



## **SOUND INSULATION TEST OF TABIHAUS PANELS**

# **BLUE NOISE**

17th August 2020 - BN\_20\_124\_rev0

## **1. Precedents and object.**

The aim is to determine the acoustic performance of materials in terms of their insulation against airborne noise.

For this purpose, samples are installed to divide a double test chamber, where there is a low transmission of noise by indirect flanks.

In addition to knowing the insulation of the materials, the aim is to obtain knowledge about what factors are influencing this insulation, in order to be able to implement improvements.

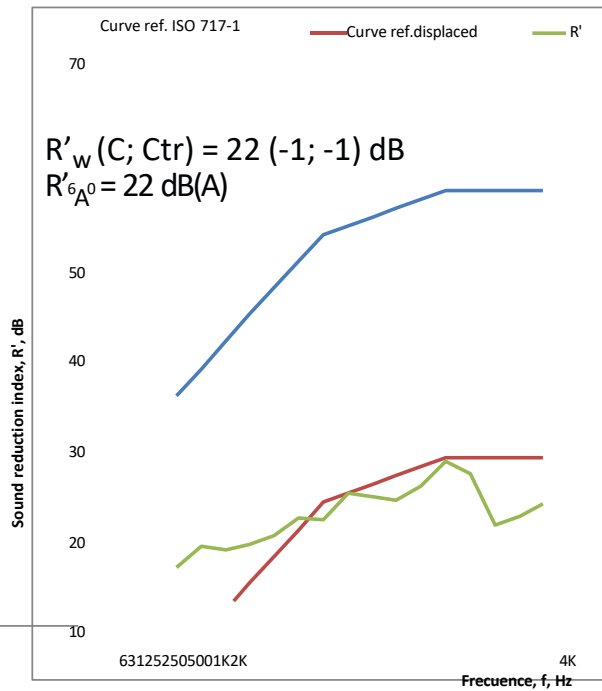
Three different samples of the product TABIHAUS from Andaragón S.L.U. are received for testing.

## 2. Airborne sound insulation tests.

Tests are carried out in accordance with the recommendations of the UNE EN-ISO 140-4 standard, with the following results.

### 2.1. TABIHAUS 62mm (7mm board + Polystyrene 48mm + 7mm board)

Frecuence f, (Hz)	R' (1/3-octave) (dB)
50	
63	
80	
100	13,8
125	16,2
160	15,8
200	16,3
250	17,4
315	19,3
400	19,1
500	22,2
630	21,7
800	21,2
1000	22,8
1250	25,6
1600	24,2
2000	18,6
2500	19,6
3150	20,8
4000	25,5
5000	26,7

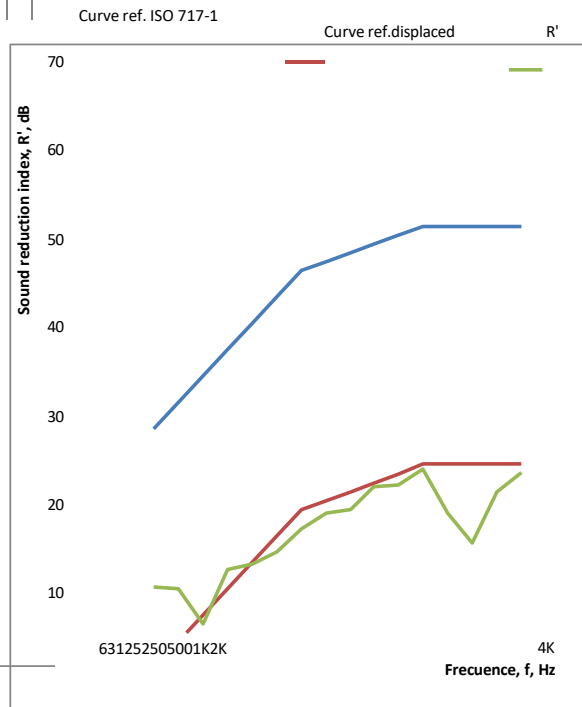


*The uncertainty of the overall result is within  $\pm 2$*

Observations:

## 22. TABIHAUS 65mm (Board 7mm + Heavy Rubber Sheet 3mm + Polystyrene 48mm + Board 7mm)

Frecuence f, (Hz)	R' (1/3-octave) (dB)
50	
63	
80	
100	15,2
125	15,0
160	11,1
200	17,2
250	17,7
315	19,1
400	21,8
500	23,6
630	24,0
800	26,5
1000	26,7
1250	28,5
1600	23,6
2000	20,2
2500	26,0
3150	28,1
4000	30,9
5000	34,5



$R'_{w}(C; Ctr) = 25 (-2; -3) \text{ dB}$

$R'_{A} = 24 \text{ dB(A)}$

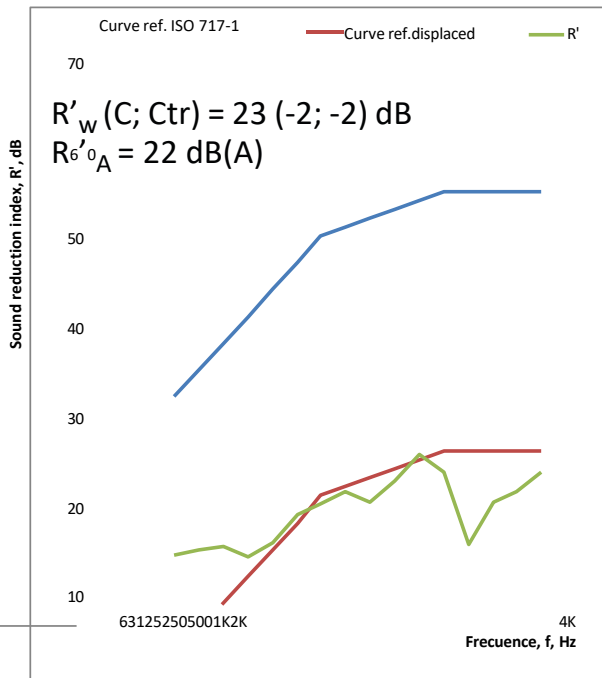
*The uncertainty of the overall result is within  $\pm 2$*

Observations:



### 2.3. TABIHAUS 92mm (Board 7mm + Polystyrene 78mm + Board 7mm)

Frequency f, (Hz)	R' (1/3-octave) (dB)
50	
63	
80	
100	15,4
125	16,0
160	16,3
200	15,2
250	16,8
315	19,9
400	21,0
500	22,5
630	21,3
800	23,6
1000	26,5
1250	24,5
1600	16,6
2000	21,2
2500	22,4
3150	24,7
4000	30,1
5000	32,4



*The uncertainty of the overall result is within ± 2*

Observations:

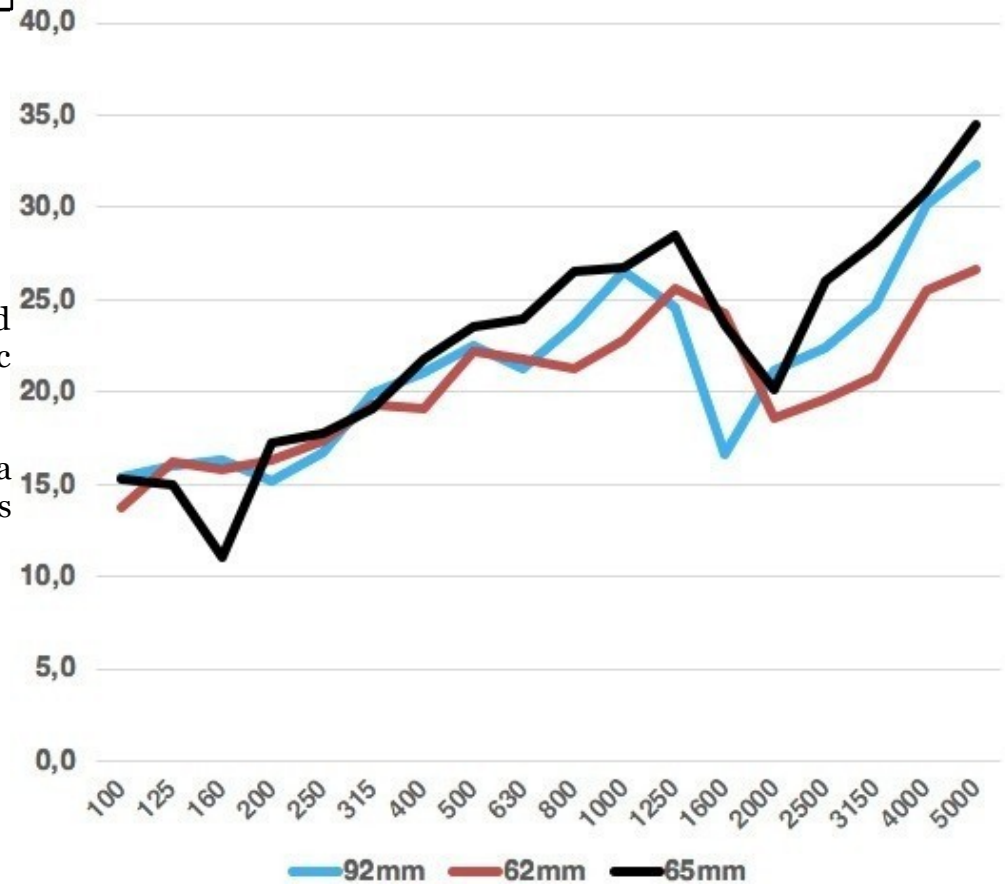
### 3. Summary of results and conclusions.

TABIHAUS	R'w (C; Ctr)	R'A
6 m	22 dB	22 dBA
65mm incorporates heavy rubber sheeting	25 dB	24 dBA
9 m	23 dB	22 dBA

The results obtained allow us to draw two important conclusions:

1. The fact of increasing the thickness of the polystyrene placed between plates, hardly represents an improvement to the acoustic insulation of the whole.
2. The incorporation of the heavy rubber sheet (3mm) does provide a notable increase in insulation (2-3 dB), with hardly any thickness consumption.

Here is a further explanation as to why this may be happening.

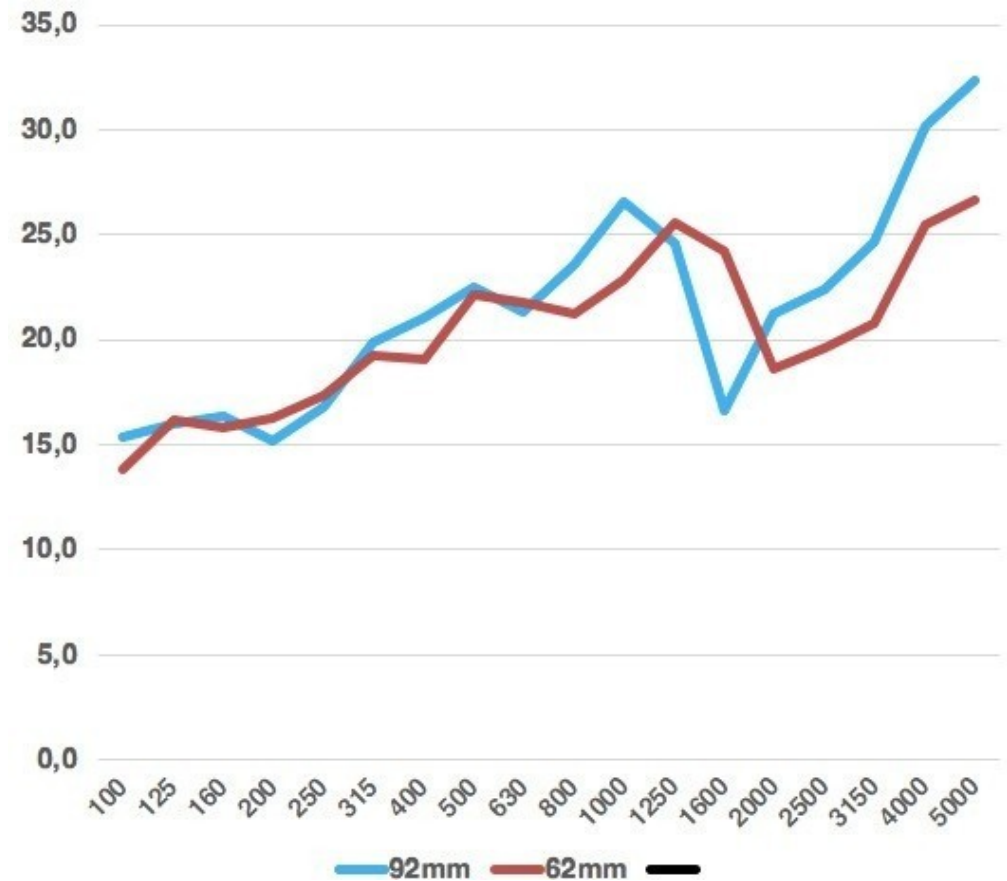


### Effect of increasing the thickness of polystyrene.

As we increase the thickness of the polystyrene layer, the insulation generally increases by thirds of octave bands.

However, the resonant frequency is shifted downwards (in our case from 2000 Hz to 1600 Hz), which leads to a decrease in the overall isolation.

In the end, what we make better on the one hand, we make worse on the other.



### Effect of the incorporation of heavy rubber sheeting.

The heavy rubber foil provides increased insulation in all third octave bands, although its effect is hardly noticeable where polystyrene has its resonant frequency (2000 Hz).

However, a new resonance frequency is incorporated, around 160 Hz, corresponding to the heavy rubber sheet.

The effect of the resonances (that of the heavy rubber and that of the polystyrene) means that the increase in insulation provided by the heavy rubber is not greater.

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