



VicBooth Ultra 1x1

Noise Reduction Measurements

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Executive Summary

Vicoustic has developed the new VicBooth Ultra. This modular sound insulation booth was designed to be used in several possible applications within the Pro Audio market (e.g. rehearsal, recording, mixing, etc.).

In July 2020, Vicoustic carried out a series of laboratory measurements within its Research & Development facilities, in the Reverberant Chamber, in order to characterize the VicBooth Ultra in terms of its sound insulation performance.

This report describes the methodology used and the results obtained during the tests. A comparison is made between the results obtained for different configurations of the VicBooth Ultra 1x1.

The VicBooth Ultra 1x1 was characterized in terms its Noise Reduction values, according to ASTM E596, and the Noise Insulation Class (NIC) was calculated, according to ASTM E413.

During the tests the following construction layout were analysed:

CL1 – VicBooth Ultra 1x1 with standard walls and standard door;

CL2 – VicBooth Ultra 1x1 with standard walls fitted with Cinema Round Premium and standard door.

The following results were obtained for the tested configurations:

CL1 – NIC = 30 dB

CL2 – NIC = 31 dB

It is possible to conclude that the NIC increased by 1 dB with the inclusion of Cinema Round Premium.

Additionally, when analysing the Noise Reduction vs. Frequency graph, it is possible to conclude that the noise reduction of the VicBooth Ultra 1x1 increased by several dB throughout the spectrum (from the 250 Hz one-third octave band to the 1250 Hz one-third octave band) with the inclusion of Cinema Round Premium within it (compared to the standard configuration). This increase throughout the tested frequency spectrum ranged from 1 dB to 5 dB in the several one-third octave bands.

It is possible to conclude that the inclusion of the Cinema Round Premium – an effective sound-absorbing panel – within the VicBooth Ultra leads to improved results in terms of the Noise Reduction and, consequently, the Noise Insulation Class (NIC). This improvement occurs, naturally, in the region where Cinema Round Premium has bigger sound absorption performance.

Additionally, from a qualitative analysis inside of the VicBooth Ultra, it was possible to notice audible improvements regarding the acoustic conditions within the booth, when Cinema Round Premium panels were placed inside: sound reproduced within the booth became clearer, leading to a better sound definition when recording within the booth with additional acoustic treatment. This can also be pertinent for speech applications and improvement of speech intelligibility.

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1. Introduction

Vicoustic has developed the new VicBooth Ultra. This modular sound insulation booth was designed to be used in several possible applications within the Pro Audio market (e.g. rehearsal, recording, mixing, etc.).

In July 2020, Vicoustic carried out a series of laboratory measurements within its Research & Development facilities, in the Reverberant Chamber, in order to characterize the VicBooth Ultra in terms of its sound insulation performance.

This report describes the methodology used and the results obtained during the tests. A comparison is made between the results obtained for different configurations of the VicBooth Ultra 1x1.

Acoustic terms, definitions and symbols used in this document are presented at the Glossary at the end of this report.

2. VicBooth Ultra Noise Reduction

2.1 Noise Reduction Values (NR values)

VicBooth Ultra's Noise Reduction values in one third octave bands (NR) have been characterized according to ASTM E596: Standard Test Method for Laboratory Measurement of Noise Reduction of Sound-Isolating Enclosures.

During the tests, Vicoustic has performed the following construction layout validations:

- CL1 - VicBooth Ultra 1x1 with standard walls and standard door;
- CL2 - VicBooth Ultra 1x1 with standard walls fitted with Cinema Round Premium and standard door.

Table 1 presents the values obtained for the different tested configurations.

f (Hz)	CL1 - NR (dB)	CL2 - NR (dB)
125	28	28
160	25	25
200	27	27
250	24	26
315	23	25
400	24	28
500	25	30
630	31	33
800	31	35
1000	32	35
1250	34	35
1600	32	32
2000	29	30
2500	28	28
3150	30	30
4000	34	34

Table 1 - VicBooth Ultra's tested configurations - Noise Reduction

Figure 1 presents the Noise Reduction (NR) in dB, obtained for the different Construction Layouts that were tested.

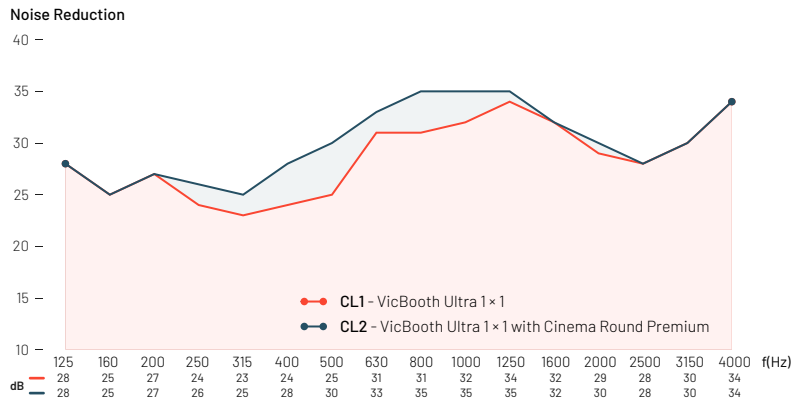


Figure 1 - VicBooth Ultra 1x1 - Noise Reduction (NR) for CL1 and CL2

Figure 2 shows the inside of the VicBooth Ultra 1x1 for the different tested Construction Layouts.



Figure 2 - VicBooth Ultra 1x1 - Left: without Cinema Round Premium inside (CL1);
Right: with Cinema Round Premium inside (CL2).

2.2 Noise Isolation Class (NIC)

Based on the NR values stated on Table 1, the NIC for the different VicBooth Ultra 1x1 Construction Layouts tested was calculated according to ASTM E413 – Classification for Rating Sound Insulation.

NIC is a single number rating that is correlated in a general way with subjective impressions of sound transmission for speech, radio, television and similar sources of noise in offices and buildings.

Table 2 presents the NIC for the different VicBooth Ultra 1x1 Construction Layouts that were tested, in dB.

f (Hz)	NIC (dB)
CL1	30
CL2	31

Table 2 - VicBooth Ultra 1x1
- Noise Isolation Class

Figure 3 and Figure 4 present the Noise Reduction (NR) and associated ASTM E413 ref. curve in dB, obtained for the different Construction Layouts that were tested.

Figure 3 - VicBooth Ultra 1x1 - Noise Reduction and associated ref. curve for CL1

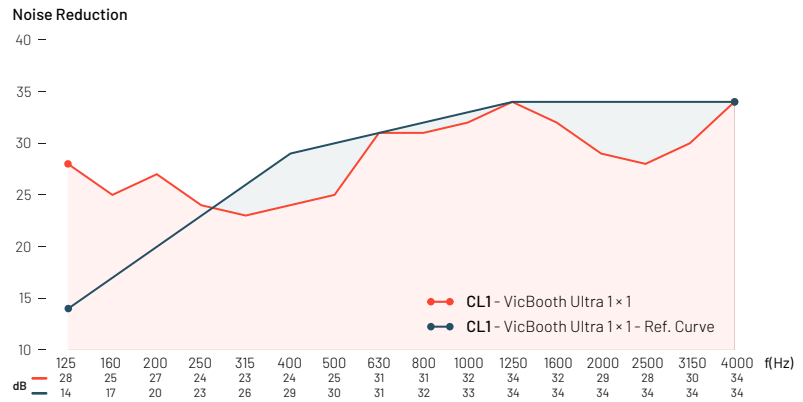
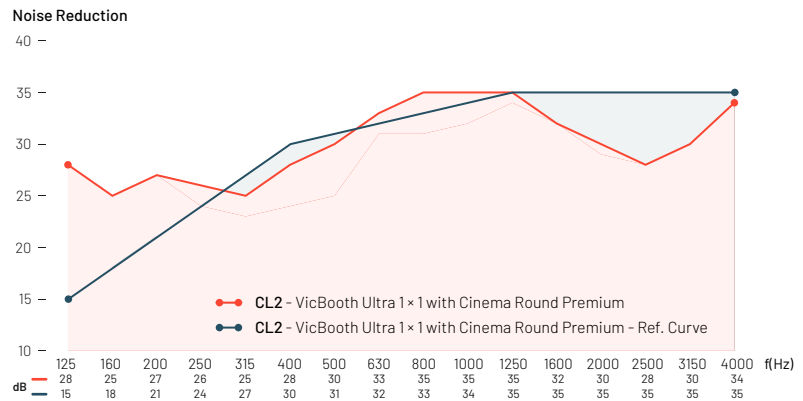


Figure 4 - VicBooth Ultra 1x1 - Noise Reduction and associated ref. curve for CL2.



3. Conclusions

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Glossary

NR (dB) – Noise Reduction Values in one-third Octave Bands – difference between space averaged sound pressure level measured outside the enclosure (in the reverberant room) and the space averaged sound pressure level measured inside the enclosure.

NIC (dB) – Noise Isolation Class, it is the single-number rating given by the value of the Shift Ref. Sound Insulation Contour at 500 Hz and using the methodology stated on ASTM E413.

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