

Unofficial Translation

Ministerial Notification

No. B.E. 2540 (1997)

Persuant to the Industrial Product Standards Act

B.E. 2511 (1968)

on Amendment to the Thai Industrial Standard for Toys Part 3 (Amendment No. 1)

Whereas it is expedient to revise the Thai Industrial Standard (TIS) 685 Part 3 - 2530 (1987),

By virtue of Section 15 of the Industrial Product Standards Act B.E. 2511 (1968), the Minister of Industry issues the Notification concerning amendment to the Thai Industrial Standard for Toys Part 3 attached to the Ministerial Notification No. (B.E. 25....) dated as follows :

1. The number of this standard should be amended from “ TIS 685 Part 3 - 2530 ” to “ TIS 685 Part 3 - 2540 ”.
2. Clauses 3.2.1, Table 1, Columns 4 and 10, “ 3.6 ” should be amended to “ 5.6 ” and “ ± 0.1 ” should be amended to “ ± 0.1 except for f and g which have a tolerance ± 1 ”.
3. Clauses 3.6.3.1 should be withdrawn and replaced by the following
“3.6.3.1 In the case of driving mechanisms, examine whether the test sample is still operable and whether the driving mechanisms have become detached.
4. Clause 3.10.2, “ 150 mm ” should be amended to “ 50 mm ” and “ 2 m per second ” should be amended to “ 2 m per second ± 0.2 m per second ”.
5. Clause 3.16 and Table 3 should be withdrawn and replaced by the following
“3.16 Tensile strength
3.16.1 Tensile strength for non-detachable components
Apply a tension load perpendicularly and parallel to the major axis for not less than 5 s and maintain the force for 10 s. Examine the components.
3.16.2 Tensile strength for seams
Attach the clamps to the cover material of test sample in such a manner that the outside diameter of the 19 mm washer at a point nearest the seams shall be close to, but no closer than 13 mm from the edge of the seam stitching thread. Apply a force of $70 \text{ N} \pm 2 \text{ N}$ gradually for not less than 5 s. Maintain the force for 10 s. Examine the seams and the material adjacent to the seam of the test sample.
In the case where the test sample is so small that a clamp cannot be attached to, the tensile test according to Clause

- 3.16.1 should be performed by applying a force of $70 \text{ N} \pm 2 \text{ N}$.
- 3.16.3 Tensile strength for protective materials or magnetic materials
Apply a force of $70 \text{ N} \pm 2 \text{ N}$ to the protective materials or magnetic materials for not less than 5 s. Maintain the force for 10 s. Examine whether the protective materials or magnetic materials have become detached, then carry out sharpness of edges and sharpness of point tests according to Clauses 3.3 and 3.4.
6. Clause 3.19 should be withdrawn and replaced by the following
- “3.19 Expansion of materials in the water
- 3.19.1 Test specimens
Remove a seed or other rattling materials from the test specimen. Condition the test specimen at $21 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ and at relative humidity of $65 \pm 5 \%$ for 7 hours.
- 3.19.2 Procedures
Measure the dimensions of the test samples in the X, Y and Z directions. Submerge the test samples in a container of demineralised water at $21 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ for $24 \text{ hours} \pm 0.5 \text{ hours}$. Allow excess water to drain and remeasure the item.
- 3.19.3 Reporting
Calculate the average expansion in the X, Y and Z dimensions as percentage of the original measurement
7. Clause 3.20.1.2, “ 50 cm^2 ” should be amended to “ with the diameter of $80 \text{ mm} \pm 2 \text{ mm}$ ” and “ a total mass of 1 kg ” should be amended to “ the mass of $1 \text{ kg} \pm 0.02 \text{ kg}$ ”.
8. Clause 3.20.2, “ 100 mm ” should be amended to “ $100 \pm 2 \text{ mm}$ ”.
9. Clause 3.24.4.1, “ Masks ” should be amended to “ Masks and some parts of masks with hair protruding less than 50 mm , or without hair ”.
10. Clause 3.24.1.2 should be withdrawn and replaced by the following
- “3.24.1.2 A gas burner capable of adjusting a flame height and to be in accordance with ISO 6941”.
11. Clause 3.24.4.1 (1), “ Move the gas burner to an angle of 45 ° , adjust the flame height to 20 mm ” to “ Adjust the flame height to $20 \text{ mm} \pm 2 \text{ mm}$, move the gas burner to an angle of 45 ° ”.
12. Clause 3.24.4.2, “ Masks and other materials with pile of hair element longer than 50 mm ” should be amended to “ and masks with fluffy pile of hair element longer than 50 mm ”.
13. Clause 3.24.4.2(3), “ 20 mm ” should be amended to “ $20 \text{ mm} \pm 2 \text{ mm}$ ”.

14. Clause 3.24.4.3 (1) should be withdrawn and replaced by the following
“3.24.4.3 (1) Position the test sample vertically with the head uppermost. In the case where more than one orientation is possible, the most onerous position should be chosen. Carry out the test according to Clause 3.24.4. with the distance between the edge of the burner tube and the sample of approximately 5 mm so that the flame makes contact at least 20 mm above the lower edge of the sample for 3 s.”

15. Clauses 3.25 to 3.29 should be withdrawn and replaced by the following
“3.25 Chemical characteristics
Analysis of migration of heavy metals extracted from paints, coatings, writing materials, plastics, paper and paper board, finger paints and modelling clay should be in accordance with ISO 8124 -3.

3.26 Projectiles of projectile toys or projectile firing toys

3.26.1 Kinetic energy

3.26.1.1 Weigh the test specimen (m).

3.26.1.2 Measure the velocity of the test sample by dropping the test sample from equipment at a certain distance. Take 5 measurements and calculate the average velocity.

3.26.1.3 The kinetic energy of a projectile is determined from the equation :

$$\text{Kinetic energy Joule} = \frac{1}{2} mv^2$$

where m is the mass of the test specimen in kilograms

v is the average velocity of the test sample in meter per second

3.26.2 Kinetic energy density

3.26.2.1 Mark the surface area of the test sample with printing ink.

3.26.2.2 Measure the kinetic energy of the test specimen by on the concrete blocks or other appropriate materials which are 300 mm from the firing point or other appropriate materials.

3.26.2.3 Measure the impact area on concrete blocks

3.26.2.4 The kinetic energy density is determined from the equation :

$$\text{Kinetic energy density} = \frac{\text{Kinetic energy}}{\text{Impact area}}$$

- 3.26.2.5 Repeat these procedures twice and calculate the average kinetic energy as Joule per cm².
- 3.27 Shape and size of rattles or teething toys
 - 3.27.1 Position and clamp the test templates A and B (see figures 6 and 7) so that the axis of the slot is vertical and the slot is unobstructed at its top and bottom openings.
 - 3.27.2 Orientate the toy to be tested in a position which would most likely permit the entry of the toy through the slot in the test template. Place the toy in the slot so that the force on the toy is only the force due to its mass. Observe whether the toy passes through the slot or whether any part of the toy protrudes past the base of the templates A and B.
- 3.28 Leakage of liquid filled toys
 - 3.28.1 Condition the test specimen at a temperature of $37 \pm 1^\circ \text{C}$ for not less than 4 hours.
 - 3.28.2 Within 30 seconds of removing the toy from conditioning, apply a force of $5\text{N} + 0.5 \text{N}$ to the external surface of the toy through a steel needle with a diameter of $1 \text{ mm} \pm 0.1 \text{ mm}$ and with a diameter of $1 \text{ mm} \pm 0.1 \text{ mm}$ with a tip radius of $0.5 \text{ mm} \pm 0.05 \text{ mm}$. Apply the force gradually within a period of 5 s. Maintain the force for 5 s.
 - 3.28.3 Examine the test specimen for leakage of the contents by applying cobalt chloride paper over the area where the force was applied whilst elsewhere compressing with a force of $5\text{N} + 0.5 \text{N}$ using suitable means other than a needle.
 - 3.28.4 Condition the same test specimen which has passed the test at a temperature of $5^\circ \text{C} \pm 1^\circ \text{C}$ for not less than 4 hours.
 - 3.28.5 Repeat the test in Clauses 3.28.2 and 3.28.3.

As from

On

Minister of Industry

Thai Industrial Standard
for
Toys
Part 3 : Methods of Test and Analysis

1. Scope

- 1.2.1 This standard specifies testing and analysis of toys covered in the scope of TIS 685, "Toys", Part 1: "General requirements".

2. Definitions

- 2.1 For the purpose of this standard, the definitions given in TIS 685 Part 1 shall apply.

3. Testing and analysis

3.1 Combustion on textile materials

3.1.1 Apparatus

3.1.1.1 A specimen holder shall be a metal open frame approximately 100×100 mm, with cover plate.

3.1.1.2 A gas burner capable of adjusting the flame height and the flame size

3.1.2 Test specimens

The test specimen shall be cut from fabrics approximately 100×100 mm and shall be free from wrinkles, creases and seams.

3.1.3 Procedure

3.1.3.1 Light the gas burner and adjust the flame to a diameter of 0.2 mm and a height of 16 mm.

3.1.3.2 Clamp a test specimen in the holder and place the test specimen horizontally with its center at 8 mm from the flame for 1 s. Then remove the gas burner and immediately record the time setting.

3.1.3.3 Examine the flame on the test specimen. It should be self-extinguished within 5 s after removal of the gas burner. In case the flame continues to glow, an appropriate material shall be used to extinguish the flame immediately after 5 s. Measure the burning area of the test specimen.

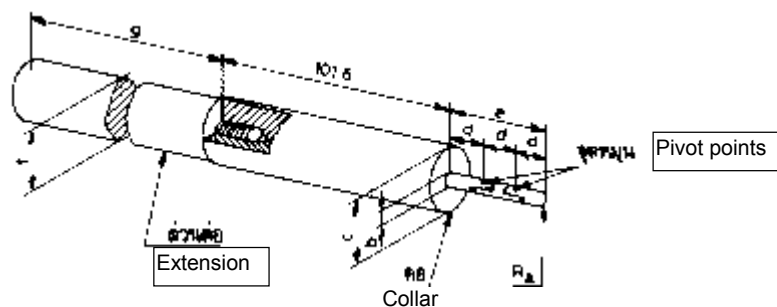
3.1.4 Report

Report the self-extinguished time of the flame expressed in seconds or the size of the burning area for 5 s after removal of the gas burner.

3.2 Accessibility of a part or component of a toy

3.2.1 Apparatus

The test probe shall have a shape, a type and a dimension as specified in Figure 1 and Table 1.



Units in millimetres

Figure 1 Shape and dimension of accessibility probe
(clause 3.2.1)

Table 1
Type and dimension of accessibility probe
(clause 3.2.1)

Sample	Type of probe	Ra	b	c	d	e	f	g	Tolerance Max
Toy intended for a child aged less than 3 years	A	2.8	3.6	25.9	14.7	44.0	25.4	464.3	± 0.1
Toy intended for a child aged over 3 years	B	4.3	8.6	38.4	19.3	57.9	38.1	451.6	

3.2.2 Test specimens

3.2.2.1 Toys without parts or components

The test specimen shall be the whole toy.

3.2.2.2 Toys with parts on components designed to be removed without the use of a tool.

The test specimen shall be each part or component of the toys removed without the use of the tool.

3.2.2.3 Toys with parts or components having an instrument or a tool intended for assembling or dismantling of the toys.

The test specimen shall be each part or component of the toys that are capable of being removed by that instrument or tool.

3.2.3 Procedure

Insert the appropriate accessibility probe as specified in Table 1, in any convenient attitude, towards the part or component of the toy being tested or the probe may be rotated up to 90° to simulate knuckle movement in the attempt to contact the part or component of the toy.

3.2.3.1 For any hole, recess, or other opening having a minor dimension (the diameter of the largest sphere that will pass through the opening) smaller than the collar diameter of the appropriate probe, insert the probe such that the total insertion depth for accessibility is up to the collar.

3.2.3.2 For any hole, recess, or other opening having a minor dimension larger than the collar diameter of probe A but less than 187 mm when probe A is used, or a minor dimension larger than the collar diameter of probe B but less than 230 mm when probe B is used, determine the total insertion depth for accessibility by inserting the appropriate probe, with the extension shown in Figure 1 in any direction for up to 2.25 times the minor dimension of the hole, recess, or opening, measured from any point in the plane of the opening.

3.2.3.3 For any hole, recess, or other opening having a minor dimension of 187 mm or larger when probe A is used, or a minor dimension of 230 mm or larger when probe B is used, the total insertion depth for accessibility is unrestricted unless the other holes, recesses, or openings within the original hole, recess, or opening are encountered, in which case, clause 3.2.3.1 or 3.2.3.2, as applicable, shall be followed.

Note Where the part being tested is a sharp point that lies adjacent to a plane surface, such that the gap between the point and the surface is 0.5 mm or less, that point shall be considered as being not accessible and shall not be tested.

3.2.4 Criteria for conformity

A part or component of a toy is deemed to be accessible if it can be contacted by any portion of the accessibility probe.

3.3 Sharp edges

3.3.1 Apparatus

As in Figure 2, consisting of :

- (1) A mandrel made of steel having a test surface that is free from any defects such as scratches, or burrs and a roughness (Ra) of not greater than 0.40 μm and a hardness of not less than 40 HRC when measured on the Rock well C scale.
- (2) A pressure-sensitive polytetrafluoroethylene (PTFE) high temperature electrical insulation tape, having a thickness of the polytetrafluoroethylene between 0.066 mm and 0.090 mm. The adhesive thickness shall be 0.08 mm and the width of the tape shall not be less than 6 mm.
- (3) A device, capable of rotating the mandrel at a constant tangential velocity of 25 ± 2 mm/s.

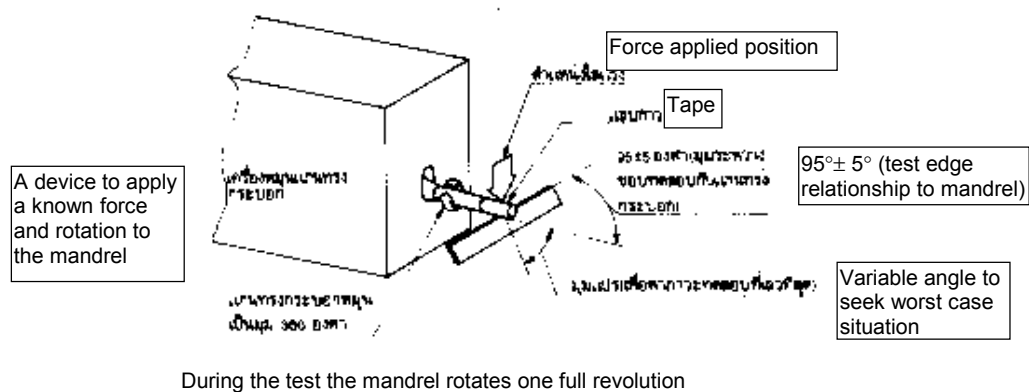


Figure 2 Edge test apparatus
(clause 3.3.1)

3.3.2 Procedure

- 3.3.2.1 Support the toy such that the accessible edge to be tested does not bend or move when the force of the mandrel is applied. Ensure the support is not less than 15 mm from the edge to be tested. Part of the toy may need to be removed or disassembled to allow the sharp edge testing device to test the accessible edge. Removal or disassemble of the toy may affect the rigidity if the edge under test; in this case, the sharp-edge test shall be performed with the edge supported so that its stiffness approximates the edge stiffness in the assembled toy.
- 3.3.2.2 Wrap the mandrel with one layer of the tape to provide sufficient area for performing the test.
- 3.3.2.3 Place the taped mandrel such that its axis is at $90 \pm 5^\circ$ to the line of a straight edge, or $90 \pm 5^\circ$ to a tangent at the test point of a curved edge, and the tape is in contact with the edge when the mandrel is rotated.
- 3.3.2.4 Apply the maximum force that will not cause the edge to bend but not exceeding 6 N to the mandrel and rotate the mandrel 360° about its axis against the edge.
- 3.3.2.5 Remove the tape from the mandrel without enlarging any cut in the tape to become a cut. Measure the length of the tape that is cut, which shall include any intermittent cuts. Measure the length of tape which has contacted the edge during the test.

3.3.3 Calculation

Calculate the percentage length of the tape which has been cut during the test of the length of tape which has contacted the edge during the test from the formula:

$$\text{Length of the tape which has been cut, \%} = \frac{L_1}{L_2} \times 100$$

Where L_1 is the length of the tape which has been cut ; mm
 L_2 is the total length of the tape which has contacted the edge ; mm

3.3.4 Criteria for conformity

If 50% or more of the line of contact of the tape with the edge is completely cut, the edge is to be considered a sharp edge.

3.4 Sharp points

3.4.1 Apparatus

A sharp point tester as shown in Figure 3, or any device utilizing the same reference dimensions and yielding equivalent results, is required.

- (1) The gauging cap shall have a gauging slot which is a rectangular opening dimensions measuring 1.02 ± 0.02 mm wide by 1.15 ± 0.02 mm long.
- (2) The sensing head with its end in the gauging slot shall be 0.38 mm from the external face of the gauging cap.
- (3) Electrical contact spring shall be such that it will enable the light up of the indicator lamp if the test point is inserted into the gauging slot with a force of 2 N.

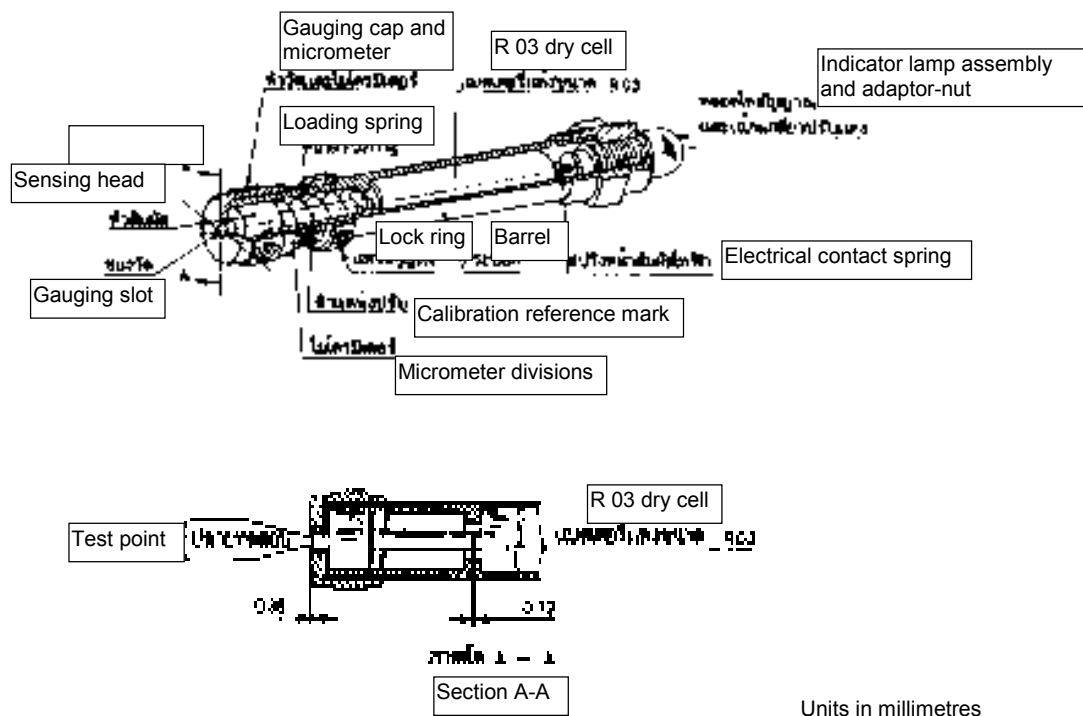


Figure 3 Sharp point tester
(clause 3.4.1)

3.4.2 Procedure

3.4.2.1 Support the toy to be tested in such a manner that the point does not move during the test. Support may be given at the toy or at the test point, but not at a distance less than 6 mm from the point to be tested. Part of the toy may need to be removed or disassembled to allow the sharp edge testing device to test the accessible edge.

Removal or disassembly of the toy may affect the rigidity of the edge under test ; in this case, the sharp-edge test shall be performed with the edge supported so that its stiffness approximates the edge stiffness in the assembled toy.

3.4.2.2 Adjust the point tester by :

- (1) Loosening the lock ring and rotating it so that it moves toward the indicator lamp assembly a sufficient distance to express the calibration reference mark on the barrel.
- (2) Rotate the gauging cap clockwise until the indicator lamp lights. Rotate the cap counter-clockwise until the sensing head moves a distance of 0.12 mm from marking contact with the dry cell (see section A-A)

(3) Lock the gauging cap in this position by rotating the locking ring until it fits firmly against the cap.

3.4.2.3 Inset the point in the direction which confers the greatest rigidity on the point, into the cap slot and apply a force of 4.5 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.

Observe whether or not the indicator lamp lights up.

3.4.3 Criteria for conformity

If the point being tested penetrates a distance of 0.50 mm or more into the gauging slot, causing the indicator lamp to light, the test point is deemed to be a sharp point.

3.5 Flexure resistance of wires

3.5.1 Test specimens

The specimen shall be a whole wire point.

3.5.2 Procedure

3.5.2.1 Grip both ends of the wire by two appropriate devices. Bend the wire from the upright to one side through 60° and the bend in the opposite through 120° and finally return to the initial position (one cycle).

3.5.2.2 Repeat the test 29 times by the procedure described in clause 3.5.2.1 at a rate of one cycle per second, with a rest of 20 s after each 10 cycles.

3.5.3 Report

Report whether the wire breaks.

3.6 Drop strength

3.6.1 Apparatus

A steel plate having a thickness of 4 mm, which has a 2 mm thick coating of shore A hardness 75 ± 5 (IRHD) International rubber hardness degree).

3.6.2 Procedure

Hold the sample in its normal position of use and drop it through a height of 85 ± 5 cm on to the coated side of the steel plate which is placed on a non-flexible horizontal surface then examine the sample.

3.6.3 Report

3.6.3.1 In the case of driving mechanism, examine whether the sample still functions normally and the mechanism has not become detached.

3.6.3.2 In the case of rattles, report whether the sample cracks or breaks.

3.7 Reaction of protective components to traction

Subject the part to be tested to a tensile force determined by the mass of the toy or 60 N, whichever is greater, for 10 s. Report whether the part becomes detached from the toy.

3.8 Dimensions

3.8.1 Apparatus

A tester having dimensions as indicated in Figure 4.

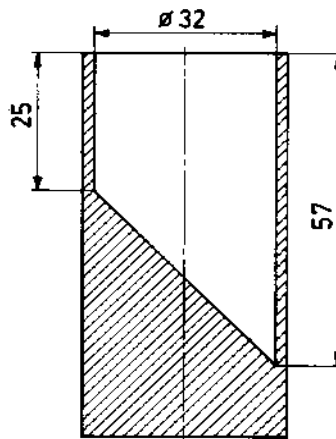


Figure 4 Dimension tester
(clause 3.8.1)

- 3.8.2 Test specimens
- 3.8.2.1 Small toys intended for children under 3 years
The test specimen shall be the whole toy.
- 3.8.2.2 Small toys and detachable components intended for children under 3 years
The test specimens shall be the detachable components.
- 3.8.3 Procedure
Place the test specimen, in the most unfavorable position, without compressing in a cylinder.
- 3.8.4 Criteria for conformity
If the test specimen fits completely into the cylinder, it shall be considered a small toy or detachable component.
- 3.9 Static strength
Load the test specimen, on its standing or sitting surface, with a mass of 50 kg for 5 min.
Remove the load and report whether any part of the test specimen is broken.
- 3.10 Dynamic strength
- 3.10.1 Load the test specimen with a mass of 50 kg so that the forces act at the positions corresponding to normal use of the toy and the center of gravity is 150 mm above the surface on which the child sits or 400 mm above the surface on which the child stands.
- 3.10.2 Drive straight the sample parallel to the horizontal plane three times against a 150 mm high non-resilient step at a speed of 2 m/s.
- 3.11 Stability on an inclined plane
- 3.11.1 Apparatus
A smooth surface plane inclined at 10°
- 3.11.2 Procedure
load the sample, on its standing or sitting surface, with a mass of 50 kg and stand it on a plane inclined.
- 3.11.3 Report
Report whether the sample tips over.
- 3.12 Braking
- 3.12.1 Apparatus
A smooth surface plane inclined at 10°
- 3.12.2 Procedure
- 3.12.2.1 Load the sample, on its standing or sitting surface, with a mass of 50 kg and stand it on a plane inclined at 10° with its longitudinal axis parallel to the inclined surface.
- 3.12.2.2 Apply a force of 50 N to the control of the braking device by the following means and report whether the sample moves.
- (1) If the brake is operated by a handle, apply the force of 50 N at right angles to the axis of the handle, at the middle of the handle.
- (2) If the brake is operated by a pedal, apply the force of 50 N in the operating direction producing the brake.
- (3) If the vehicle has several brakes, test each brake separately.
- 3.13 Strength of swings
- 3.13.1 Static strength of swings
Load the toy for 1 h, on its standing or sitting surface, uniformly by a mass of 200 kg which is to be representative of a child. (In the case of swing intended for use on frames with suspension points less than 120 cm above base level and which have a safety

device to prevent the child falling from the seat, the mass of 66 kg, being representative of a child, shall be used. Remove the load and report whether any part of the sample is broken, damaged or impaired its performance in use.

3.13.2 Dynamic strength of swings

Load the toy, on its standing or sitting surface, with a mass of 50 kg being representative of a child. Lift through an angle of 60° to the vertical with the suspension means shall not loosen. Swing it freely until it standstill as initial. Remove the load and report whether any part of the toy is broken, damaged or impaired its performance in use.

3.14 Stability of heavy toys

3.14.1 Apparatus

A smooth surface plane inclined at 5°

3.14.2 Procedure

Stand the sample in the most unfavorable position on a plane inclined. Adjust any moving parts so as to produce the most unfavorable position for stability.

3.14.3 Report

Report whether the sample tips over

3.15 Resistance to torque

Apply a torque clockwise and gradually to the protective cover or magnetic material within a period of 5 s, until either a rotation of 180° from the original position has been attained or the torque specified in Table 2 has been reached. Maintain the specified torque for a further 10 s. Examine whether the protective cover or magnetic material becomes detached. Test the toy for hazardous sharp edges and hazardous sharp point in accordance with clause 3.3 and clause 3.4 respectively.

Table 2
Torque for protective cover and magnetic material
(clause 3.15)

Age grading	Torque N m
Up to 18 months	0.2
More than 18 months and Up to 3 years	0.375
More than 3 years	0.50

3.16 Tensile strength

Apply a tension force as specified in Table 3 to the protective cover or magnetic material within a period of 5 s and in a direction parallel to the major axis. Examine whether the protective cover or magnetic material becomes detached. Test the toy for hazardous sharp edges or hazardous sharp points in accordance with clauses 3.3 and 3.4 respectively.

Table 3
Tensile force
(clause 3.16)

Age grading	Tensile force N
Up to 18 months	50
More than 18 months and Up to 3 years	75
More than 3 years	90

3.17 Impact

3.17.1 Apparatus

A vertical concrete wall or similar impact surface having a smooth surface.

3.17.2 Procedure

3.17.2.1 Load the projectile into the discharge mechanism of the toy sample.

3.17.2.2 Position the toy such that the major axle of the projectile is at right angles to the plane of the impact surface and the end of the toy (i.e. the end of the projectile or the end of the discharge mechanism, whichever protrudes the furthest) is 300 mm from the plane of impact surface.

- 3.17.2.3 Release the discharge mechanism such that the projectile is propelled at and strikes the impact surface. Allow the projectile to come to rest.
- 3.17.2.4 Repeat steps in clauses 3.17.2.1 to 3.17.2.3 a further two times. Test the projectile for hazardous sharp edges and hazardous sharp points in accordance with clauses 3.3 and 3.4 respectively.

3.18 Imitation protective equipment

3.18.1 Apparatus

3.18.1.1 An imitation protective equipment tester as shown in Figure 5

3.18.1.2 A mass of 1 kg

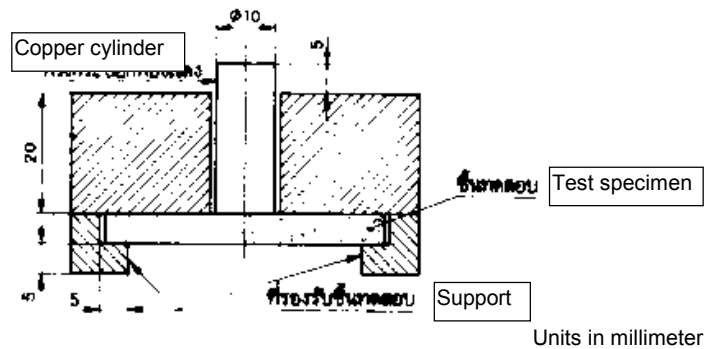


Figure 5 imitation protective equipment tester
(clause 3.18.1.1)

3.18.2 Test specimen

The test specimen shall be the transparent material which is separated from the toy.

3.18.3 Procedure

Place the material in the apparatus, so that it is supported all along its periphery. Drop a mass of 1 kg through a distance of 100 mm onto the top of the cylinder.

3.18.4 Report

Report whether the test specimen is broken.

3.19 Expansion of material in the water

3.19.1 Test specimen

The test specimen shall be a seed or other material that produces noise and shall be removed from the toy

3.19.2 Procedure

Measure the dimensions of the material. Place the material into the water at a temperature of $27 \pm 2^\circ\text{C}$ for 24 h, and remeasure the dimensions.

3.19.3 Report

The percentage of an average increasing dimension of the test specimen shall be reported.

3.20 Impact strength

3.20.1 Apparatus

3.20.1.1 A smooth surface steel plate

3.20.1.2 A metal plate having a cross sectional area of 50 cm^2 and a total mass of 1 kg.

3.20.2 Procedure

Place the sample on the steel plate. Release the steel plate from a height of 100 mm (measure from the lower plane surface of the metal plate to the topmost surface of the test specimen) so that it drops onto the sample.

3.20.3 Report

Report whether the sample cracks or breaks.

- 3.21 An electric resistivity of strings of kites or of other flying toys
- 3.21.1 Apparatus
A high-voltage resistance meter
- 3.21.2 Test specimen
The test specimen shall be a whole hand-held line of kite or of other flying toy.
- 3.21.3 Procedure
Measure on electric resistivity of the test specimen at a temperature of $27 \pm 2^{\circ}\text{C}$ and at a relative humidity of $65 \pm 5\%$ at least 3 positions throughout the line.
- 3.21.4 Report
The average value shall be reported.
- 3.22 Type of glass
Immerse the clean sample in a mixture of 16 parts of methanol and 84 parts of benzene by volume contained in a wide mouth bottle with spiral stopper. Examine the sample in the solution. If visible, the sample is borosilicate glass.
- 3.23 Fuel containing
- 3.23.1 Solid fuel
Fill the container with fuel in accordance with the manufacturer's instructions. Tip the fuel container, as appropriate, through 90 degree to the horizontal in any direction. Report whether the solid fuel escapes from the container.
- 3.23.2 Liquid fuel
Separate the fuel container from the sample. Fill the container with the fuel in accordance with the manufacturer's instructions. Tip the fuel container, through 90 degree to the horizontal in any direction. Report whether the liquid fuel escapes from the container.
- 3.24 Flammability
- 3.24.1 Apparatus
- 3.24.1.1 A cabinet tester, having a controlled atmosphere with a speed of not exceeding 0.2 m/s during the whole period of testing.
- 3.24.1.2 A gas burner capable of adjusting a flame height.
- 3.24.2 Preparation of test sample
The test sample shall be prepared in accordance with the manufacturer's instructions specified on the label as follows :
- (1) Toys not intended to be washed
The sample shall not be washed or soaked before testing.
- (2) Toys with recommended method of washing or cleaning
The sample shall be tested before and after treating in accordance with these recommendations.
- (3) Toys without information relating to washing or cleaning
The sample shall be tested before and after treating in accordance with clause 3.24.3
- 3.24.3 Washing of sample
- 3.24.3.1 Immerse the sample in tap water at a volume of at least 20 times the volume of the sample for 10 min and allow it to drain.
- 3.24.3.2 Repeat twice as in clause 3.24.3.1. Rinse by immersing the sample in demineralized water for 2 min. Drain and dry by a method appropriate to the sample. Condition the sample in an atmosphere having a temperature of $27 \pm 2^{\circ}\text{C}$ and a relative humidity of $65 \pm 5\%$ for at least 7 h prior to testing.
- 3.24.4 Procedure
- 3.24.4.1 Masks
- (1) Position the sample vertically. Move the gas burner to an angle of 45° , adjust the flame height to 20 mm and apply the test flame to the sample for 5 s so that the flame makes contact at least 20 mm above the lower edge

of the sample and the distance between the end of the burner and the surface of the sample is about 5 mm.

- (2) Remove the flame and report whether ignition has occurred and if so measure the duration of flaming and the distance between the upper edge of the burnt area and the point of application of the flame.

3.24.4.2 Beards, moustaches, wigs, masks and other attached material with of piles or hair element longer than 50 mm.

- (1) Measure the length of the pile or hair element accurately to 0.1 mm.
- (2) Position the sample so that the largest dimension of the pile hair element hangs vertically or as nearly vertically as possible.
- (3) With the burner in the vertical position, apply a 20 mm high test flame for 2 s to the lower edge of the pile hair element of the toy so that the flame penetrates the element by approximately 10 mm.
- (4) Remove the flame, examine whether ignition has occurred and if so measure the duration of flaming and the length of the pile or hair element remaining.

3.24.4.3 Soft toys with pile fabrics

- (1) The test shall be carried out in accordance with clause 3.24.4.1. Apply a test flame to the toy for 2 s so that the distance between the edge of the burner tube and the sample is approximately 5 mm and the flame makes contact at least 20 mm above the lower edge of the sample.
- (2) Remove the flame, measure the time taken for the flame to spread on the surface of the sample over the distance between the point of application of the flame and the upper edge of the sample. The rate of the flame spread shall be expressed in mm/s.

3.25 Coating materials

3.25.1 Preparation of test sample

3.25.1.1 Toys with the same coating material on all parts

Remove a sufficient quantity of the coating material from each test portion by a suitable means, mix and make up to a mass less than 500 mg. Crush until it passes through the 500 μm sieve and weight the obtained material (W_1).

3.25.1.2 Toys with different coating material on parts

Coating material removed from each parts shall be separately analyzed. Sample preparation shall be in accordance with clause 3.25.1.1.

3.25.2 Preparation of test portion

3.25.2.1 Reagents

- (1) Mix the sample prepared as in clause 3.25.1 with the hydrochloric acid solution specified in clause 3.25.2.1(1) that is equivalent to 50 times the mass of the sample. Shake for 1 minute.
- (2) Check the acidity of the mixture. If the pH is more than 1.5, add drop by drop, with shaking, the hydrochloric acid solution (clause 3.25.2.1(2)) until the pH is 1.5 or less.
- (3) Shake the mixture obtained in clause 3.25.2.2(2) continuously for 1 h. Allow the mixture to stand at a temperature of $27 \pm 2^\circ\text{C}$ for 1 h. Filter the mixture through filter paper to obtain the test portion.

3.25.3 Preparation of blank solution

Carry out the same procedure as described for preparing the test portion but omitting the sample.

3.25.4 Analytical procedure

Analyze the concentration each heavy metal in the test portion by the procedure specified in ISO 3856.

3.25.5 Report

Report the concentration, in milligrams of each of the elements present per kilogram of the sample.

3.26 Graphic material

3.26.1 Preparation of test sample

3.26.1.1 Graphic material that is a solid, e.g. core of a pencil
Preparation of the test sample shall comply with clause 3.25.1.1

3.26.1.2 Graphic material that is a liquid
Accurately weigh out the sample (W_1) and separate the solid particles from the sample by means of centrifuge.

3.26.1.3 Graphic material containing grease, oil or similar material
Accurately weigh out (W_1) and separate the grease, oil or similar material from the sample by a suitable solvent without adversely affecting the solid particles. Then the obtained filtrate shall be used for preparation of test portion.

3.26.2 Preparation of test portion

The preparation of test portion shall comply with clause 3.25.2.

3.26.3 Preparation of blank solution

Carry out the same procedure described for preparing the test portion but omitting the sample.

3.26.4 Analytical procedure

Analyze the concentration of each of the elements by the procedure specified in ISO 3856.

3.26.5 Report

Report the concentration, in milligrams of each of the elements present per kilogram of the sample.

3.27 Plastics

3.27.1 The concentration of elements

3.27.1.1 Preparation of test sample
The preparation of the test sample shall comply with clause 3.25.1.1

3.27.1.2 Preparation of test portion
The preparation of test portion shall comply with clause 3.25.2

3.27.1.3 Preparation of blank solution
Carry out the same procedure described for preparing the test portion but omitting the sample.

3.27.1.4 Analytical procedure
Analyze the concentration of each of the elements by the procedure specified in ISO 3886.

3.27.1.5 Report
Report the concentration, in milligrams of each of the elements present per kilogram of the sample.

3.27.2 The concentration of hexane-soluble substances

3.27.2.1 Preparation of the test sample
The preparation of the test sample shall comply with clause 3.25.1.1.

3.27.2.2 Analytical procedure

(1) Collect the sample obtained from clause 3.27.2.1 in a flask with fitted stopper and wash the sample by boiling for at least 5 minutes in distilled water. Then filter off the distilled water.

(2) Add sufficient analytical reagent grade hexane to the flask with the sample such that the sample is completely immersed. Where the density of the sample is less than the hexane (or the particles of the sample are liable to float on the surface of the hexane), use any suitable means to ensure that the particles are totally immersed in the hexane. Stopper the flask and maintain it at a temperature of $27 \pm 2^\circ\text{C}$ for 24 hours.

- (3) After this period, filter off the residue collecting the filtrate in an accurately weighed and clean extraction flask.
- (4) Wash the residue and the flask three times and collect the washing in the flask with the filtrate. Each washing shall be with 10 ml of hexane.
- (5) Evaporate the hexane from the filtrate by distillation and then place into the oven at $75 \pm 2^\circ\text{C}$ for 30 minutes and heat the flask to constant mass (W_3).

3.27.2.3 Calculation

The concentration of hexane-soluble substances, % = $\frac{W_3 - W_2}{W_1} \times 100$

Where W_1 is the mass, in grams, of extraction flask and hexane-soluble substances
 W_2 is the mass, in grams, of extraction flask
 W_3 is the mass, in grams, of the sample

3.27.2.4 Report

The percentage of hexane-soluble substances shall be reported.

3.28 Paper and paper board

3.28.1 Preparation of test sample

Cut up the sample into pieces having a dimension $6 \text{ mm} \times 6 \text{ mm} \times$ thickness of each of the test portion, combine and make up mass of not less than 1.5 g and accurately weigh the sample (W_1)

3.28.2 Preparation of test portion

3.28.2.1 Mix the sample so prepared as in clause 3.28.1 with 25 times its mass of distilled water and then comminute the whole by using a high speed stirrer or other device until the particles in the test specimen become pulp.

Where the test specimen is of the form that will not become pulp easily, use hot distilled water and allow to cool to a temperature of 50°C prior to analysis.

3.28.2.2 Add the hydrochloric acid solution 0.5% by weight, that is equivalent to 25 times the mass of the sample. Shake the mixture for 1 minute. Check the acidity of the mixture.

If the pH is more than 1.5, add drop by drop, with shaking, the hydrochloric acid solution 7.3% by weight, until the pH is 1.5 or less.

3.28.2.3 Shake continuously the mixture obtained from clause 3.28.2.2 for 1 h. Allow the mixture to stand at a temperature of $27 \pm 2^\circ\text{C}$ for 1 h. Filter the mixture through filter paper to obtain the test portion.

3.28.3 Preparation of blank solution

Carry out the same procedure described for preparing the test portion but omitting the sample.

3.28.4 Analytical procedure

Analyze the concentration of each of the elements by the procedure specified in ISO 3856.

3.28.5 Report

Report the concentration, in milligrams of each of the elements present per kilogram of the sample.

3.29 Colourant and modelling clay

3.29.1 Preparation of test sample

The preparation of the test sample shall comply with clause 3.26.1.3

3.29.2 Preparation of test portion

Carry out the same procedure described in clause 3.25.2 using hydrochloric acid solution (clause 3.25.2.1(1)) that is equivalent to 15 times the mass of the solid particles.

3.29.3 Preparation of blank solution

Carry out the same procedure described for preparing the test portion but omitting the sample.

3.29.4 Analytical procedure

Analyze the concentration of each of elements by the procedure specified in ISO 3856.

3.29.5 Report

Report the concentration, in milligrams of each of the elements present per kilogram of the sample.

Ministerial Notification

No. 2280 B.E. 2540(1997)

Persuant to the Industrial Product Standards Act

B.E. 2511(1968)

on Amendment to the Thai Industrial Standard for Toys Part 1 (Amendment No. 1)

Whereas it is expedient to revise the Thai Industrial Standard (TIS) 685 Part 1- 2530(1987),
By virtue of Section 15 of the Industrial Product Standards Act B.E. 2511(1968), the Minister of Industry issues the Notification concerning amendment to the Thai Industrial Standard for Toys Part 1 attached to the Ministerial Notification No.1196 (B.E. 2530) dated 4 July B.E. 2530 as follows :

1. The number of this standard should be amended from "TIS 685 Part 1-2530" to "TIS 685 Part 1-2540".
2. Clause 1.2 should be withdrawn and replaced by the following :
"1.2 This standard covers all toys including their parts and accessories, except the following:
 - 1.2.1 Decoration strips and materials such as coloured paper, silver strips and gold strips
 - 1.2.2 Bicycles having maximum saddle height of 635 mm
 - 1.2.3 Darts, slingshots and catapults
 - 1.2.4 Public playground equipment
 - 1.2.5 Air guns and air pistols
 - 1.2.6 Handicraft products which are not primarily of play value, but for decorations or collection
 - 1.2.7 Model kits in which the finished item is not primarily of play value
 - 1.2.8 Sporting equipment, camping equipment, athletic equipment, musical instruments, furniture excluding toys that are their counterparts or faithful reproduction of those mentioned equipment which is manufactured for play and suitable for children
 - 1.2.9 Powered models of aircraft, rockets, boats and land vehicles excluding toys that are their counterparts or faithful reproduction of those equipment which is manufactured for play and suitable for children
 - 1.2.10 Adult collectible products
 - 1.2.11 Aquatic equipment intended to be used in deep water and is large enough to support a child, e.g. boats and rafts
 - 1.2.12 Professional toys installed in public places such as arcades and malls
 - 1.2.13 Puzzles having more than 500 pieces or without a picture
 - 1.2.14 Fireworks
 - 1.2.15 Products containing heating elements intended for use under the supervision of an adult in a teaching context
 - 1.2.16 Vehicles with combustion engines
 - 1.2.17 Toy steam engines
 - 1.2.18 Video toys that can be connected to a video screen and operated at a nominal voltage greater than 24 Volt
 - 1.2.19 Babies' dummies
 - 1.2.20 Electric ovens, irons or other functional products operated at a nominal voltage greater than 24 Volt

- 1.2.21 Fashion jewellery for children
 - 1.2.22 Flotation aids providing buoyancy in water
 - 1.2.23 Swimming goggles, sunglasses and other eye protectors including bicycle and skateboard helmets
 - 1.2.24 Items that are propelled into free flight by releasing an elastic band in the same way as catapults such as aeroplanes and rockets
 - 1.2.25 Chemistry sets
3. The following should be added as Clause 2.8
 "2.8 FINGER PAINT : Concentrated liquid paint to be used by children in art work by dipping fingers into it and painting on required materials."
 4. Clause 4.1.7.2, "less than 2 mm" should be amended to "less than 5 mm".
 5. The following should be added as Clause 4.1.9
 "4.1.9 Seams of toys made of textile materials
 After being tested in accordance with TIS 685 Part 3, seams and threads in the seam area shall not be torn, or the cover material adjacent to the seams shall not be separate."
 6. Clause 4.2.2 should be withdrawn and replaced by the following
 "4.2.2 Toys with non-detachable components intended for children under 3 years
 Small and non-detachable components shall be so fixed to the toy that they cannot become loosened or detached when they are submitted to the tension in accordance with TIS 685 Part 3 as follows
 (1) 50 N ± 2 N when the dimension is less than or equal to 6 mm.
 (2) 90 N ± 2 N when the dimension is greater than 6 mm.
 7. Clause 4.2.4.2, "760 mm" should be amended to "750 mm".
 8. Clause 4.2.9.1(5), "shall be greater than 12 mm" should be "shall be less than 5 mm or greater than 12 mm".
 9. Clause 4.2.11 should be withdrawn and replaced by the following
 "4.2.11 Projectile toys or projectile firing toys
 4.2.11.1 General requirements
 (1) Projectile toys shall have a tip radius of not less than 2 mm.
 (2) Protective components or magnetic materials of resilient materials used as impact surfaces, when tested for tension and torque in accordance with TIS 685 Part 3, shall not become detached and shall not produce hazardous sharp edges or points.
 (3) Projectile firing toys shall be able to discharge missiles provided only with the toys and shall pass the impact test in accordance with TIS 685 Part 3.
 4.2.11.2 Projectile toys without stored kinetic energy
 (1) Points of darts or arrows shall not be made of metals, except when they are dependent on magnetic forces, they can be made of magnetic materials.
 (2) Projectile toys in the form of aircraft and missiles, e.g. guns shall not be made of metals and shall have blunt points. Their impact surfaces shall be protected by a resilient material (e.g. rubber) and shall have a cross sectional area of not less than 3 cm².
 4.2.11.3 Projectile toys with stored kinetic energy
 (1) Faithful reproduction of firing weapons shall have bright orange strips with the width of not less than 6 mm.
 (2) Missiles shall not be made of metal and shall have blunt points.
 (3) The average kinetic energy of projectile firing toys, when tested for kinetic energy of projectiles shall not exceed 0.08 Joule for rigid

missiles without resilient impact surfaces, and 0.5 Joule for resilient missiles or missiles with resilient impact surfaces.

(4) For missiles whose average kinetic energy exceeds 0.08 Joule, their impact surfaces shall be protected by a resilient material (e.g. rubber). The average kinetic energy per unit area of the resilient impact surface, when tested for kinetic energy of projectiles in accordance with TIS 685 Part 3, shall not exceed 0.16 Joule/cm².

4.2.11.4 There shall be a warning instruction and an instruction for use on the label.

10. Clause 4.2.12 should be withdrawn.
11. Clause 4.2.13, "non-projectile" should be added in front of "weapons".
12. The following should be added as (4) of Clause 4.2.15
 "(4) When tested for shape and size in accordance with TIS 685 Part 3, no portion shall be capable of entering and penetrating to the full depth of the cavity of the test templates A and B.
13. Clause 4.2.21.4, "21°C" should be "25°C", "26°C" should be "30°C" and "31°C" should be "35°C"
14. Clause 4.2.21.5, "41°C" should be "45°C" and "51°C" should be "55°C".
15. Clause 4.2.22 should be withdrawn and replaced by
 "4.2.22 Squeeze toys, teething toys and teething toys for children under 3 years
 - 4.2.22.1 When tested for shape and size in accordance with TIS 685 Part 3, no portion shall be capable of entering and penetrating to the full depth of the cavity of the test templates A and B.
 - 4.2.22.2 When tested for leakage in accordance with TIS 685 Part 3, there shall be no leakage of the contents nor any splitting nor cracking nor other damages.
16. Clause 4.3.1 "Masks" should be amended to "Masks and part of masks with hair protruding less than 50 mm, or with no hair".
17. Clause 4.3.2 "Masks and other product with the hair protruding more than 50 mm" should be amended to "and masks with fluffy hair or hair protruding more than 50 mm".
18. Clause 4.4 should be withdrawn and replaced by the following
 "4.4 Chemical properties
 - 4.4.1 Paints
 The concentrations of heavy metals in solution extracted from paints shall not exceed those specified in Table 3.
 Analysis of paint should be in accordance with TIS 685 Part 3.
 - 4.4.2 Coatings
 The concentrations of heavy metals in solution extracted from coatings shall not exceed those specified in Table 3.
 Analysis of coatings should be in accordance with TIS 685 Part 3.
 - 4.4.3 Writing materials
 The concentrations of heavy metals in solution extracted from writing materials shall not exceed those specified in Table 3.
 Analysis of writing materials should be in accordance with TIS 685 Part 3.

Table 3 Acceptable heavy metal migration from paints, coatings, writing materials, plastics, paper and paper board (Clauses 4.4.1, 4.4.2, 4.4.3, 4.4.4 and 4.4.5)

Heavy Metals	Maximum Concentration mg per kg
Antimony	60
Arsenic	25
Barium	1000
Cadmium	75
Chromium	60

Lead	90
Mercury	60
Selenium	500

4.4.4 Plastics

The concentrations of heavy metal in solution extracted from plastics shall not exceed those specified in Table 3.

Analysis of plastics shall be in accordance with TIS 685 Part 3.

4.4.5 Paper and paper boards

The concentrations of heavy metal in solution extracted from paper and paper boards shall not exceed those specified in Table 3.

Analysis of paper and paper boards shall be in accordance with TIS 685 Part 3.

4.4.6 Finger paints and modelling clay

The concentrations of heavy metal in solution extracted from finger paints and modelling clay shall not exceed those specified in Table 3.

Analysis of finger paints and modelling clay shall be in accordance with TIS 685 Part 3.

Table 4 Acceptable heavy metal migration from finger paints and modeling clay
(Clause 4.4.6)

Heavy Metals	Maximum Concentration mg per kg
Antimony	60
Arsenic	25
Barium	250
Cadmium	50
Chromium	25
Lead	90
Mercury	25
Selenium	500

Given on 20 August B.E. 2540

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Minister of Industry

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Ministerial Notification

TIS 685-2540 (1997) : Part 2

No. 2281 B.E. 2540 (1997)**Persuant to the Industrial Product Standards Act****B.E. 2511(1968)****on Amendment to the Thai Industrial Standard for Toys Part 2 (Amendment No. 1)**

Whereas it is expedient to revise the Thai Industrial Standard (TIS) 685 Part 2 - 2530(1987),

By virtue of Section 15 of the Industrial Product Standards Act B.E. 2511(1968), the Minister of Industry issues the Notification concerning amendment to the Thai Industrial Standard for Toys Part 2 attached to the Ministerial Notification No.1197 (B.E. 2530) dated 4 July B.E. 2530 as follows:

1. The number of this standard should be amended from "TIS 685 Part 2 2530" to "TIS 685 Part 2 - 2540".
2. Clauses 1.1 and 1.2 should be withdrawn and replaced by the following
"1.1 This standard specifies packaging, labelling and testing of toys covered in the scope of TIS 685 Toys - Part 1 General requirements.
3. Clause 3.1.1 should be withdrawn and replaced by the following
"3.1.1 Packages made of flexible plastics
 - (1) Flexible plastics packaging for toys or bags or the part of other packaging materials, e.g. paper boxes shall have thickness of not less than 0.038 mm.
Testing should be in accordance with ISO 4591.
 - (2) Plastic bags for toys shall have an opening perimeter greater than 380 mm and shall not have a draw-string or strap or cord as a means of closing.
Measurement shall be performed by means of observation.
4. Clause 4.3 should be withdrawn.
5. Clause 4.4, " 2.0 mm " should be amended to " 3.0 mm ".
6. Clause 4.5, " in a colour contrasting with " should be amended to " in a colour which is durable and in contrast with ".
7. Clause 4.7.1.3 should be withdrawn and replaced by the following
"4.7.1.3 Stationary toys and swings shall be accompanied by instructions drawing attention to the need to carry out regular check and maintenance of the main parts and components."
8. Clause 4.7.1.4 should be withdrawn and replaced by the following
"4.7.1.4 Projectile toys or projectile firing toys shall be accompanied by warning instructions for the hazards which may be caused in projectiles and the hazard of using inappropriate missiles or darts."
Where the kinetic energy of projectile toys exceeds 0.08 Joule, the toys shall be labelled with a statement " Do not fire at the hazardous distance ".
9. Clause 4.7.1.5 should be withdrawn and replaced by the following
"4.7.1.5 Toys which are faithful reproduction of protective equipment, e.g. safety helmets and eye protectors shall be labelled with a statement " Does not provide such protection as the real equipment " or " Does not prevent ultra violet beam ".
10. Clause 4.7.1.7, " to be used in shallow water under the supervision of adults " should be amended to " to be used in shallow water in which the child is within its depth and under the supervision of an adult ".
11. Clause 4.7.1.8 should be withdrawn and replaced by the following

- "4.7.1.11 Toys which are propelled by children, e.g. toy roller skates and toy skateboards should carry a label " Protective equipment should be worn "."
12. The following should be added as Clause 4.7.1.12, Clause 4.7.1.13 and Clause 4.7.1.14
- "4.7.1.12 Liquid filled teethingers shall be accompanied by the following instruction
" Cool only in a domestic refrigerator, do not place in the freezer compartment"."
- 4.7.1.13 Toys which are strung across a cradle, cot or perambulator by means of strings, cords, elastics or straps shall bear the following warning:
" Warning! To prevent possible injury by entanglement, remove this toy when the child begins to push up on hands and knees ".
- "4.7.1.14 Percussion caps specifically designed for use in toys shall carry the following warning:
" Do not fire near eyes or ears. Do not carry caps loose in a pocket or near the heat ".
13. Clause 4.7.2, "350 mm" should be amended to "380 mm".
14. Clause 4.8 should be withdrawn and replaced by the following
- "4.8 Instructions for use
The following toys shall bear instructions for use
4.8.1 Toys which incorporate functional sharp points or sharp edges
4.8.2 Projectile toys or projectile firing toys
4.8.3 Glue and /or solvent used for toys.

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Ministerial Notification**No B.E. 2540 (1997)****Persuant to the Industrial Product Standards Act****B.E. 2511 (1968)****on Amendment to the Thai Industrial Standard for Toys Part 3 (Amendment No. 1)**

Whereas it is expedient to revise the Thai Industrial Standard (TIS) 685 Part 3 - 2530 (1987),

By virtue of Section 15 of the Industrial Product Standards Act B.E. 2511 (1968), the Minister of Industry issues the Notification concerning amendment to the Thai Industrial Standard for Toys Part 3 attached to the Ministerial Notification No..... (B.E. 25) dated as follows:

1. The number of this standard should be amended from " TIS 685 Part 3 - 2530 " to " TIS 685 Part 3 - 2540 ".
2. Clauses 3.2.1, Table 1, Columns 4 and 10, " 3.6 " should be amended to " 5.6 " and " + 0.1 " should be amended to " + 0.1 except for f and g which have a tolerance + 1 ".
3. Clauses 3.6.3.1 should be withdrawn and replaced by the following
"3.6.3.1 In the case of driving mechanisms, examine whether the test sample is still operable and whether the driving mechanisms have become detached.
4. Clause 3.10.2, " 150 mm " should be amended to " 50 mm " and " 2 m per second " should be amended to " 2 m per second + 0.2 m per second ".
5. Clause 3.16 and Table 3 should be withdrawn and replaced by the following
"3.16 Tensile strength
 - 3.16.1 Tensile strength for non-detachable components
Apply a tension load perpendicularly and parallel to the maior axis for not less than 5 s and maintain the force for 10 s. Examine the components.
 - 3.16.2 Tensile strength for seams
Attach the clamps to the cover material of test sample in such a manner that t,he outside diameter of the 19 mm washer at a point nearest the seams shall be close to, but no closer than 13 mm from the edge of the seam stiching thread. Apply a force of 70 N \pm 2 N gradually for not less than 5 s. Maintain the force for 10 s. Examine the seams and the material adjacent to the seam of the test sample.
In the case where the test sample is so small that a clamp cannot be attached to, the tensile test according to Clause 3.16.1 should be performed by applying a force of 70 N + 2N.
 - 3.16.3 Tensile strength for **protective materials or magnetic** materials
Apply a force of 70 N + 2 N to the protective materials or magnetic materials for not less than 5 s. Maintain the force for 10 s. Examine whether the protective materials or magnetic materials have become detached, then carry out sharpness of edges and sharpness of point tests according to Clauses 3.3 and 3.4.
6. Clause 3.19 should be withdrawn and replaced by the following
"3.19 Expansion of materials in the water
 - 3.19.1 Test specimens
Remove a seed or other rattling materials from the test specimen.
Condition the test specimen at 21°C \pm 5°C and at relative humidity of 65 + 5 % for 7 hours.
 - 3.19.2 Procedures

Measure the dimensions of the test samples in the X, Y and Z directions. Submerge the test samples in a container of demineralised water at 21 °C + 5°C for 24 hours ± 0.5 hours. Allow excess water to drain and remeasure the item.

3.19.3 Reporting

Calculate the average expansion in the X, Y and Z dimensions as percentage of the original measurement

7. Clause 3.20.1.2, " 50 cm 2 " should be amended to " with the diameter of 80 mm + 2 mm " and " a total mass of 1 kg " should be amended to " the mass of 1 kg + 0.02 kg ".
8. Clause 3.20.2, " 100 mm " should be amended to " 100 ± 2 mm ".
9. Clause 3.24.4.1, "Masks" should be amended to "Masks and some parts of masks with hair protruding less than 50 mm, or without hair".
10. Clause 3.24.1.2 should be withdrawn and replaced by the following "3.24.1.2 A gas burner capable of adjusting a flame height and to be in accordance with ISO 6941 ".
11. Clause 3.24.4.1 (1), " Move the gas burner to an angle of 45 °, adjust the flame height to 20 mm " to "Adjust the flame height to 20 mm + 2 mm, move the gas burner to an angle of 45° .
12. Clause 3.24.4.2, " Masks and other materials with pile of hair element longer than 50 mm " should be amended to " and masks with fluffy pile of hair element longer than 50 mm ".
13. Clause 3.24.4.2(3), " 20 mm " should be amended to " 20 mm ± 2 mm".
14. Clause 3.24.4.3 (1) should be withdrawn and replaced by the following "3.24.4.3 (1) Position the test sample vertically with the head uppermost. In the case where more than one orientation is possible, the most onerous position should be chosen. Carry out the test according to Clause 3.24.4. with the distance between the edge of the burner tube and the sample of approximately S mm so that the flame makes contact at least 20 mm above the lower edge of the sample for 3 s."
15. Clauses 3.25 to 3.29 should be withdrawn and replaced by the following "3.25 Chemical characteristics
Analysis of migration of heavy metals extracted from paints, coatings, writing materials, plastics, paper and paper board, finger paints and modelling clay should be in accordance with ISO 8124 -3.

3.26 Projectiles of projectile toys or projectile firing toys

3.26.1 Kinetic energy

3.26.1.1 Weigh the test specimen (m).

3.26.1.2 Measure the velocity of the test sample by dropping the test sample from equipment at a certain distance. Take S measurements and calculate the average velocity.

3.26.1.3 The kinetic energy of a projectile is determined from the equation:

$$\text{Kinetic energy Joule} = \frac{1}{2}mv^2$$

where m is the mass of the test specimen in kilograms

v is the average velocity of the test sample in meter per second

3.26.2 Kinetic energy density

3.26.2.1 Mark the surface area of the test sample with printing ink.

- 3.26.2.2 Measure the kinetic energy of the test specimen by on the concrete blocks or other appropriate materials which are 300 mm from the firing point or other appropriate materials.
- 3.26.2.3 Measure the impact area on concrete blocks
- 3.26.2.4 The kinetic energy density is determined from the equation:
Kinetic energy density = $\frac{\text{Kinetic energy}}{\text{Impact area}}$
- 3.26.2.5 Repeat these procedures twice and calculate the average kinetic energy as Joule per cm².

3.27 Shape and size of rattles or teething toys

- 3.27.1 Position and clamp the test templates A and B (see figures 6 and 7) so that the axis of the slot is vertical and the slot is unobstructed at its top and bottom openings.
- 3.27.2 Orientate the toy to be tested in a position which would most likely permit the entry of the toy through the slot in the test template. Place the toy in the slot so that the force on the toy is only the force due to its mass. Observe whether the toy passes through the slot or whether any part of the toy protrudes past the base of the templates A and B.

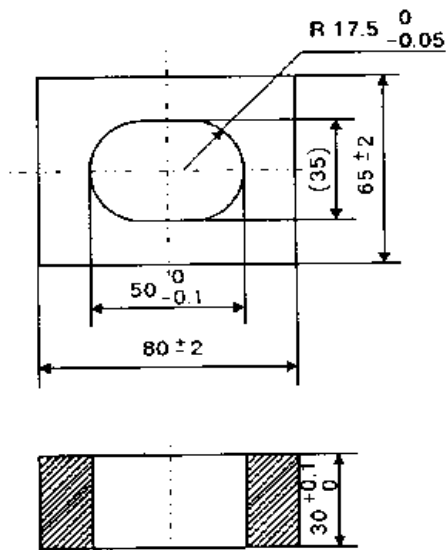


Figure 6 Shape and Size of Template A

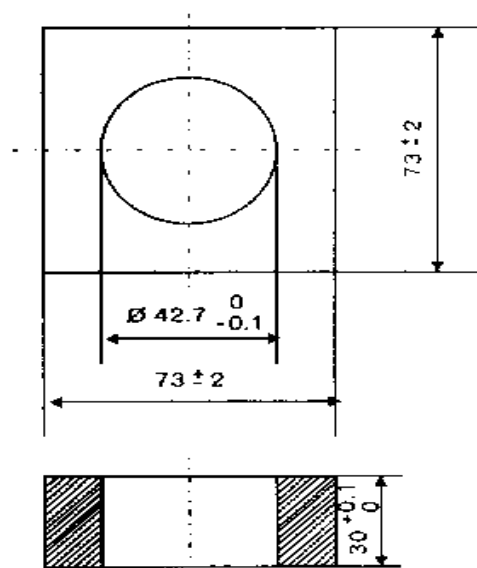


Figure 7 Shape and Size of Template B

3.28 Leakage of liquid filled toys

- 3.28.1 Condition the test specimen at a temperature of 37°C ± 1°C for not less than 4 hours.
- 3.28.2 Within 30 seconds of removing the toy from conditioning, apply a force of SN + 0.5 N to the external surface of the toy through a steel needle with a diameter of 1 mm ± 0.1 mm and with a diameter of 1 mm ± 0.1 mm with a tip radius of 0.5 mm ± 0.05 mm. Apply the force gradually within a period of 5 s. Maintain the force for 5 s.
- 3.28.3 Examine the test specimen for leakage of the contents by applying cobalt chloride paper over the area where the force was applied whilst elsewhere compressing with a

force of of 5 N + 0.5 N using suitable means other than a needle.

3.28.4 Condition the same test specimen which has passed the test at a temperature of $5^{\circ}\text{C} + 1^{\circ}\text{C}$ for not less than 4 hours.

3.28.5 Repeat the test in Clauses 3.28.2 and 3.28.3.

Give on 20 August B.E. 2540

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Minister of Industry

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