

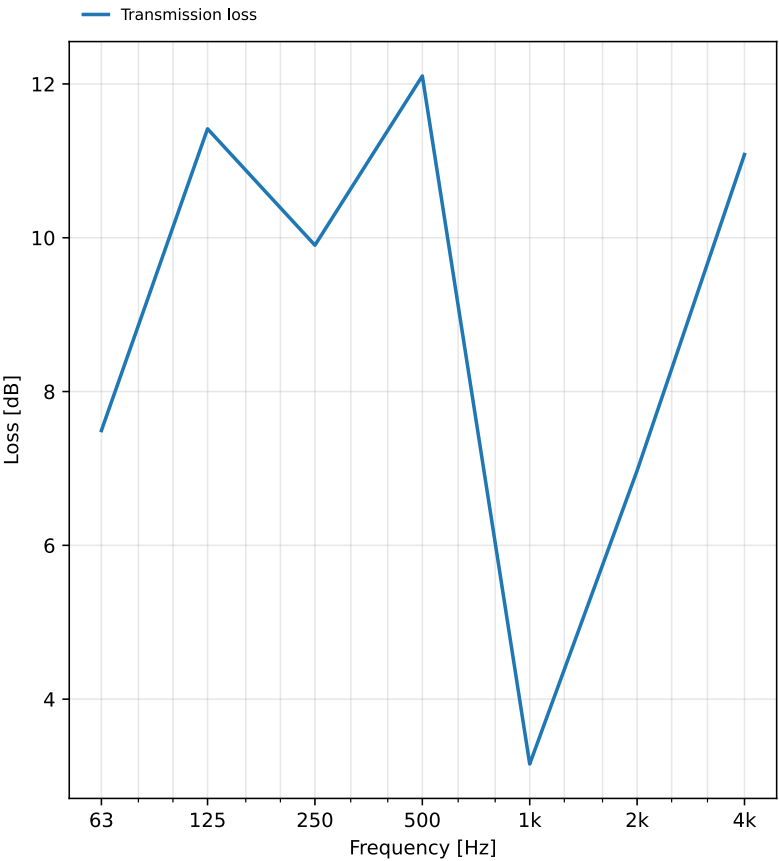
Reactive silencer transmission loss

Determination of the transmission loss of a reactive silencer by the plane-wave four-pole (transfer-matrix) method (Munjal, Acoustics of Ducts and Mufflers 2nd ed., Eq. (3.27); Bies, Hansen & Howard, Engineering Noise Control 5th ed., sections 8.8 to 8.9).

Client:	Example client	Noise source:	Simple expansion-chamber muffler (m = 8)
Test environment:	Duct acoustics rig (example)	Instrumentation:	Two-microphone transfer-matrix bench
Temperature [°C]:	20	Ambient pressure [kPa]:	101.3
Date of test:	2026-07-22		

Octave-band transmission loss

f [Hz]	TL [dB]
63	7.5
125	11.4
250	9.9
500	12.1
1000	3.2
2000	7.0
4000	11.1



Mean transmission loss TL = 8.9 dB

Peak transmission loss = 12.1 dB
Device: expansion chamber

Result vs requirement: TL = 8.9 dB, required ≥ 6.0 dB → **PASS**

$TL = 10 \lg[(Z_n/Z_1) (1/4) |T_{11} + T_{12}/Z_n + Z_1 T_{21} + (Z_1/Z_n) T_{22}|^2]$ from the compound four-pole matrix T, with the characteristic impedances $Z_1 = \rho c/S_{in}$ and $Z_n = \rho c/S_{out}$ (Munjal Eq. (3.27), no flow). TL is the intrinsic attenuation for an anechoic termination; the insertion loss adds the source and radiation impedance mismatch.

Laboratory: Phonometry reference example

Report no.: EXAMPLE-SILENCER

Date: 2026-07-22

Operator: phonometry Signature: _____

■ The results relate only to the tested specimen.
Generated by phonometry.