

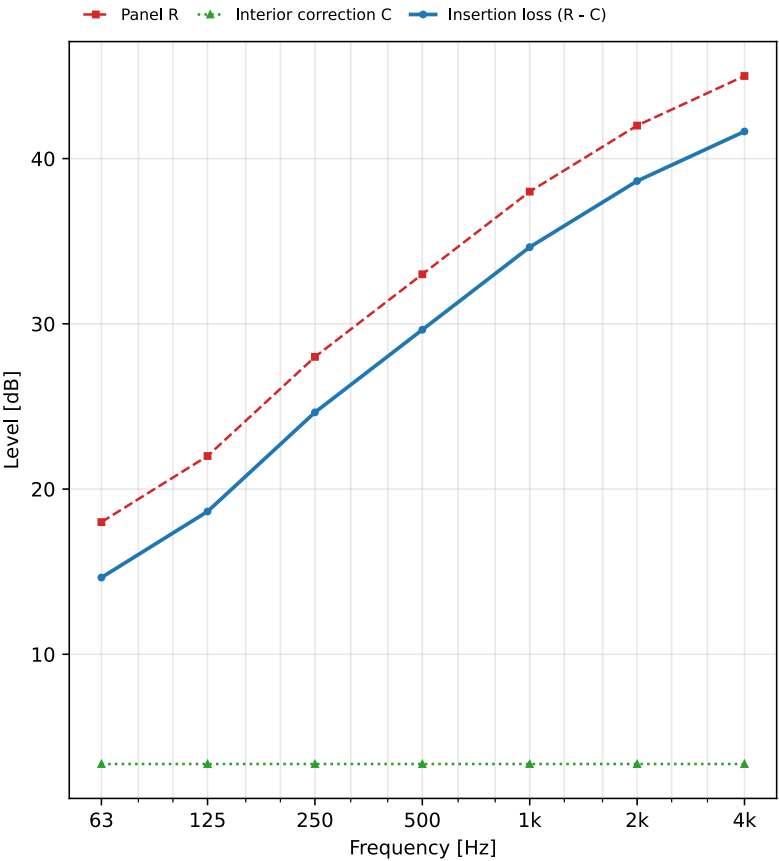
Machine enclosure insertion loss

Determination of the insertion loss of a machine enclosure from the panel transmission loss and the interior build-up correction (Bies, Hansen & Howard, Engineering Noise Control 5th ed., section 7.4.2, Eqs. (7.103) and (7.111)).

Client:	Example client	Noise source:	Sheet-steel close-fitting machine enclosure
Test environment:	Machine hall, line 3 (example)	Instrumentation:	Class 1 SLM (IEC 61672-1), octave bank
Temperature [°C]:	21	Relative humidity [%]:	45
Ambient pressure [kPa]:	101.2	Date of test:	2026-07-22

Octave-band insertion loss

f [Hz]	R [dB]	C [dB]	IL [dB]
63	18.0	3.4	14.6
125	22.0	3.4	18.6
250	28.0	3.4	24.6
500	33.0	3.4	29.6
1000	38.0	3.4	34.6
2000	42.0	3.4	38.6
4000	45.0	3.4	41.6



Mean insertion loss IL = 28.9 dB

Mean panel transmission loss R = 32.3 dB
External surface area $S_E = 24.00 \text{ m}^2$
Internal surface area $S_i = 30.00 \text{ m}^2$

Result vs requirement: IL = 28.9 dB, required $\geq 20.0 \text{ dB}$ → **PASS**

IL = R - C with the interior build-up correction $C = 10 \lg(0.3 + S_E / R_i)$ and the interior room constant $R_i = S_i \alpha_i / (1 - \alpha_i)$ (Eqs. (7.103) and (7.111)). The panel transmission loss R is supplied by the caller (measured or predicted); this evaluation combines it with the interior build-up correction only.

Laboratory: Phonometry reference example

Report no.: EXAMPLE-ENCLOSURE

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Operator: phonometry Signature: _____

■ The results relate only to the tested specimen.
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