Adjust the point tester (5.9.2.1) by loosening the locking ring and rotating it so that it moves toward the indicator lamp assembly a sufficient distance to expose the calibration reference mark on the barrel. Rotate the gauging cap clockwise until the indicator lamp lights. Rotate the cap anticlockwise until the sensing head moves a distance of (0,12 ± 0,02) mm from making contact with the dry cell, as shown in Figure 23.

NOTE Where the gauging cap includes micrometer markings, the distance can be readily achieved by rotating the cap anticlockwise until the appropriate micrometer marking corresponds with the calibration reference mark. The gauging cap can now be locked in this position by rotating the locking ring until it fits firmly against the cap.

Insert the point, in the most onerous direction, into the cap slot and apply a force of $\left(4{,}5\ _{-0{,}2}^{\ 0}\right)\text{N}$ to depress the spring as far as possible without shaving the point on the edges of the slot or extruding the point through the slot. If the point being tested penetrates a distance of 0,5 mm or more into the gauging slot, causing the indicator lamp to light, and the point under test maintains its original shape while under a force of $\left(4{,}5\ _{-0{,}2}^{\ 0}\right)\text{N}$, the test point is a potentially hazardous sharp point.

5.10 Determination of thickness of plastic film and sheeting

5.10.1 General

See 4.10.

Prepare plastic bags by cutting the sides, without stretching, into two single sheets.

5.10.2 Apparatus

A measuring device capable of measuring thickness to an accuracy of 4 µm with plane upper and lower measuring surfaces having a diameter of (6 ± 1) mm that are parallel to within 5 µm and have polished surfaces, and which applies a compression force of (0,75 ± 0,25) N.

5.10.3 Procedure

Condition the specimen for at least 1 h at (21 ± 5) °C.

Ensure that the specimens and the faces of the measuring device are free from contamination (e.g. dust).

Check the zero point of the measuring device before starting the measurements and recheck after each series of measurements.

When determining the thickness, lower the foot gently to avoid deforming the material.

Measure the thickness of any sheet at 10 equidistant points across the diagonal of any 100 mm × 100 mm area.

Determine whether the thickness complies with the requirements of 4.10 a).

5.11 Test for cords

5.11.1 Determination of cord thickness

See 4.11.1.

Tension the cord under test with a force of (25 ± 2) N.

Measure the thickness of the cord at three to five locations along its length with a suitable device having an accuracy of ± 0,1 mm. For cords approaching 1,5 mm in thickness, use a non-compressible method, e.g. an optical projector.

Calculate the mean thickness of the cord.

Determine whether the thickness complies with the requirements of 4.11.1.

5.11.2 Self-retracting pull cords

See 4.11.2.

Using a suitable clamp, position the toy so that the cord is vertical and the toy is in the most favourable position for retraction. Extend the cord fully and attach a mass of $\left(0{,}9\ ^{+0{,}05}_{\ \ 0{,}0}\right)\text{kg}$.

For monofilament cords less than 2 mm in diameter, attach a mass of $\left(0{,}45\ ^{+0{,}05}_{\ \ 0{,}0}\right)\text{kg}$.

Determine whether the cord retracts more than 6,4 mm.

5.11.3 Electric resistance of cords

See 4.11.7.

Condition the samples for 7 h minimum at a temperature of (25 ± 3) °C and at a relative humidity of 50 % to 65 % and carry out the test in this atmosphere.

Using an appropriate appliance, determine whether the electric resistance is more than 10^8 Ω/cm.

5.12 Stability and overload tests

See 4.15.

5.12.1 General

Where the toy is intended to bear the mass of more than one child at a time, test each sitting or standing area simultaneously.

5.12.2 Sideways stability test, feet available for stabilization

See 4.15.1.1 and 4.29.4.

Place the toy on a smooth surface inclined $\left(10\ ^{+0{,}5}_{\ \ 0{,}0}\right)^{\circ}$ to the horizontal plane.

Position the toy on the inclined surface so that it is facing in a direction that would most likely cause it to tip sideways. Turn the steering mechanism, if any, to the most onerous position. Chock wheels to restrict rolling, but allow casters to assume their natural position before chocks are applied.

Load the toy on its standing or sitting surface with the appropriate mass in accordance with Table 2.

Table 2 — Loads for stability test

Age group	Load kg
Under 36 months	25 ± 0,2
36 months and over	50 ± 0,5

Apply the load so that the major axis is perpendicular to the true horizontal while the toy is on the specified incline. Design the load so that the height of its centre of gravity is (220 ± 10) mm above the seat surface. For toy scooters, however, use a test load with dimensions as specified in Figure 30. For all ride-on toys, secure the centre of gravity of the load both (43 ± 3) mm rearward of the front-most portion of the designated seating area, and (43 ± 3) mm forward of the rear-most portion of the designated seating area.

NOTE This involves two separate tests.

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.

Observe whether the toy tips over within 1 min after application of the load.

5.12.3 Sideways stability test, feet unavailable for stabilization

See 4.15.1.2.

Perform the test in accordance with 5.12.2 (stability test, feet available for stabilization) except that the slope shall be inclined $\left(15\,^{+0,5}_{\;\;0,0}\right)^{\circ}$ to the horizontal plane.

Observe whether the toy tips over within 1 min after application of the load.

5.12.4 Fore and aft stability test

See 4.15.1.3.

Ride-on toys shall be tested with the steering mechanism, if any, in the position where the toy is most likely to tip.

For rocking horses, displace the toy to the limit of its bow.

Place the toy on a slope of a smooth surface inclined $\left(15\,^{+0,5}_{\;\;0,0}\right)^{\circ}$ to the horizontal plane. Test the toy facing both up and down the slope.

Load the toy as specified in 5.12.2.

Observe whether the toy tips over within 1 min after application of the load.

5.12.5 Overload test for ride-on toys and seats

See 4.15.2.

Place the toy on a horizontal plane.

Load the toy on its standing or sitting surface with the appropriate mass in accordance with Table 3.

Table 3 — Loads for overload test

Age group	Load kg
Under 36 months	35 ± 0,3
36 months and over but under 96 months	80 ± 1,0
96 months and over	140 ± 2,0

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 3.

Determine whether the toy collapses such that it does not conform to the relevant requirements.

5.12.6 Stability test of stationary floor toys

See 4.15.3.

Place the toy on a smooth surface inclined (10 ± 1)° to the horizontal plane. Position the toy on the inclined surface such that it is facing in a direction that would most likely cause it to tip. Adjust any movable portions to the most onerous position, e.g. drawers fully drawn out or fully pushed in, whichever is more onerous.

Observe whether the toy tips over within 1 min.

5.13 Test for closures and toy chest lids

See 4.16.2.

5.13.1 Closures

With the closure in a closed position, apply a force of (45 ± 1,3) N in an outward direction to the inside of the closure perpendicular to the plane of the closure and anywhere within 25 mm from the geometric centre of the closure.

Observe whether the closure opens.

5.13.2 Toy chest lids

Before testing the toy chest lid (see 4.16.2), assemble the toy chest in accordance with the manufacturer's instructions.

5.13.2.1 Lid support

Lift the lid to any position in its arc of travel to a distance greater than 50 mm, but not through an arc of more than 60° from its fully closed position, as measured at the outermost edge of the lid. Release the lid and measure any dropping motion at a point in the approximate centre of the outermost edge of the lid.

Determine whether the lid drops more than 12 mm (see 4.16.2).

5.13.2.2 Durability test for toy chest lids

Subject the lid to 7 000 opening-and-closing cycles, where one cycle consists of raising the lid from its fully closed to its fully open position and returning it to fully closed. To prevent undue stress on screws or other fasteners used to attach the lid support mechanism, care should be taken not to force the lid beyond its normal arc of travel.

The time to complete one cycle shall be approximately 15 s. The 7 000 cycles shall be completed within a time period of 72 h, after which the test described in 5.13.2.1 shall be repeated.

Determine whether the toy chest lid and the lid support mechanism still comply with the requirements of 4.16.2.2.

5.14 Impact test for toys that cover the face

See 4.17.

Affix the toy firmly in a suitable clamp with that portion which covers or, in the case of cut-out eye holes, which surrounds the eyes, in a horizontal plane.

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 onto the horizontal upper surface of the toy in the area that would cover the eyes in normal use.

The ball may be guided but not restricted in its fall by being dropped through a perforated tube extending to within approximately 100 mm of the toy.

Determine whether the toy has produced hazardous sharp edges, hazardous sharp points or loose parts which could enter the eye.

5.15 Kinetic energy of projectiles, bows and arrows

See 4.18.

5.15.1 Principle

Calculate the kinetic energy of the projectile, used under normal conditions, from the maximum of five velocity readings.

If more than one type of projectile is supplied with the toy, the kinetic energy of each type of projectile shall be calculated.

For bows, use an arrow intended for the bow and stretch the bow string as far as the arrow allows, but to a maximum of 70 cm.

5.15.2 Apparatus

5.15.2.1 Means for determining the velocity, capable of giving a calculated kinetic energy to an accuracy of 0,005 J.

5.15.3 Procedure

5.15.3.1 Determination of kinetic energy

Determine the maximum kinetic energy, E_k, of the projectile in free flight using Formula (1):

$$E_\mathrm{k} = mv^2/2 \tag{1}$$

where

m is the mass of the projectile, in kilograms;

v is the velocity of the projectile, in metres per second;

E_k is the maximum kinetic energy, in joules.

5.15.3.2 Determination of kinetic energy per area of contact

Determine the maximum kinetic energy per area of contact, $E_\mathrm{k,\ area}$, using Formula (2):

$$E_\mathrm{k,\ area} = mv^2/2A \tag{2}$$

where

m is the mass of the projectile, in kilograms;

v is the velocity of the projectile, in metres per second;

A is the impact area of the projectile, in square centimetres;

$E_\mathrm{k,\ area}$ is the maximum kinetic energy per area of contact, in joules per square centimetre.

An acceptable method of determining the contact area of a resilient-tipped projectile is to apply a suitable staining or inking agent (e.g. Prussian blue) to the projectile, firing it at a suitable perpendicular surface (300 ± 5) mm away and measuring the area of residual impression. Conversely, if more appropriate, the impact surface may be impressionable (e.g. covered with a carbon paper system) rather than the projectile. Determine the impact area as follows.

a) Apply a suitable staining or inking agent to the tip of the projectile. Place a sheet of clean white paper on a wooden block. Support the block so it will not move when impacted.

   Hold the sheet flat against the block or place a sheet of clean white paper between the wooden block and a sheet of carbon paper (carbon side facing the white paper). Hold the sheets flat against the block.

b) Load the projectile to be tested into the discharge mechanism. Orientate the loaded discharge mechanism perpendicular to the block surface, with the tip of the projectile (300 ± 5) mm from the block. If the discharge mechanism has more than one speed setting, set to the maximum speed.

c) Propel the projectile into the paper.

d) Measure the image area on the white paper. The impact area is the average of a minimum of five measurements.

e) Calculate the maximum kinetic energy per area of contact.

5.16 Free-wheeling facility and brake performance test

5.16.1 Determination of free-wheeling facility

See 4.20 and 4.21.3.

To determine free-wheeling facility, load the toy as in 5.12.2 (stability test, feet available for stabilization) with the appropriate mass as given in Table 2 and place it on a horizontal plane.

Pull the toy at a constant speed of (2 ± 0,2) m/s on a surface covered with aluminium oxide paper P60 and determine the maximum pull force, F.

The toy is not free-wheeling if [using Formula (3) or Formula (4)]:

$$F_1 \geq (m + 25) \times 1{,}7 \tag{3}$$

or

$$F_2 \geq (m + 50) \times 1{,}7 \tag{4}$$

where

F_1 is the maximum pull force, in newtons, for a toy intended for children under 36 months;

F_2 is the maximum pull force, in newtons, for a toy intended for children 36 months and over;

m is the mass of the toy, in kilograms.

NOTE 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.

5.16.2 Brake performance for mechanically or electrically powered ride-on toys other than toy bicycles

See 4.20.

Load the toy as in 5.12.2 (stability test, feet available for stabilization) with the appropriate mass as given in Table 2 and place it on a plane inclined at $\left(10^{+0,5}_{\ 0}\right)^{\circ}$ covered with a surface of aluminium oxide paper P60, with its longitudinal axis parallel to the incline.

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.

If the vehicle has several brakes, test each brake separately.

Determine whether the toy moves more than 5 cm upon application of the braking force.

5.16.3 Brake performance for toy bicycles

See 4.21.3.

Load the toy bicycle with a mass of (50 ± 0,5) kg, whose centre of gravity is 150 mm above the surface on which a child sits. Place the toy bicycle on a plane inclined at $\left(10^{+0,5}_{\ 0}\right)^{\circ}$ with its longitudinal axis parallel to the incline.

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 in the operating direction producing the effect of the brake.

Determine whether the toy moves more than 5 cm upon application of the braking force.

5.17 Determination of speed of electrically driven ride-on toys

See 4.22.

Load the toy in its normal sitting or standing position with a mass of (25 ± 0,2) kg.

Operate the toy on a horizontal surface and determine whether the maximum velocity exceeds 8 km/h.

5.18 Determination of temperature increases

See 4.23.

In an ambient draft-free atmosphere with a temperature of (21 ± 5) °C, operate the toy according to the instructions for use at the maximum input until equilibrium temperature is reached.

Measure the temperature of the accessible parts and calculate the temperature increases.

Observe whether the toy ignites.

5.19 Leakage of liquid-filled toys

See 4.24.

Condition the liquid-filled toy at a temperature of (37 ± 1) °C for a minimum of 4 h.

Within 30 s of removing the toy from conditioning, apply a force of $\left(5\ ^{+0,5}_{\ 0}\right)$N to the external surface of the toy through a steel needle with a diameter of (1 ± 0,1) mm and with a tip radius of (0,5 ± 0,05) mm.

Apply the force gradually within a period of 5 s. Maintain the force for 5 s.

After completion, determine leakage by applying cobalt chloride paper over the area where the force was applied while elsewhere compressing with a force of $\left(5\ ^{+0,5}_{\ 0}\right)$N using suitable means other than a needle.

Repeat the test after conditioning the toy at a temperature of (5 ± 1) °C for a minimum of 4 h.

After completion, examine the toy for leakage of the contents.

If liquid other than water is used, confirm leakage using another suitable method.

Cobalt chloride paper should not be used for the 5 °C test as condensation may give false results.

5.20 Durability of mouth-actuated toys

See 4.25.

Connect a piston pump capable of discharging and receiving more than 300 cm^3 of air in less than 3 s to the mouthpiece of the mouth-actuated toy. Arrange a relief valve so that the pump will not generate a positive or negative pressure of more than 13,8 kPa. 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. If the air outlet is accessible, ensure that the above is also applied to the outlet.

Determine whether any released component fits entirely in the cylinder when tested in accordance with 5.2 (small parts test).

5.21 Expanding materials

See 4.3.2.

Condition the toy or component at (21 ± 5) °C and at a relative humidity of 40 % to 65 % for at least 7 h before the test. Measure the maximum dimensions x, y, and z of the toy or any component of the toy using callipers.

Submerge the toy or component completely in a container of demineralized water at (20 ± 5) °C for (24 ± 0,5) h. Ensure that sufficient water is used so that the toy or component still remains under water at the end of the test.

Remove the item using a pair of tongs. If the item cannot be removed because of insufficient mechanical strength, it is considered to comply with the requirement of 4.3.2.

Allow water adhering to the toy or component to drain for 1 min and re-measure the item.

After re-measuring, place the item in the demineralized water again and repeat the above procedure twice, such that the item has been measured after 24 h, 48 h and 72 h of submersion.

Calculate the expansion in the x, y and z dimensions as a percentage of the original dimension.

Determine whether the item complies with the requirements of 4.3.2.

5.22 Folding or sliding mechanisms

5.22.1 Loads

Load the toy with a mass of (50 ± 0,5) kg.

For toys intended for children under 36 months, load the toy with a mass of (25 ± 0,2) kg.

5.22.2 Toy pushchairs and perambulators

See 4.12.1.

Precondition the toy by erecting and folding it 10 times.

a) For toy pushchairs and perambulators covered by 4.12.1 a), carry out the following.

   Erect the toy on a horizontal surface with the locking devices engaged and load the toy with the appropriate mass specified in 5.22.1, ensuring that the load is borne by the frame. Where necessary, use a suitable support to ensure that the seat material is not damaged. Apply the load to the frame in the least favourable position with respect to the folding parts. Apply the load evenly over 5 s and maintain for 5 min.

   Determine whether it is possible to partially erect the toy without engaging one of the locking devices. If so, also carry out the above loading in the partially erect position.

   If the seat of the body is detachable from the chassis, this test shall also be carried out on the chassis only, using suitable support for the test mass.

   Determine whether the toy collapses and whether the locking devices are still operable and engaged.

b) For toy pushchairs and perambulators covered by 4.12.1 b), carry out the following.

   Erect the toy on a horizontal surface with the locking devices engaged and load the toy with the appropriate mass specified in 5.22.1 ensuring that the load is borne by the frame. Where necessary, use a suitable support to ensure that the seat material is not damaged. Apply the load to the frame in the most onerous position with respect to the folding parts. Apply the load evenly over 5 s and maintain for 5 min.

Determine whether it is possible to partially erect the toy without engaging the locking devices. If so, also carry out the above loading in the partially erect position.

Determine whether the toy collapses and whether the locking devices or safety stop are still operable and engaged.

5.22.3 Other toys with folding mechanisms

See 4.12.2.

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.

b) Erect the toy and position it on a surface inclined $\left(10\,^{+0,5}_{\;\;0}\right)^{\circ}$ in the most onerous position with respect to the folding parts. Engage any locking device. Load the toy for 5 min with the appropriate mass specified in 5.22.1. Apply the load wherever it is possible for a child to sit and in the least favourable position with respect to the folding parts. Ensure that the load is borne by the frame. Where necessary, use a suitable support to ensure that the seat material is not damaged.

Determine whether the toy collapses or the locking device disengages.

5.23 Washable toys

See 4.1.

Determine the mass of each washable toy prior to the beginning of the test.

Subject the toy to six washing-machine and tumble-dryer cycles, unless a different method is specified by the toy manufacturer by means of a permanent label.

Any commercially available washer, dryer or laundry detergent intended for use in the home may be used for this test. Consideration should be given to the specific types of washing machines (top- or front-loading) used in the country in which the toy is meant to be sold.

Wash the toys plus a dummy load of clothes sufficient to bring the total dry mass to a minimum 1,8 kg in an automatic washing machine, using the “warm” water setting and approximately 12 min wash cycle at the “normal” setting.

Dry the toys and dummy load in accordance with the manufacturer’s instructions.

NOTE For equivalent settings on other types of machines, “warm” is approximately 40 °C and a “normal” load is for an average size load according to the machine being used.

The toy shall be deemed to be dry when the final mass does not exceed the original dry mass by more than 10 %.

Determine whether the toy still conforms to the relevant requirements of Clause 4.

5.24 Reasonably foreseeable abuse tests

See 4.2.

5.24.1 General

The tests in 5.24 are meant to simulate situations in which possible damage can occur to a toy as a result of reasonably foreseeable abuse.

Unless otherwise stated, these tests are only applicable for toys intended for children under 96 months.

After undergoing each of the appropriate tests, the toy shall still continue to conform to the relevant requirements of Clause 4.

NOTE The tests specified in 4.30.2 are carried out in the order specified in 4.30.2 on a toy, or part of a toy, that has not been previously tested according to this subclause (5.24).

5.24.2 Drop test

Except for toys covered in 5.24.3 (tip-over test for large and bulky toys), toys falling below the mass limits indicated in Table 4 shall be dropped onto a specified impact surface. The number of times the toy shall be dropped and the height from which it is dropped shall also be determined from Table 4. The toy shall be dropped in random orientation.

The impact surface shall consist of vinyl composition tile of approximately 3 mm nominal thickness laid over concrete of at least 64 mm thickness. The tile shall have a hardness of (80 ± 10) Shore A and the impact surface shall be at least 0,3 m2.

For battery-operated toys, the recommended batteries shall be in place during the drop test. If no specific type of battery is recommended, the heaviest battery which is generally available shall be used.

Table 4 — Drop test

Age group	Mass criterion kg	Number of drops	Drop height cm
Under 18 months	< 1,4	10	138 ± 5
18 months and over but under 96 months	< 4,5	4	93 ± 5

After each drop, the toy shall be allowed to come to rest and shall be examined and evaluated before continuing.

Determine whether the toy continues to conform to the relevant requirements of Clause 4.

5.24.3 Tip-over test for large and bulky toys

Large and bulky toys shall not be tested according to 5.24.2 (drop test), but in accordance with the following procedure:

Tip the toy over three times, one of which shall be in the most onerous position, by pushing the toy slowly past its centre of balance onto the impact surface described in 5.24.2 (drop test).

After each tip-over, the toy shall be allowed to come to rest and shall be examined and evaluated before continuing.

Determine whether the toy continues to conform to the relevant requirements of Clause 4.

5.24.4 Dynamic strength test for wheeled ride-on toys other than toy scooters

Load the toy for 5 min in the most onerous position with the appropriate mass in accordance with Table 2 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 (2 ± 0,2) m/s into a non-resilient step with a height of 50 mm.

If the toy is intended to bear the mass of more than one child at a time, test each sitting or standing area simultaneously.

Determine whether the toy continues to conform to the relevant requirements of Clause 4.