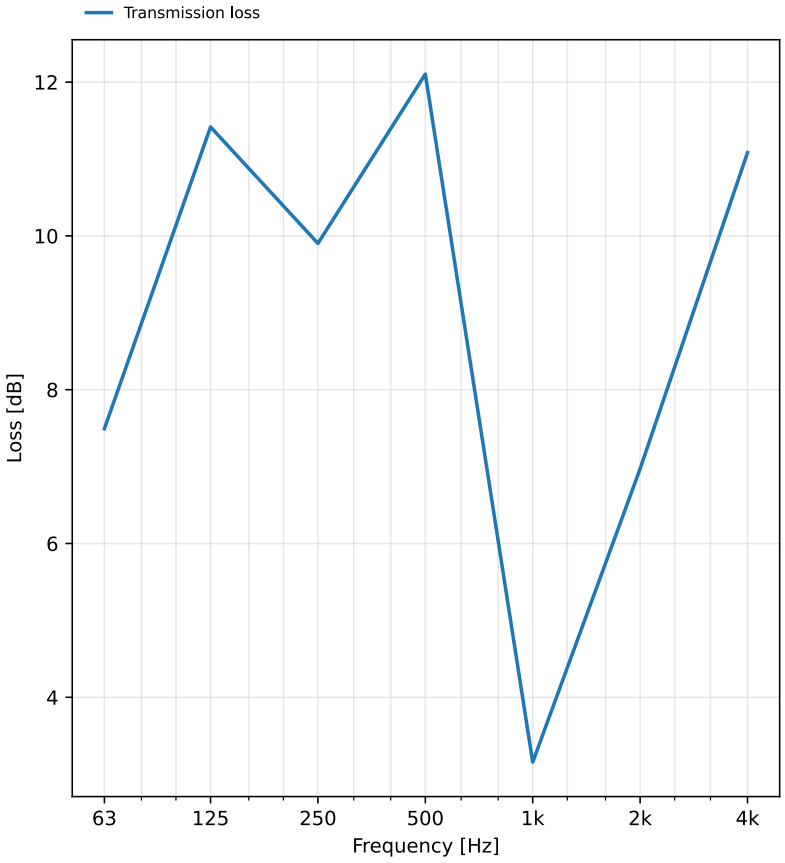
Reactive silencer transmission loss

Predicted transmission loss of a reactive silencer, computed 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). This is a prediction from design data, not a measurement.

Client:	Example client	Noise source:	Simple expansion-chamber muffler (m = 8, design case)
Test environment:	Duct system design study	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

Predicted (estimated) result computed from the declared silencer geometry by the plane-wave model without flow; it is not a measurement. Above the plane-wave cut-on frequency of the duct, and with mean flow or dissipative lining present, the realised performance departs from this model.

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

TL = 10 lg[(Zn/Z1) (1/4) |T11 + T12/Zn + Z1 T21 + (Z1/Zn) T22|2] from the compound four-pole matrix T, with the characteristic impedances Z1 = ρc/Sin and Zn = ρc/Sout (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 are a prediction computed from the stated inputs; they are not a measurement of a specimen.