ISO 532-3:2023-07 (E)

Acoustics - Methods for calculating loudness - Part 3: Moore-Glasberg-Schlittenlacher method

Contents

Page

Foreword iv

Introduction v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 1

4 General 4

5 Input signal 4
5.1 Single microphone 4
5.2 Two microphones in the ear canals or microphones in a head and torso simulator 4
5.3 Earphone presentation 4

6 Instrumentation 5

7 Description of the method 5
7.1 General 5
7.2 Transfer of sound through the outer and middle ear 6
7.2.1 General 6
7.2.2 Free-field transfer function 7
7.2.3 Diffuse-field transfer function 8
7.2.4 Signal recorded using microphones in the ear canals or using a Head and Torso Simulator 8
7.2.5 Earphone presentation 8
7.3 Calculation of the running short-term spectrum 8
7.4 Calculation of the running short-term excitation pattern 9
7.5 Transformation of excitation into specific loudness 10
7.5.1 General 10
7.5.2 Reference excitation at the reference threshold of hearing 10
7.5.3 Gain of the cochlear amplifier for inputs with low sound pressure levels 11
7.5.4 Calculation of specific loudness from excitation when ETHRQ/E0 E/E0 11
7.5.5 Calculation of specific loudness from excitation when ETHRQ/E0 > E/E0 12
7.5.6 Calculation of specific loudness from excitation when E/E0 > 1010 12
7.6 Calculation of short-term specific loudness 13
7.7 Smoothing of short-term specific loudness and application of binaural inhibition 13
7.8 Calculation of short-term loudness 15
7.9 Calculation of long-term loudness 15
7.10 Relationship between loudness level and loudness 15
7.11 Calculation of the reference threshold of hearing 16

8 Uncertainty of calculated loudness sounds 17

9 Data reporting 17

Annex A (informative) Software for the calculation of loudness according to the method in this document 19

Annex B (informative)Testsignalsusedforverificationofthisdocument 21

Annex C (informative)TestsignalsusedforverificationofequivalencewithISO532-2 24

Bibliography 28