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## Safety of toys —

### Part 1: Safety aspects related to mechanical and physical properties

#### AMENDMENT 4: Acoustics

iTeh STANDARD PREVIEW

*Sécurité des jouets —*

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*Partie 1: Aspects de sécurité relatifs aux propriétés mécaniques et  
physiques*

ISO 8124-1:2014/FDAMd 4

AMENDEMENT 4:

<https://standards.iteh.ai/catalog/standards/sist/b4b26f8a-d112-4e34-95ba-82aad224f39c/iso-8124-1-2014-fdamd-4>

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CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
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This document was prepared by Technical Committee ISO/TC 181, *Safety of toys*.

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# Safety of toys —

## Part 1:

# Safety aspects related to mechanical and physical properties

## AMENDMENT 4: Acoustics

### 2 Normative references

Replace the existing reference to ISO 11202 with the following:

ISO 11202, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections*

### 3 Terms and definitions

Delete entries 3.10 and 3.37.

Replace the existing terminological entries with the following:

#### 3.18

#### **A-weighted equivalent sound pressure level**

$L_{pAeq}$

level of a steady-state sound which, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound

#### 3.44

#### **maximum A-weighted sound pressure level**

$L_{pAEmax}$

maximum sound pressure level obtained when using standardized A-weighting and fast detector response time-weighting

#### 3.55

#### **pull or push toy**

toy that is intended to be pulled or pushed along the floor or ground

Note 1 to entry Toys intended for children aged 36 months and over are not regarded as pull or push toys.

Add the following new terminological entry:

#### 3.xx

#### **steady-state sound**

sound in which there are negligibly small fluctuations of sound pressure level within the period of observation

Replace the existing text of 4.29 with the following:

### 4.29 Acoustic requirements

See E.42.

When tested in accordance with 5.25 (Determination of sound pressure levels), toys that are designed to emit sound shall conform to the following requirements.

- a) The A-weighted equivalent sound pressure level,  $L_{pAeq}$ , of sounds produced by close-to-the-ear toys shall not exceed 65 dB.
- b) The A-weighted maximum sound pressure level,  $L_{pAFmax}$ , of toys where the sound is caused as a result of the movement imparted on the toy by the child (e.g. a toy vehicle with a sound-making mechanism attached to an axle) shall not exceed 85 dB.
- c) The A-weighted equivalent sound pressure level,  $L_{pAeq}$ , produced by all toys not covered by a) and b) above shall not exceed 85 dB.
- d) The C-weighted peak sound pressure level,  $L_{pCpeak}$ , produced by close-to-the-ear toys shall not exceed 110 dB.
- e) The C-weighted peak sound pressure level,  $L_{pCpeak}$ , produced by toys, other than close-to-the-ear toys and toys using percussion caps or other explosive action, shall not exceed 115 dB.
- f) The C-weighted peak sound pressure level,  $L_{pCpeak}$ , produced by toys using percussion caps or other explosive action shall not exceed 125 dB.
- g) If the C-weighted peak sound pressure level,  $L_{pCpeak}$ , produced by toys using percussion caps or other explosive action exceeds 115 dB, the potential danger to hearing shall be drawn to the attention of the user. See B.2.19 (Toys which produce high impulse noise).

The requirements in this subclause do not apply to:

- sounds produced by mouth-actuated toys where the sound pressure level is determined by the blowing action of the child (e.g. whistles and imitation musical instruments, such as trumpets and flutes);
- sounds such as those produced by xylophones, bells, drums and squeeze toys where the sound pressure level is determined by the muscular action of the child. This exemption does not apply to rattles, which are subject to the C-weighted peak requirement in 4.29 e);
- sounds produced by radios, MP3 players, CD players and other similar electronic toys where the sound output is dependent on the content of removable or re-writeable media such as discs, flash cards, or internet downloaded content;
- sounds produced by toys that are connected to or interfaced with non-toy external devices, such as televisions and computers, where the sound pressure level is determined by the external device;
- sound emitted from earphones/headphones;
- sounds produced by toys that reproduce or electronically or mechanically alter the child's voice, such as walkie-talkies, recording devices, megaphones and kazoos;
- sounds quantified by A-weighted equivalent sound pressure level,  $L_{pAeq}$ , produced by pull or push toys as a result of pulling or pushing. This exemption does not apply to sounds quantified by C-weighted peak sound pressure level,  $L_{pCpeak}$ , from pull or push toys; and
- sounds quantified by A-weighted equivalent sound pressure level,  $L_{pAeq}$ , produced by percussion caps or other explosive action.

Replace 5.25 with the following:

## 5.25 Determination of sound pressure levels

See 4.29 (Acoustic requirements)

### 5.25.1 General test conditions

### 5.25.1.1 General

This subclause contains general test conditions. The specific methods for particular toy categories are given in 5.25.2 (Specific test methods). If there are differences between the methods specified in this subclause and those in 5.25.2, the direction given in 5.25.2 shall be followed.

Unless contradicted by this procedure, the measurement procedures in either ISO 11201 or ISO 11202 shall be used.

### 5.25.1.2 Test environment

An environment that meets the qualification requirements of either ISO 11201 or ISO 11202 shall be used.

If using ISO 11201, the value of the correction factor  $K_{2A}$  shall be  $\leq 2.0$  dB. If using ISO 11202, the value of  $K_{3A}$  shall be  $\leq 4.0$  dB. When ISO 11202:2010 is used, the local environmental correction  $K_3$  shall be calculated using the actual distance between source and microphone,  $d$ , and not the minimum distance of 1 m as stated in Annex A of the document.

NOTE Caution should be used when selecting a testing environment. Typical furnished rooms may not meet the requirements of the above standards and could cause inaccurate results.

Sound reflections caused by test rigs used for the mounting of toys and/or the operator of the toy shall be minimized.

No correction needs to be applied to measurements taken where the background noise is 15 dB or more below the sound being measured. Measurements taken where the background noise is between 15 and 6 dB below the sound being measured shall be corrected by the method contained in ISO 11201 or equivalent. Environments with a higher background noise shall not be used.

### 5.25.1.3 Instrumentation

The instrumentation system, including the microphone and cable, shall meet the requirements of a class 1 instrument as specified in IEC 61672-1. When measuring high peak sound pressure levels, for example, from toys using percussion caps, the microphone and the entire instrumentation system shall have the capability of handling linear peak levels exceeding the C-weighted peak levels by at least 10 dB.

### 5.25.1.4 Microphone positions

Microphone positions are prescribed in 5.25.2 (Specific test methods). They shall all be evaluated with respect to finding the position with the highest sound pressure level, but complete measurements are only required for the position yielding the highest level. In practice, this often means that one microphone is moved from position to position. Whenever it is practicable, it is always an alternative to rotate the test object instead. Attention shall be paid to maintaining the correct measuring distance.

The sound pressure level shall be measured with the microphone reference direction oriented towards the dominant sound source. Generally, for free-field response microphones (calibrated for "normal incidence" to the microphone diaphragm), the axis of the microphone-preamplifier body should be oriented towards the dominant sound source.

### 5.25.1.5 Toy operation

Carry out the measurements on a new toy not already subjected to testing. Test battery toys using new primary batteries or fully charged secondary batteries. Test transformer toys with the transformer supplied with the toy. If the toy is supplied without a transformer, it shall be tested with the transformer recommended in the instructions. Normal operating mode(s) shall be reached before the tests are performed.

Operate the toy under test in that mode of its intended or foreseeable use that produces the highest sound pressure level to the microphone position, where the maximum sound level is observed. For toys that have a volume control, the volume shall be set at the maximum level. If the toy has features that allow it to fit into multiple categories in 5.25.2 (Specific test methods), it shall be tested per all applicable methods. For example, a pull or push toy that also has a button, intended to be pushed by

the child, that activates an electronic sound shall be tested to both the clauses for pull or push toys and floor toys.

If the toy under test has a clearly defined operating cycle, measure the A-weighted equivalent sound pressure level,  $L_{pAeq}$ , and the C-weighted peak sound pressure level,  $L_{pCpeak}$ , during at least one whole cycle. The completion of a whole cycle is intended to mean that all actions have been taken such that the toy is immediately ready to undergo another cycle. This may include acts such as winding, pumping or resetting. Cycles shall be completed as quickly as practical. If the operating cycle lasts less than 15 s it shall be repeated as quickly as possible and the measurement time shall be adapted to an integer number of operating cycles with a total duration of at least 15 s. If a toy has more than one clearly defined cycle, the cycle yielding the highest sound pressure level shall be used.

If the toy under test does not have a clearly defined operating cycle, measure the A-weighted equivalent sound pressure level,  $L_{pAeq}$ , and the C-weighted peak sound pressure level,  $L_{pCpeak}$ , for at least 15 s in the operational mode during which the sound pressure level is highest. For pass-by tests of push or pull toys, measure the C-weighted peak sound pressure level,  $L_{pCpeak}$ , as the toy passes the microphone. For pass-by tests of floor and tabletop toys that move along the table or floor, where the sound is caused as a result of the movement imparted on the toy by the child (e.g. a toy vehicle with a sound-making mechanism attached to an axle), measure the A-weighted sound pressure level,  $L_{pAFmax}$ , as well as the C-weighted peak sound pressure level,  $L_{pCpeak}$ , as the toy passes the microphone.

Toys that do not clearly fit in any of the categories listed in 5.25.2 shall be tested in the most appropriate way using the principles described in this subclause and those in 5.25.2.

## 5.25.2 Specific test methods

### 5.25.2.1 Close-to-the-ear toys

Mount close-to-the-ear toys in a test rig at least 100 cm above the reflecting plane or have them operated by an adult operator with the arm outstretched.

A-weighted equivalent sound pressure level,  $L_{pAeq}$ , measurements are to be made with the earpiece, if any, of the toy facing the microphone. The microphone shall be  $50 \pm 1$  cm from the earpiece. For toys without earpieces, locate the microphone  $50 \pm 1$  cm from the surface of the toy where the main sound source exists, such that the sound pressure level at the microphone is maximized.

C-weighted peak sound pressure level measurements,  $L_{pCpeak}$ , are to be made with the microphone  $50 \pm 1$  cm from the surface of the toy where the main sound source exists, such that the sound pressure level at the microphone is maximized.

Operate the toy as described in 5.25.1 (General test conditions). Conduct three trials. The highest observation for each respective measurement type ( $L_{pAeq}$ ,  $L_{pCpeak}$ ) is the measurement result.

### 5.25.2.2 Floor, table-top, and crib toys

Place stationary floor, table-top and crib toys on a standard test table as described in ISO 11202. A table with a wooden top with a thickness of 4 cm or larger and leg construction providing a stable test surface is considered sufficient. The table-top should be large enough such that, with the toy resting on and fully over the table-top, the side of the measurement box from which the measurement is being made is also above the table-top.

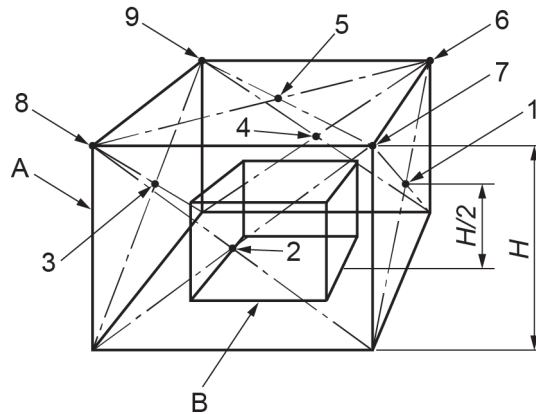
Mount self-propelled table-top and floor toys on the standard test table described above, in a test rig so that they can be operated with full power, but prevented from moving around. It is permissible to raise the toy up to 5 mm above the test table to allow for unrestricted movement (e.g. wheel rotation).

Test floor and table-top toys that move along the table or floor, where the sound is caused as a result of the movement imparted on the toy by the child (e.g. a toy vehicle with a sound-making mechanism attached to an axle), in accordance with the methods of 5.25.2.5 (Pull or push toys) instead of the methods given here. In addition to the  $L_{pCpeak}$  measurements specified in 5.25.2.5, measure the  $L_{pAFmax}$  for both trials.



Microphone positions are on a hypothetical box-shaped measurement surface. Each side of the measurement surface is separated by  $(50 \pm 1)$  cm from the nearest side of the reference box, with the exception of the bottoms of both the measurement and reference boxes, which lie in the same plane as the table-top. For toys where all dimensions are  $\leq 100$  cm, there are five microphone locations, one at the centre of each side of the measurement surface, not including the bottom side. For toys with a dimension  $> 100$  cm, there are four additional microphone locations at the upper corners of the measurement surface (see Figure X).

Operate the toy as described in 5.25.1 (General test conditions). Conduct three trials. The highest observation for each respective measurement type ( $L_{pAeq}$ ,  $L_{pCpeak}$ ) is the measurement result.



#### Key

A measurement surface

B reference box

H height of the box-shaped measurement surface

1-5 basic microphone positions

6-9 additional microphone positions for large toys

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**Figure X — Microphone positions for measurement of stationary and self-propelled floor, table-top and crib toys**

#### 5.25.2.3 Hand-held toys other than rattles

Mount hand-held toys in a suitable test fixture at least 100 cm above the reflecting plane or have them operated by an adult operator with the arm outstretched

Microphone positions are on a hypothetical box-shaped measurement surface (see Figure XX). The sides of the measurement surface are separated by  $(50 \pm 1)$  cm from the nearest side of the reference box. There are six microphone locations, one at the centre of each side of the measurement surface.

Operate the toy as described in 5.25.1 (General test conditions). Conduct the test three times. The highest observation for each respective measurement type ( $L_{pAeq}$ ,  $L_{pCpeak}$ ) is the measurement result.