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Varovala sluha - Preskušanje - 1. del: Fizikalne preskusne metode

Hearing protectors - Testing - Part 1: Physical test methods

Gehörschützer - Prüfung - Teil 1: Physikalische Prüfverfahren

Protecteurs individuels contre le bruit - Essais - Partie 1: Méthodes d'essai physique

Ta slovenski standard je istoveten z: prEN 13819-1

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1: Méthodes d'essai physique

Gehörschützer - Prüfung - Teil 1: Physikalische
Prüfverfahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 159.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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European foreword

This document (prEN 13819-1:2017) has been prepared by Technical Committee CEN/TC 159 “Hearing protectors”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13819-1:2002.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

In comparison with the previous edition, the following technical modifications have been made:

- Figures: All figures revised and clarified where necessary.
- Flowcharts for test procedures revised and additional ones added for single tests.
- 4 Scope widened for earmuffs attached to head protection and/or face protection devices
- 4.2.2.2 Test headforms updated on EN 960:2006
- 4.2.2.3 Pinna simulators: Allow for 3D printing
- 4.2.3.2.2 New term defined: maximum external vertical distance
- Figure 4 and 7 Error corrected: 5° instead of 15°
- Table 3 Requirements changed
- 4.13 and 5.6 Changes and relaxations on the requirements for the equipment for ignitability testing: form of steel rod and temperature measuring device
- 5.1.3 Clarification on testing scheme
- 5.2.3 Clarification for flanged earplugs
- Tables 6 and 7 Error in title corrected
- Figure 9 of EN 13819-1:2002 deleted
- Annex ZA of EN 13819-1:2002 deleted

NOTE The technical changes referred to include the significant technical changes from the EN revised but is not an exhaustive list of all modifications from the previous edition.

Introduction

This standard for "*Hearing Protectors — Testing — Part 1: Physical test methods*", specifies procedures for the testing of personal hearing protection devices in relation to Regulation (EU) 2016/425 - Personal Protective Equipment.

A family of standards EN 352 describes product requirements of hearing protectors:

- *Part 1: Earmuffs*
- *Part 2: Earplugs*
- *Part 3: Earmuffs attached to head protection and/or face protection devices*
- *Part 4: Level-dependent earmuffs*
- *Part 5: Active noise reduction earmuffs*
- *Part 6: Earmuffs with safety-related audio input*
- *Part 7: Level-dependent earplugs*
- *Part 8: Entertainment audio earmuffs*
- *Part 9: Earplugs with safety-related audio input*
- *Part 10: Earplugs with entertainment audio input*

Test methods for these requirements are described in the family of standards EN 13819:

- *Part 1: Physical test methods*
- *Part 2: Acoustic test methods*
- *Part 3: Supplementary acoustic test methods*

An associated standard EN 458 covers selection, use, care and maintenance of hearing protectors.

This standard is intended as a supplement to the specific product standards for hearing protectors.

The performance requirements are given in the hearing protector product standard.

If deviations from the procedures specified in this standard are necessary, these deviations are specified in the hearing protector product standard (relevant part of the EN 352 series).

1 Scope

This European Standard EN 13819-1 specifies physical test methods for hearing protectors. The purpose of these tests is to enable assessment of the performance of the hearing protector as specified in the appropriate product standard.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 352-1:2002, *Hearing protectors - General requirements - Part 1: Ear-Muffs*

EN 352-2:2002, *Hearing protectors - General requirements - Part 2: Ear-plugs*

EN 352-3:2002, *Hearing protectors - General requirements - Part 3: Ear-muffs attached to an industrial safety helmet*

EN 960:2006, *Headforms for use in the testing of protective helmets*

EN 13819-2:2002, *Hearing protectors - Testing - Part 2: Acoustic test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions given in EN 352-1, EN 352-2, EN 352-3 and the following apply.

3.1

headband earmuffs

earmuffs satisfying the requirements of EN 352-1

3.2

mounted earmuffs

earmuffs fitted to a carrier (head or face protection device) such that the combination satisfies the requirements of EN 352-3

3.3

test height

vertical distance between the axis through the centres of the mounting holes of the pinna simulators in the mounting fixture or test headform shown in Figures 4 or 5a respectively, and the top of the headband support pad or headform

Note 1 to entry: The dimensions given in Tables 1, 2, 3, 4, 5, 6 and 7 correspond with the definitions given in 3.3, 3.4 and 3.5 (as appropriate).

3.4

test width

horizontal distance between the vertical axes through the centres of the mounting holes for the pinna simulators in the mounting fixture or test headform shown in Figure 4 or 5a respectively

Note 1 to entry: The dimensions given in Tables 1, 2, 3, 4, 5, 6 and 7 correspond with the definitions given in 3.3, 3.4 and 3.5 (as appropriate).

prEN 13819-1:2018 (E)**3.5****test depth**

vertical distance between the axis through the centres of the mounting holes of the pinna simulators and the top of the headband support, with the pinna simulators attached with their shorter axes vertical shown in Figure 5c

Note 1 to entry: The dimensions given in Tables 1, 2, 3, 4, 5, 6 and 7 correspond with the definitions given in 3.3, 3.4 and 3.5 (as appropriate).

3.6**external vertical distance**

vertical distance between the top of the test headform on which the helmet is mounted and the highest point on the outside surface of the helmet shell

4 Earmuffs**4.1 Specimens, conditioning and scheme of testing****4.1.1 Specimens**

Headband earmuffs and mounted earmuffs shall be submitted for testing in the condition in which they are offered for sale.

For headband earmuffs, 10 specimens shall be submitted and they shall be numbered 1 to 10.

For mounted earmuffs, 10 basic combination specimens (earmuffs and carriers (e.g. helmets)) shall be submitted and they shall be numbered 1 to 10 (basic).

If the same model of mounted earmuffs is to be tested with another model or size of carrier, 6 further supplementary combination specimens (earmuffs and carriers) for each model or size of carrier shall be submitted. These shall be numbered (in sets) 1 to 6 (supplementary).

4.1.2 Conditioning and testing atmosphere

All specimens shall be conditioned and tested in an atmosphere having a temperature of $(22 \pm 5) ^\circ\text{C}$ and a relative humidity of not more than 85 %, unless required otherwise by the test procedure.

4.1.3 Scheme of testing

4.1.3.1 The 10 headband earmuffs shall be conditioned and tested in accordance with 4.1.3.2 to 4.1.3.10 and Figure 1 (and if applicable Figure 3).

For mounted earmuffs, except as specified in the following paragraph, the scheme of testing for the 10 basic combination specimens and, if applicable, the sets of 6 supplementary combination specimens, shall be as given in 4.1.3.2 to 4.1.3.10 and Figure 2a and b (and if applicable Figure 3).

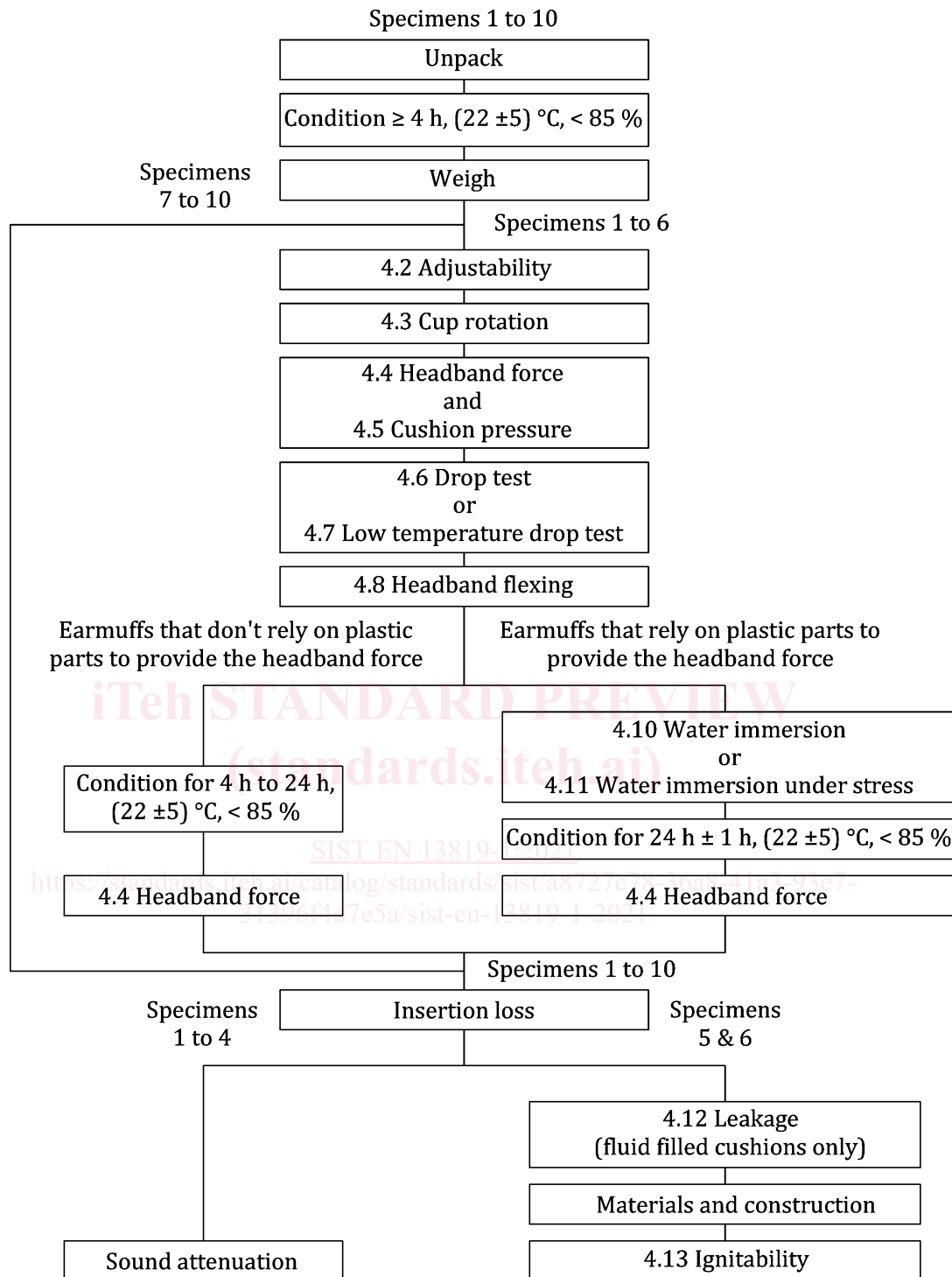
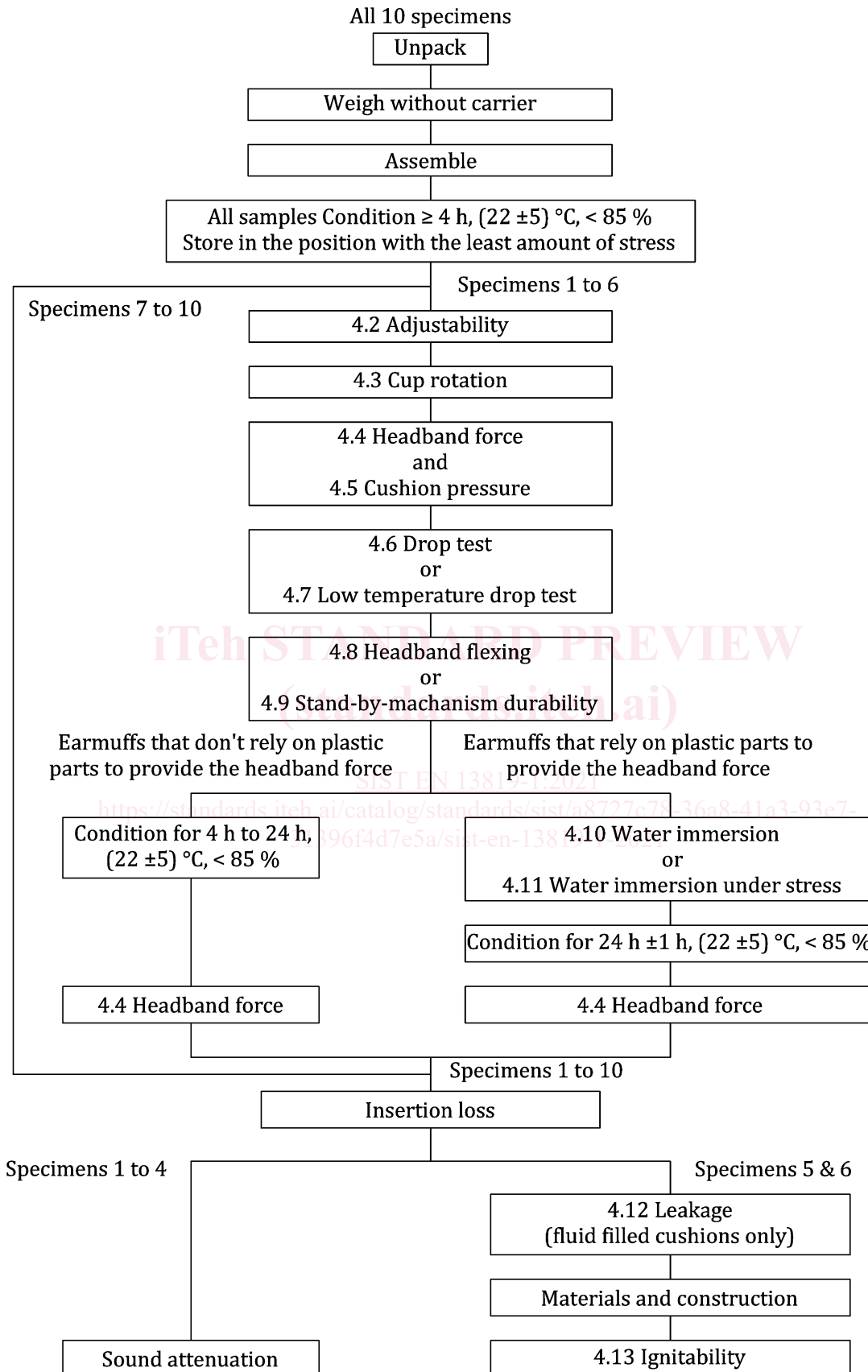


Figure 1 — Testing scheme flow chart for headband earmuffs



a) basic combinations

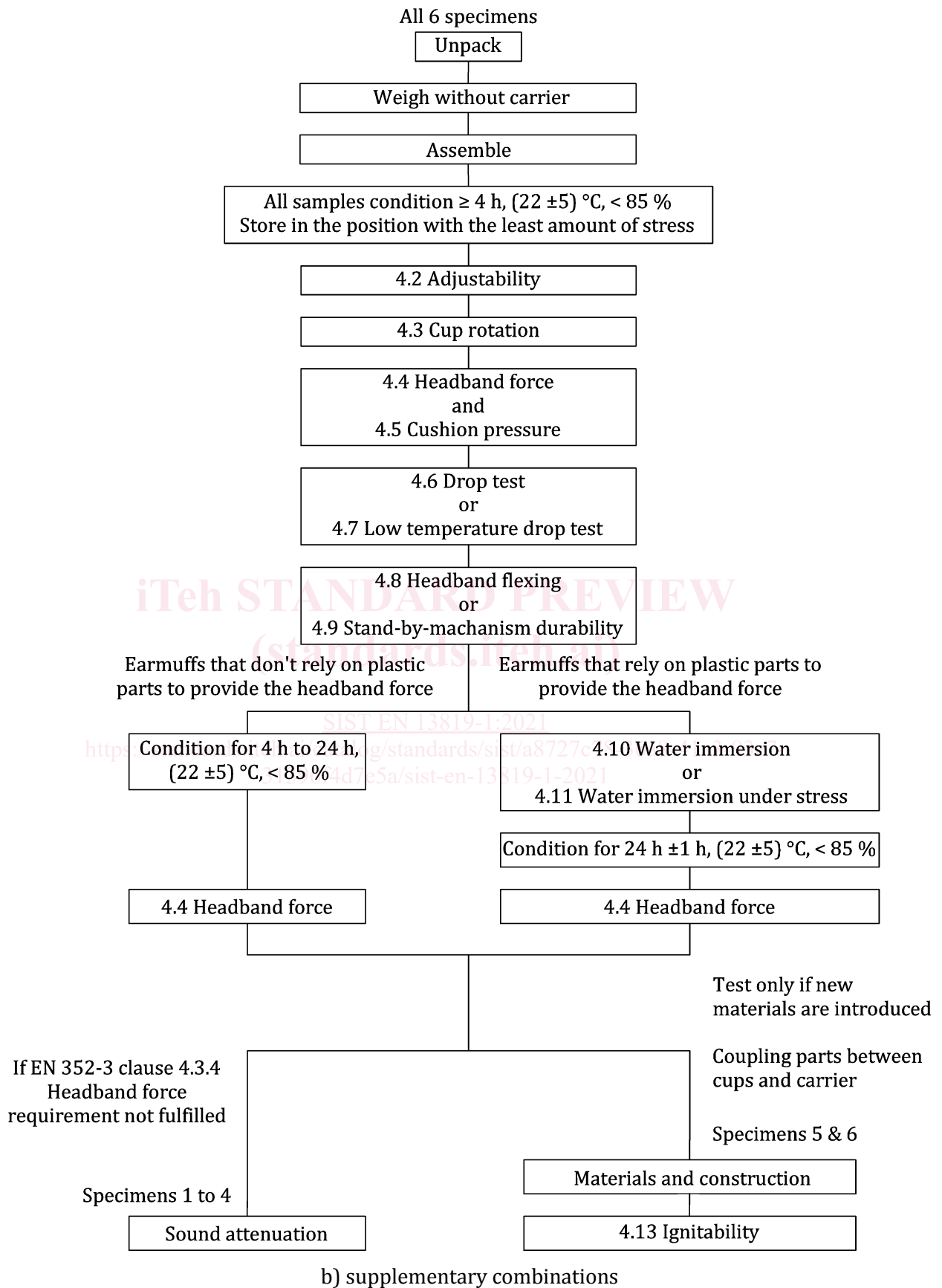


Figure 2 — Testing scheme flow chart for mounted earmuffs

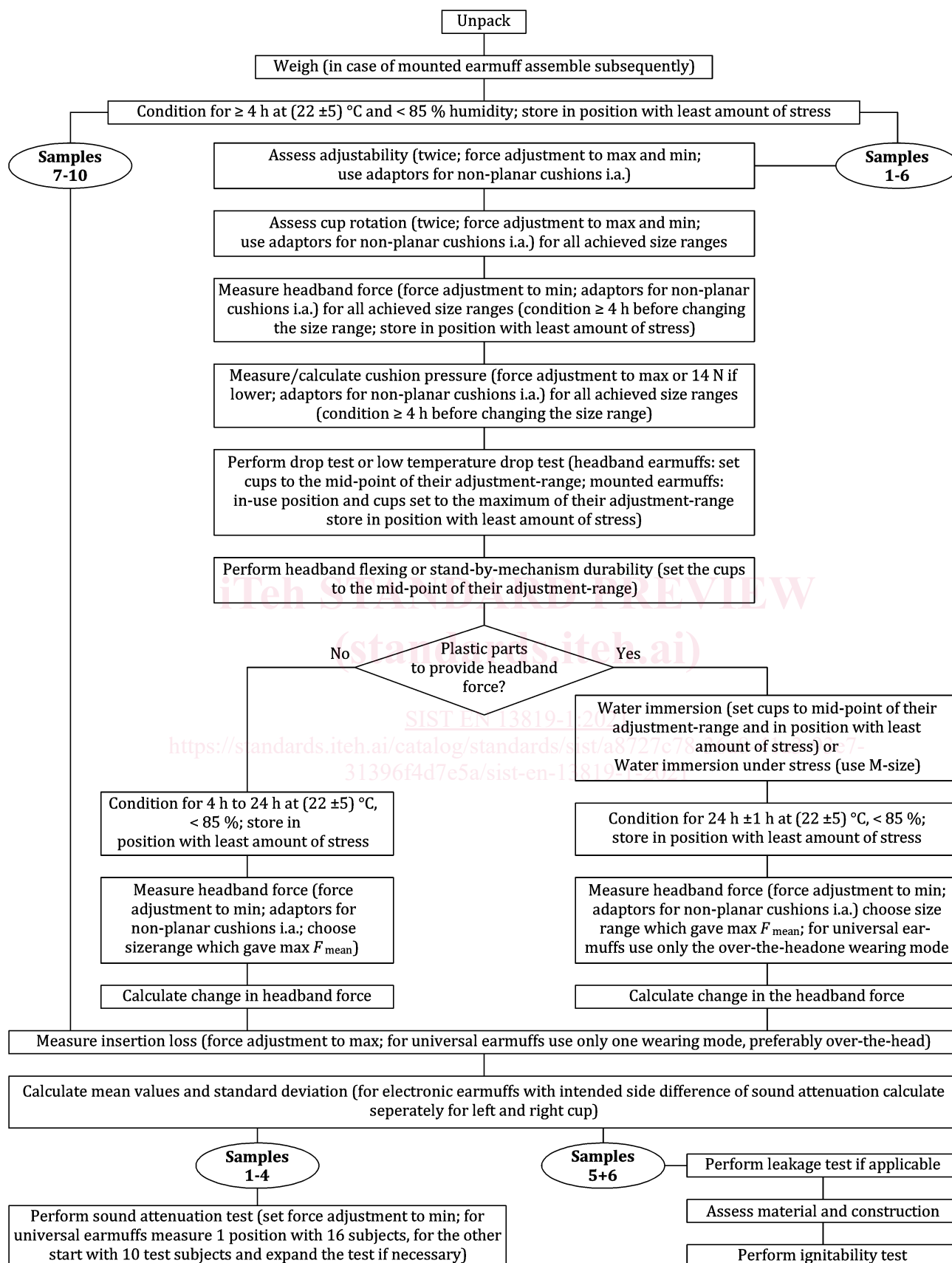


Figure 3 — Testing scheme flow chart for earmuffs with adjustable headband force (headband and mounted earmuffs); i.a.: if applicable

In the case of carriers supplied in more than one size, one selected size shall be used for testing in a basic combination (except for sound attenuation testing). All other carrier sizes shall be tested in a supplementary combination (except for sound attenuation testing). Sound attenuation testing shall be performed using the complete range of available carrier sizes (see EN 13819-2). If the mounted earmuff incorporates a means to adjust the headband force, the force shall be adjusted to its minimum setting for all stages of conditioning and testing, unless otherwise specified.

Testing may be discontinued in the event of a specimen failing to satisfy the respective requirement.

4.1.3.2 Unpack all earmuffs completely. For products fitted with batteries, the testing is to be performed with batteries (except for water immersion and ignitability).

4.1.3.3 For headband earmuffs, each specimen shall be weighed and the mean mass of the 10 specimens shall be reported to the nearest gram.

4.1.3.4 For mounted earmuffs, each specimen (left and right earmuff without the carrier) shall be weighed and the mean mass of the 10 specimens shall be reported to the nearest gram.

4.1.3.5 In the case of mounted earmuffs, the earmuffs shall be attached to the carriers in accordance with the earmuffs manufacturer's instructions. The cups/support arms shall be set to the position with the least amount of stress (in-use, stand-by, parking etc.).

4.1.3.6 All specimens shall be conditioned for a minimum of 4 h in the atmosphere specified in 4.1.2.

4.1.3.7 The scheme of testing for specimens 1 to 6 (headband earmuffs and mounted earmuffs, basic and supplementary sets) shall be as follows:

- a) Test each specimen in accordance with 4.2, 4.3, 4.4 and 4.5;
- b) Test each specimen in accordance with 4.6, unless (optional) 4.7 is to be performed;
- c) Optionally, test each specimen in accordance with 4.7;
- d) Test each specimen in accordance with 4.8 or, if the specimens are mounted earmuffs which incorporate a stand-by position, test in accordance with 4.9 (includes support arm flexing);
- e) For earmuffs which rely on plastic parts to provide the headband force, test each specimen in accordance with 4.10 or 4.11;
- f) If 4.10 or 4.11 were performed, remove each specimen from the water bath noting the time of removal and re-fit the cups (if removed). Remove excess water. If the liners were removed, re-fit them;
- g) Condition each specimen for $(24 \text{ h} \pm 1) \text{ h}$, measured from the time of removal from the water bath in h) or in case of earmuffs which do not rely on plastic parts to provide the headband force condition each specimen for 4 to 24 h, measured from the end of the headband flexing in d), under the conditions specified in 4.1.2, and then immediately measure the headband force in accordance with 4.4;

NOTE For multiple size range models, use only the setting of width and height which gave the highest headband force in 4.4;

- h) For mounted earmuffs set the cups/support arms to the mid-point of the range of their adjustment, set in the position with the least amount of stress (in-use, stand-by, parking etc.).

4.1.3.8 The scheme of testing for all 10 headband earmuffs specimens or, in the case of mounted earmuffs, all 10 basic specimens, shall be continued as follows: