KTH Engineering Sciences

Determination of
Speech level reduction according to ISO 23351:2020

Object:
Abstracta ZEN POD

Technical Note no.:	20220105.1
Customer	Abstracta
Report author:	Lars Wester, LW decibel ab
Signature:	
Report reviewed:	Mats Knutsson, LW decibel ab
Signature:	
Measurements carried out by:	Lars Wester, LW decibel ab
Measurement results reviewed by:	Mats Knutsson, LW decibel ab

Address
MWL, KTH Aeronautical and Vehicle Engineering
S-100 44 Stockholm, SWEDEN

Visiting address
Teknikringen 8
Stockholm

Telephone
Lars Wester,
LW decibel ab
+46 702 355 822

Internet
www.ave.kth.se

1. General information

The measurements have been carried in conformity with ISO23351:2020.
Measurement date and time: 2021-12-20 and 21.

2. Test environment and test specimen

The test room meets the requirements on diffusion of sound field according to ISO354:2003 6.1.3 and Annex A. Controlled December 2020
The Sound Absorption Area for the empty test room meets the requirements according to ISO354:2003 6.1.4. Controlled December 2020

Test room nr 81
Room Volume 244 m^3
Room surface area 235 m^2

Measurement	Temperature	Relative humidity	Static pressure
T_0 and A_0	19,0°C	23,0%	1018 bar
T_1 and A_1	18,9°C	22,9%	1019 bar
L_{W0}	19,1°C	23,2%	1018 bar
L_{W1}	19,3°C	23,4%	1018 bar

Description of the test specimen:

1. Manufacturer
2. Type
3. Parts of the test specimen
4. External dimensions
5. Thickness and description of sound absorbing and sound insulating material layers
    a. Layer 1
    b. Layer 2
    etc.

Address
MWL, KTH Aeronautical and Vehicle Engineering
S-100 44 Stockholm, SWEDEN

Visiting address
Teknikringen 8
Stockholm

Telephone
Lars Wester,
LW decibel ab
+46 702 355 822

Internet
www.ave.kth.se

The test objects were positioned inside the reverberation room according to below:

Abstracta
ZENPOD

Measurement of L_{W1}


Picture 1 and 2: Test Object in the test room. 2 positions for L_{W1} measurements
All in all 2 object positions and 8 microphone positions for each one of these

Measurement of L_{W0}


Picture 3 and 4: Loudspeaker and Microphones for L_{W0} measurements
All in all 2 loudspeaker positions and 8 microphone positions for each one of these.

Measurement of T_0 and T_1


Mesurement of T_0 and T_1 according to ISO354.

Address
MWL, KTH Aeronautical and Vehicle Engineering
S-100 44 Stockholm, SWEDEN

Visiting address
Teknikringen 8
Stockholm

Telephone
Lars Wester,
LW decibel ab
+46 702 355 822

Internet
www.ave.kth.se

3. Instrumentation

Dynamic signal analyser Data Translation DT9837A
Software Spectra Plus DT
Microphone 1 B&K Type 4942-A-021 Serial No: 2360828
Microphone 2 BSWA MP201 Serial No: 560130
Microphone 3 B&K Type 4942-A-021 Serial No: 2360830
Microphone 4 B&K Type 4942-A-021 Serial No: 2360845
Power Amplifier B&K Type 2706
Climate sensor "Klima Series"; Temperature, Relative humidity, and pressure
Omni directional loudspeaker
Calibrator Bedrock 86065
System Calibration for all four microphones carried out at 8.30 am 2020-12-21 and 5.45 pm 2020-12-22.

4. Acoustical data

Reverberation times T0 and T1 were measured using 4 different microphones and one omni directional loudspeaker in 3 different positions according to drawing 1.

Object positions, loudspeaker positions, microphone positions and number of microphone positions:
L_{W0} and measurements 2 loudspeaker positions and 8 microphone positions for each one of these

L_{W1} 2 object positions with the loudspeaker inside and 8 microphone positions for each one of these

The results are only valid for tested specimen configuration. Change in size, geometry or materials can lead to significant changes in reported results.

Address
MWL, KTH Aeronautical and Vehicle Engineering
S-100 44 Stockholm, SWEDEN

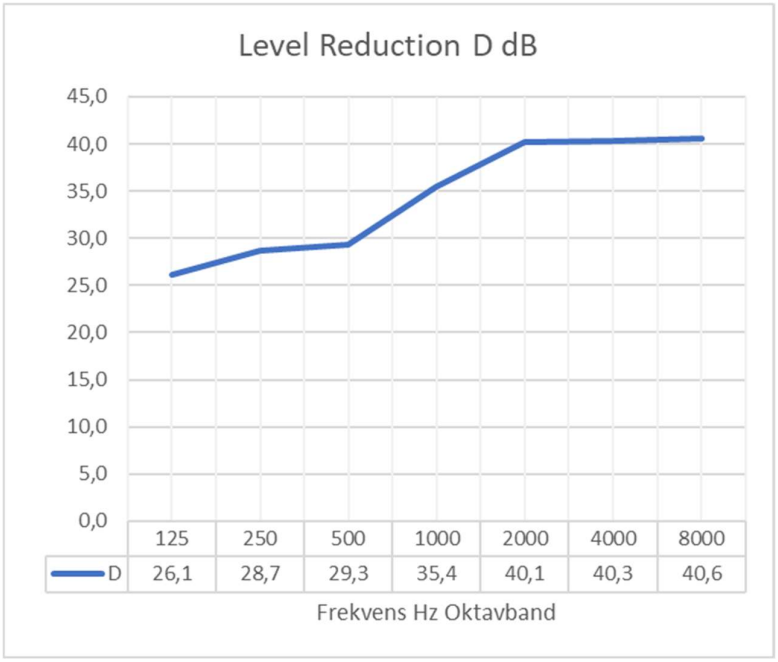
Visiting address
Teknikringen 8
Stockholm

Telephone
Lars Wester,
LW decibel ab
+46 702 355 822

Internet
www.ave.kth.se

Measurement Results

Abstracta ZENPOD

Level reduction **Speech level reduction** **$D_{S,A}$ = 30,8 dB** **Class: A**	

Address
MWL, KTH Aeronautical and Vehicle Engineering
S-100 44 Stockholm, SWEDEN

Visiting address
Teknikringen 8
Stockholm

Telephone
Lars Wester,
LW decibel ab
+46 702 355 822

Internet
www.ave.kth.se