

DIN EN ISO 3740:2019-08 (E)

Acoustics - Determination of sound power levels of noise sources - Guidelines for the use of basic standards (ISO 3740:2019)

Contents	Page
European foreword	4
Foreword	5
Introduction	6
1 Scope	8
2 Normative references	8
3 Terms and definitions	8
4 Sound power level	14
4.1 Basic information	14
4.2 Reasons for the determination of sound power levels	14
4.3 Basic procedures for determining sound power levels	14
4.4 Quality of determined sound power levels	15
4.5 Noise emission declaration	15
5 Selection of the most appropriate method in the set of standards	16
5.1 Methods and quantities to be measured and determined	16
5.2 Considerations affecting the selection of a measurement method	16
5.3 Test environment	24
5.4 Selection of basic standards appropriate for measurements in laboratory rooms and special test rooms	24
5.4.1 General	24
5.4.2 Acoustical requirements on the sound field in laboratories and special test rooms	24
5.4.3 Background noise limitation	24
5.5 Selection of basic standards appropriate for in-situ measurements	25
5.5.1 General	25
5.5.2 Hemi-anechoic sound field check	26
5.6 Determination of high-frequency sound power levels	27
Annex A (informative) Basic International Standards specifying methods for determining sound power levels of machines, equipment and products -- Main facts and requirements	28
Annex B (informative) Acoustical test environments	30
B.1 Environments provided by acoustic test laboratories	30
B.1.1 General	30
B.1.2 Reverberation test rooms	30
B.1.3 Special reverberation test rooms	30
B.1.4 Anechoic and hemi-anechoic test rooms	30
B.2 Environments in situ	31
B.2.1 Precision method (accuracy grade 1)	31
B.2.2 Engineering methods (accuracy grade 2)	31
B.2.3 Survey methods (accuracy grade 3)	31
Annex C (informative) Measurement uncertainty	32
C.1 General aspects	32

C.2	Determination of the expanded measurement uncertainty	34
Annex D (informative) Case studies	35	
D.1	General	35
D.2	Case study 1 -- Application of ISO 3744 under free-field (outdoors) conditions -- Measurement setup and source	35
D.3	Case study 2 -- Application of ISO 3744 under in situ conditions -- Measurement setup and sound source	37
D.4	Case study 3 -- Application of ISO 3746 under in situ conditions -- Measurement setup and sound source	39
Bibliography	41	
Figures	Figure 1 -- Flowchart guiding the selection of appropriate International Standards for the determination of sound power levels	17
	Figure 2 -- Flowchart guiding the selection of International Standards for the determination of sound power levels appropriate for in situ measurements	26
	Figure C.1 -- Flowchart to assist determining OMC, together with a guideline for the selection of the appropriate grade of accuracy	33
	Figure D.1 -- Top view on the hemispherical measurement surface surrounding the reference box and showing the measurement positions	35
	Figure D.2 -- Top view on the parallelepiped used as measurement surface surrounding the reference box and showing the measurement positions	37
	Figure D.3 -- Top view on the parallelepiped used as measurement surface surrounding the reference box and showing the measurement positions	39
Tables	Table 1 -- Overview of International Standards for the determination of sound power levels of machines, equipment and products using sound pressure	19
	Table 2 -- Overview of International Standards for the determination of sound power levels of machines, equipment and products applying sound intensity measurements	21
	Table 3 -- Overview of International Standards for the determination of sound power levels of machines, equipment and products using vibration measurement	23
	Table 4 -- Applicability of different methods taking into account the background noise level	26
	Table A.1 -- Basic International Standards specifying various methods for determining sound power levels of machines, equipment and products	28
	Table C.1 -- Coverage factor for different confidence levels during one-sided and two-sided tests ..	34
	Table D.1 -- Case study 1 -- Application of ISO 3744 under free field conditions	36
	Table D.2 -- Application of ISO 3744 under in situ conditions	37
	Table D.3 -- Application of ISO 3746 under in situ conditions	39