


THE ANECHOIC OR SEMI-ANECHOIC ROOMS

Technical data sheet nr 101A-a

Purpose :

There are many methods to define the sound power of machines. The method in anechoic room is especially a favourable one, to evaluate the acoustic dispersion of the sources that produce a continuous noise and for which we can get data on the source directivity.

NF EN ISO 3745 STANDARD
Definition of the sound power produced by the noise sources

Laboratory methods in anechoic or semi-anechoic rooms

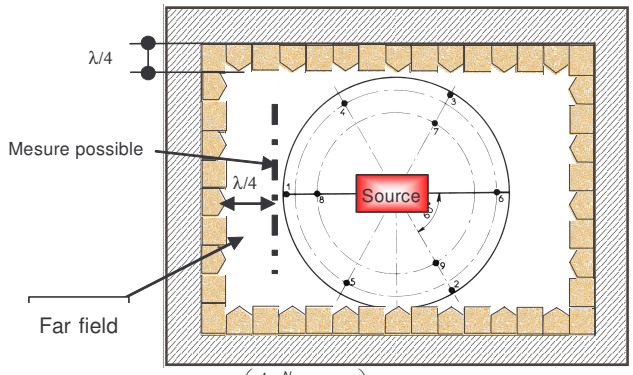
Standard application fields :
Sound sources with a volume < 0.5% testing room volume

Background noise criterion :
The sound level to be measured – 6 dB for each frequency band

Room volume criterion :
Testing room volume = 200* volume of the source to be tested

Sound absorption criterion in the representative frequency bands :
Sound absorption factor with normal incidence : 0.99
In semi-anechoic room with normal incidence : 0.06

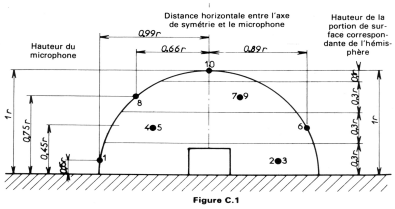
Microphone location :
Measurement radius = 2*the largest dimension of the source



$$\overline{L_p} = 10\log\left(\frac{1}{N}\sum_{1}^{N} 10^{0.1L_{pi}}\right)$$

où L is the pressure level per band, in Db

N is the total quantity of measurements



$$L_w = \overline{L_p} + 10\log\frac{S_1}{S_0} + C$$

où $\overline{L_p}$: The sound pressure level at the measure surface of the testing sphere, in dB

S_1 : = 4 πr² is the testing sphere area (radius r), in square meters

S_0 : = 1 m²

C : Is the correction term for the temperature influence θ (in Celsius degrees) and the atmospheric pressure p (in millibars)

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METHODOLOGICAL APPROACH

The sound impact assessment may include the following steps :

Stresses analysis
Operation
Access
Use

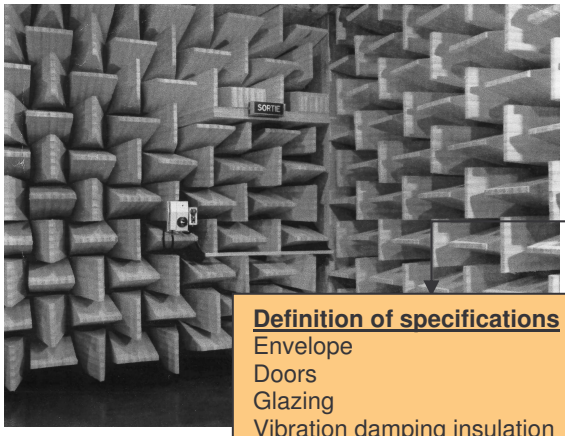
Measurement analysis
Sound level meters
Dose-rate measuing
Holography, Antenna
Vibrations

Useful data
Sound and vibratory levels outside the testing rooms
Sound and vibratory levels to be measured in the room
Minimum acceptable sound and vibratory levels outside the rooms
Elements to be tested
Dimensions inside the room

Measurement modification

Survey
Insulation
Absorption
Sound decrements

Stresses modification



yes

In compliance with the standard

no

Definition of specifications
Envelope
Doors
Glazing
Vibration damping insulation
Ventilation
Sound absorptive materials
Lighting

Stresses acceptance

BENEFITS :

. Integration of all the criteria and parameters before the realization of the anechoic room, for a better design trade-off

. The specifications are elaborated with the help of dBVib INSONORISATION, specialized in turnkey solutions, to design and improve the acoustics of your projects and installations.

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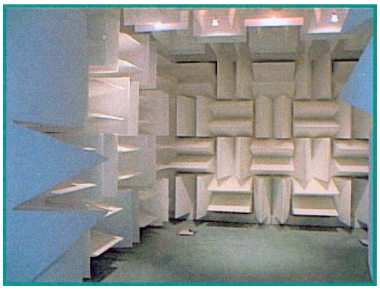
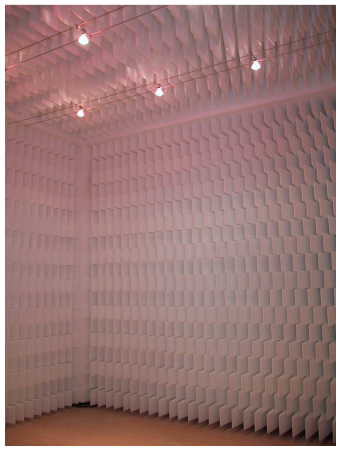
L'expertise "dynamique"

REFERENCES

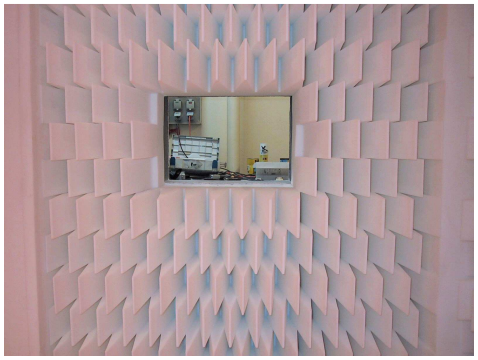
Semi-anechoic rooms

- Esswein *La Roche sur Yon*
- THOMSON *Moulins*

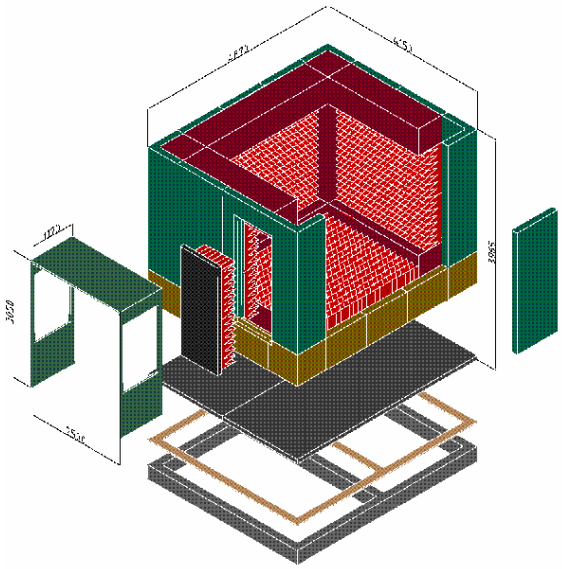


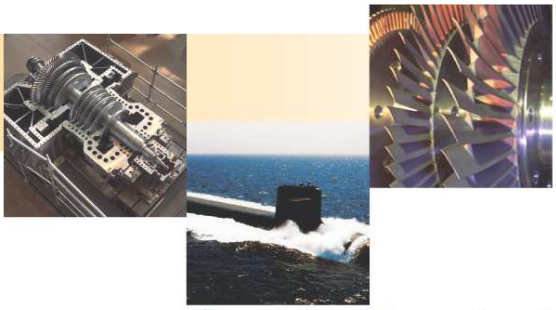


- Schneider *Grenoble*
- ESTACA



- ENSAM *Paris*
- Pôle NVH Renault in *Lardy* (3 rooms)





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