4 h) and 5.4 i)) ...	98
Annex A (informative) Background and rationale for this European Standard .....		99
A.1	General .....	99
A.2	Scope (see Clause 1) .....	99
A.3	Material cleanliness (see 4.1) .....	99
A.4	Assembly (see 4.2) .....	100
A.5	Flexible plastic sheeting (see 4.3) .....	100
A.6	Glass (see 4.5 and 5.7) .....	100
A.7	Expanding materials (see 4.6) .....	100
A.8	Edges (see 4.7) .....	100
A.9	Points and metallic wires (see 4.8) .....	101
A.10	Protruding parts (see 4.9) .....	101
A.11	Folding and sliding mechanisms (see 4.10.1) .....	102
A.12	Driving mechanisms (see 4.10.2) .....	102
A.13	Hinges (see 4.10.3) .....	102
A.14	Springs (see 4.10.4) .....	103
A.15	Mouth-actuated toys and other toys intended to be put in the mouth (see 4.11) .....	103
A.16	Balloons (see 4.3, 4.12 and 7.3) .....	103
A.17	Cords of toy kites (see 4.13) .....	104
A.18	Toys which a child can enter (see 4.14.1) .....	104
A.19	Masks and helmets (see 4.14.2 and 7.8) .....	104
A.20	Toys intended to bear the mass of a child (see 4.15 and 7.10) .....	104
A.21	Rocking horses and similar toys (see 4.15.3) .....	105
A.22	Projectiles (see 4.17) .....	106
A.23	Aquatic toys and inflatable toys (see 4.18 and 7.4) .....	106
A.24	Percussion caps specifically designed for use in toys and toys using percussion caps (see 4.19) .....	106
A.25	Acoustics (see 4.20) .....	107
A.26	General requirements for toys intended for children under 36 months (see 5.1) .....	107
A.27	Soft-filled toys and soft-filled parts of a toy (see 5.2) .....	108
A.28	Adhesion of plastic sheeting (see 5.3) .....	108
A.29	Cords and chains in toys (see 5.4) .....	108

<b>A.30</b>	<b>Liquid-filled toys (see 5.5 and A.42)</b> .....	<b>110</b>
<b>A.31</b>	<b>Shape and size of certain toys (see 5.8 and A.43)</b> .....	<b>111</b>
<b>A.32</b>	<b>Toys comprising monofilament fibres (see 5.9)</b> .....	<b>111</b>
<b>A.33</b>	<b>Warnings, markings and instructions for use (see 7.1)</b> .....	<b>111</b>
<b>A.34</b>	<b>Warning for toys not intended for children under 36 months (see 7.2)</b> .....	<b>111</b>
<b>A.35</b>	<b>Warnings in connection with functional toys (see 7.5)</b> .....	<b>111</b>
<b>A.36</b>	<b>Small parts cylinder (see 8.2)</b> .....	<b>112</b>
<b>A.37</b>	<b>Tension test (see 8.4)</b> .....	<b>112</b>
<b>A.38</b>	<b>Impact test (see 8.7)</b> .....	<b>112</b>
<b>A.39</b>	<b>Compression test (see 8.8)</b> .....	<b>112</b>
<b>A.40</b>	<b>Sharpness of points (see 8.12)</b> .....	<b>112</b>
<b>A.41</b>	<b>Flexibility of metallic wires (see 8.13)</b> .....	<b>112</b>
<b>A.42</b>	<b>Leakage of liquid-filled teething toys (see 8.15 and A.30)</b> .....	<b>112</b>
<b>A.43</b>	<b>Geometric shape of certain toys (see 8.16 and A.31)</b> .....	<b>113</b>
<b>A.44</b>	<b>Durability of mouth-actuated toys (see 8.17)</b> .....	<b>113</b>
<b>A.45</b>	<b>Folding or sliding mechanisms (see 8.18)</b> .....	<b>113</b>
<b>A.46</b>	<b>Static strength (see 8.21)</b> .....	<b>113</b>
<b>A.47</b>	<b>Kinetic energy of projectiles, bows and arrows (see 8.24)</b> .....	<b>113</b>
<b>A.48</b>	<b>Small balls (see 4.22 and 5.10)</b> .....	<b>113</b>
<b>A.49</b>	<b>Toy scooters (see 4.15.5)</b> .....	<b>115</b>
<b>A.50</b>	<b>Hemispheric-shaped toys (see 5.12)</b> .....	<b>115</b>
<b>A.51</b>	<b>Magnets (see 4.23)</b> .....	<b>115</b>
<b>A.52</b>	<b>Yo-yo balls (see 4.24)</b> .....	<b>117</b>
<b>A.53</b>	<b>Straps intended to be worn fully or partially around the neck (see 5.14)</b> .....	<b>121</b>
<b>A.54</b>	<b>Suction cups (see 5.13)</b> .....	<b>121</b>
<b>A.55</b>	<b>Toys attached to food (see 4.25)</b> .....	<b>121</b>
<b>A.56</b>	<b>Packaging (see Clause 6)</b> .....	<b>121</b>
<b>Annex B (informative) Significant technical changes between this European Standard and the previous version</b> .....		<b>124</b>
<b>Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives</b> .....		<b>126</b>
<b>Bibliography</b> .....		<b>128</b>