

NS3 ACOUSTIC INSULATION Module

Building's airborne and impact sound insulation

Classification of buildings sound insulation performances

The **ACOUSTIC INSULATION** module of Noise Studio allows to perform the calculation of airborne sound insulation, impact noise and sound absorption indices from measurements made with Delta Ohm sound level meters. Calculations are performed in accordance with international standards and national regulations. A comparison function allows to superimpose the measured data with literature data contained in a walls and floors database. Noise Studio NS3 also allows to perform the classification of acoustic insulation performance of buildings according with the UNI 11367/10 technical regulation

Reference Standards: ISO 140-3-4-5-6-7-8 and ISO 717-1-2, ISO 3382-1-2, ISO 354, D.P.C.M. 05/12/1997, UNI 11367/2010

- ◆ Vertical and horizontal partitions airborne sound insulation
- ◆ Facade sound insulation
- ◆ Impact noise level
- ◆ Noise immissions from service equipments with continuous operation
- ◆ Noise immissions from service equipments with discontinuous operation
- ◆ Acoustic classification by acoustic descriptor and by housing unit
- ◆ Overall acoustic classification of housing units
- ◆ Type of housing units: *residential, hospitals, schools, hotels*
- ◆ Evaluation of background noise contribution on continuous and discontinuous service equipments measurements
- ◆ Extended uncertainty on measurements
- ◆ Processing of data obtained from sampling of single measurements and uncertainty calculation
- ◆ Editing of sound pressure level decays
- ◆ T60 calculation using both steady noise interruption and impulse response integration techniques
- ◆ Walls and floors database for experimental - theoretical data comparison
- ◆ Direct printing of reports according to ISO 717
- ◆ Possibility to insert buildings layout in bitmap format
- ◆ Direct sound level meter setup using Noise Studio NS3

Main descriptors

- ◆ R, R' (ISO 140/4)
- ◆ L_n, L'_{nT}, L'_{nT} (ISO 140/7)
- ◆ $D_{2m,nT}, D_{nT}, D_n, D_{tr,2m,nT}, D_{tr,2m,n}, D_{Is,2m,nT}, D_{Is,2m,n}, R'_{45}, R'_{tr,s}$ (ISO 140/5)
- ◆ L_{ic}
- ◆ L_{id}
- ◆ **Alpha Coeff.** (ISO 354)
- ◆ **Eq.Absorption Area**
- ◆ **EDT, T10, T20, T30, T60**

Index $R_w(C;Ctr)$	Correction	Result
47 (-1, 0)	<input checked="" type="radio"/> None <input type="radio"/> C <input type="radio"/> Ctr	47

Category	R_w (*)	$D_{2m,nT,w}$	$L_{n,w}$	LASmax	LAEq
E	50 dB	48 dB	58 dB	35 dB	25 dB
A, C	50 dB	40 dB	63 dB	35 dB	35 dB

(*) R_w values referred to separation elements between two different units

Housing Environment Classification

Category A: residence or comparable buildings
 Category B: offices or comparable buildings
 Category C: hotels, boarding houses or comparable activities buildings
 Category D: hospitals, clinics, nursing home or comparable buildings
 Category E: any level school activities or comparable buildings

- ◆ Sound decay editing
- ◆ Acoustic classification
- ◆ In situ measurements
- ◆ Walls and floors database
- ◆ Acoustic absorption
- ◆ Input and editing of bitmaps

EMITTING ROOM

- Section 4 - ...\Appartamento A misura 1.d5
- Section 5 - ...\Appartamento A misura 1.d5
- Section 6 - ...\Appartamento A misura 1.d5
- Section 7 - ...\Appartamento A misura 1.d5
- Section 8 - ...\Appartamento A misura 1.d5

RECEIVING ROOM

- Section 11 - ...\Appartamento A misura 1.d5
- Section 12 - ...\Appartamento A misura 1.d5
- Section 13 - ...\Appartamento A misura 1.d5
- Section 14 - ...\Appartamento A misura 1.d5

Correction factor

Average Reverberation Time: rev [s] View

Calculate Average Rev. Time

Surface (m²) Volume (m³)

Index R' [dB]	100	125	160	200	250	315	400	500	630	800	1k	1.2k	1.6k	2k	2.5k	3.1k	4k	5k	6.3k	8k
Index R' [dB]	46.3	47.0	49.0	48.0	50.6	47.0	48.6	45.3	47.6	48.1	48.0	47.0	43.8	45.7	47.9	46.4	46.2	46.1	48.3	46.0

Evaluate Index $R'_w(C;Ctr)$

47 (-1,0) dB

Class 4

Display

- INDEX
- SOURCE ROOM
- RECEIVING ROOM
- Ampli ON
- Background
- REC - BGND
- AREA ABSORP.

Lev. [dB] - SPECTRA AVG

All essential informations are grouped in a single and versatile post processing screen

Isolamento per via aerea tra ambienti secondo ISO 140-4
 Analisi - Misure di isolamento acustico in edifici e di elementi di edificio

Cliente

Nome: _____ Indirizzo: _____ Città: _____
 C.A.P.: _____ Prov.: _____ Data della prova: _____
 C. I.P. / IVA: _____

Analizzatori

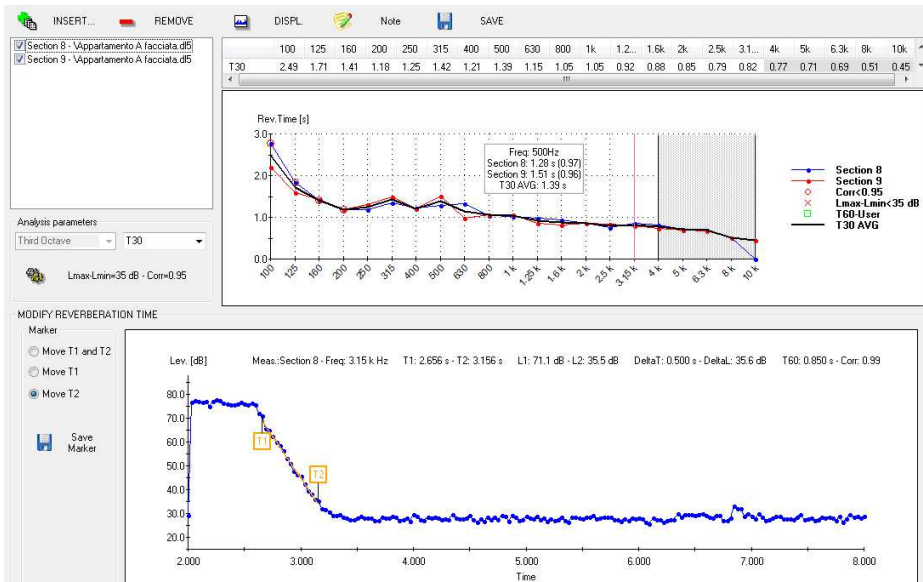
Luogo di misura: _____
 Caratteristiche della partizione: _____

Frequenza [Hz]	R [dB]	R' [dB]
50	0.0	0
63	0.0	0
80	0.0	0
100	43.3	33.0
125	36.6	36.0
160	40.0	39.0
200	44.7	42.0
250	44.8	45.0
315	43.7	48.0
400	44.8	51.0
500	45.5	52.0
630	49.1	53.0
800	51.2	54.0
1000	54.0	55.0
1250	56.8	56.0
1600	58.5	56.0
2000	61.5	56.0
2500	60.2	56.0
3150	61.8	56.0
4000	63.1	0
5000	67.5	0

$R'_w = 52.0$ dB

$C = -1$ $Ctr = -4$

$V_r = 50$ [m³]
 $S_r = 10.0$ [m²]



MEASUREMENT UNCERTAINTY: for each acoustic descriptor the s_m measurement uncertainty is calculated, as the standard deviation of reproducibility of assessment measures

Cat.UI (Dlgs 5/12/1997) A: residential buildings or us Type.UI (UNI11367) Residential use

UI Class	D2m,nT,w	R'w	L'n,w	Lic	Lid
NC	NC	4	1	NC	NC

REQUIREMENT	VALUE	Corr...	Threshold D.lgs 5/12/1997	Zr
Norm. Facade Insulation	27	None	40	NC
Apparent Sound Red. Index of partitions	46	None	50	4
Norm. Impact sound pressure level	45	None	63	1
Corr. discontin. systems noise level	57.4		35	10
Corr. cont. systems noise level	44.6		35	10

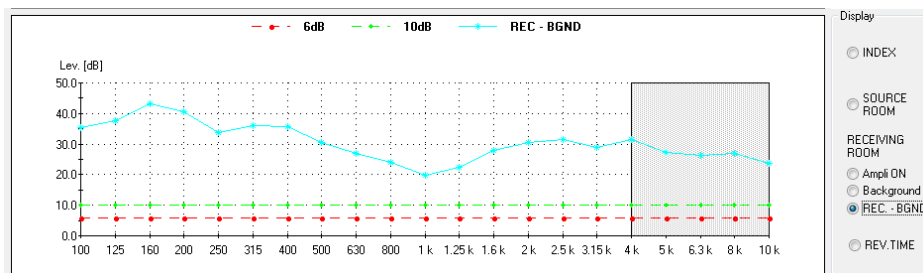
Cat.UI (Dlgs 5/12/1997) A: residential buildings or us Type.UI (UNI11367) Residential use

DESCRIPTOR	VALUE
Sound Reduction Hor.	46.0
Sound Reduction Vert.	46.0
APP. SOUND REDUC. INDEX OF PARTITIONS	46.0 - Class 4

Meas	Measured Value [dB]	Uncert. [dB]	Correct.	Useful value [dB]	Meas.
R1 - Isolamento sonoro	47 (-1;0)	1	None	46	Orizz.
R2 - Isolamento sonoro	47 (-1;0)	1	None	46	Vert.
R3 - Isolamento sonoro	47 (-1;0)	1	None	46	Horiz.

CLASSIFICATION OF BUILDING'S INSULATION PERFORMANCE

Noise Studio NS3 allows to classify building's acoustic performance according to **UNI 11367/10** technical standard. Sound insulation measurements are loaded in the project and associated with specific housing unit; once descriptors R'w, D,2m,nT,w, L'n,w, and continuous/discontinuous service equipments levels are calculated, classification is generated automatically including single descriptors values, specific descriptors class, and overall class of specific housing unit. A useful **graphic function** allows to **insert and modify bitmaps like floor plans**.



In order to verify that background noise doesn't influence the receiving room spectrum, it's possible a direct graphical comparison between background and received noise spectra. Obtained curve ($L_{Rec} - L_{Bgnd}$) is compared to 10dB and 6dB thresholds as suggested in ISO technical standards.

Editing T60

- ◆ Real time display of data processing
- ◆ T60 decay curve recalculation
- ◆ Correlation Index calculation
- ◆ Indication of User-T60 after processing
- ◆ Direct display of single and average spectra.
- ◆ Fast and easy selection of useful data for calculation using check-boxes.

Project management using a tree structure. Direct and fast access to relevant data by a simple mouse click.



Grouping of data in **housing units** for a simple and organic access. Possibility to add a name to each unit for a easy identification of measurements .

Word documents integration and images on each project. Editing of data already processed.

POST PROCESSING OF NOISE MEASUREMENTS

Noise Studio also integrates in the *building acoustic module* the possibility to post process time profile data by the insertion of multiple masks. In this way it's possible to eliminate from calculation unwanted events or calculate specific sources. Evaluation ad processing of **continuous and discontinuous service equipments noise**

Distributor

Languages: English, Italian

Software compatibility: Win98, 2000, Vista, XP, Win7 (32-64), Win8