Duct-borne noise path calculation

Octave-band sound level in an occupied space from an air distribution system, estimated element by element along the duct path (AHRI Standard 885; Long, Architectural Acoustics 2nd ed., Chapters 13-14). Room criterion per ANSI/ASA S12.2-2019. This is a prediction from design data, not a measurement.

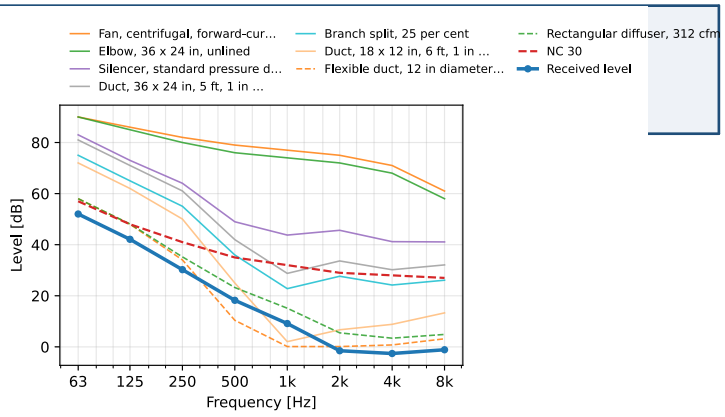
Client:	Example client	Noise source:	Supply air path, roof-mounted built-up air handler (design case)
Test environment:	Open-plan office, 6.1 x 6.1 x 2.4 m, carpeted (design case)	Date of test:	2026-07-29

Octave-band path calculation, dB

Ref.	Element	63	125	250	500	1k	2k	4k	8k
S	Fan, centrifugal, forward-curved, 5000 cfm, 2…	90	86	82	79	77	75	71	61
2	Elbow, 36 x 24 in, unlined	0	–1	–2	–3	–3	–3	–3	–3
	Self-noise	41	39	36	29	20	6	0	0
3	Silencer, standard pressure drop, 3 ft	–7	–12	–16	–28	–35	–35	–28	–17
	Self-noise	49	43	44	42	42	45	35	24
4	Duct, 36 x 24 in, 5 ft, 1 in lining	–2	–2	–3	–7	–15	–12	–11	–9
5	Branch split, 25 per cent	–6	–6	–6	–6	–6	–6	–6	–6
6	Duct, 18 x 12 in, 6 ft, 1 in lining	–3	–3	–5	–11	–25	–22	–16	–13
7	Flexible duct, 12 in diameter, 6 ft	–14	–14	–16	–15	–17	–22	–16	–13
8	Rectangular diffuser, 312 cfm	0	0	0	0	0	0	0	0
	Self-noise	33	32	29	23	15	4	0	0
R	Room effect	–6	–6	–5	–5	–6	–7	–6	–6
Lp	**Received level**	**52**	**42**	**30**	**18**	**9**	**–2**	**–3**	**–1**
NC	**NC 30**	**57**	**48**	**41**	**35**	**32**	**29**	**28**	**27**

Room criterion **NC-22.6 (125 Hz)**

Result vs requirement: no band exceeds NC 30; smallest margin 5 dB at 63 Hz → **PASS**



Predicted (estimated) result computed from the declared duct geometry, element data and room condition; it is not a measurement. A real installation also depends on the balancing of the system, on breakout along the run and on flanking paths the sheet does not carry.

Attenuations are printed as negative level changes and summed band by band; a regenerated (self) noise row is a sound power level and is combined with the running level on an energy basis. The room effect converts the sound power reaching the terminal device into a sound pressure level in the room.

The verdict compares the received octave-band levels with the NC 30 curve of ANSI/ASA S12.2-2019 band by band; the boxed designation is the standard's own rating of the received spectrum.

Laboratory: Phonometry reference example
Report no.: EXAMPLE-DUCT-PATH
Date: 2026-07-29
Operator: phonometry Signature: _____

■ The results are a prediction computed from the stated inputs; they are not a measurement of a specimen.