DISCOM
industrial noise control

ACOUSTICS CALCULATIONS

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To answer the question whether a silencer satisfies for a particular application it is not sufficient to calculate with the average attenuation figure attached to the silencer. It is very important to know something about the noise spectrum of the source, in this case the exhaust noise.

Depending on the spectrum of the unsilenced source the figure after attenuation may vary dramatically, as illustrated by the following example.

EXAMPLE

* spec. = spectrum
** res. = resultaat

frequency (in Hz)	spec. 1 (dB)*	spec. 2 (dB)	spec. 3 demping HM (dB)	spec. 4 res. 1 (dB)**	spec. 5 res. 2 (dB)
63	109	120	7.7	101.3	112.3
125	107	118	16.7	90.3	101.3
250	105	117	24.1	80.9	92.9
500	110	109	44.0	66.0	65.0
1000	113	105	47.0	66.0	58.0
2000	112	106	49.1	63.0	57.0
4000	108	104	49.4	58.6	54.6
8000	105	93	34.0	71.0	59.0
A	117 dB(A)	114 dB(A)		80.0 dB(A)	90.0 dB(A)

Spectrum 1 represents the unsilenced exhaust noise of an engine with a high frequency character, for example a turbo-charged engine, while spectrum 2 represents the unsilenced exhaust noise of an engine with a low frequency character.

For both engines the same exhaust silencer is used, suppose the HM, with the attenuation given in column 4. A significant difference is observed between the average of the remainder between the two engines, see column 5 and 6.

We possess an advanced computer program in which most engine data is stored, so herewith we can calculate quick and adequately the silencer(s) for your application.

TEST PROCEDURE

All the attenuation data mentioned in this catalogue is based on practical measurements, carried out by an independent institute. The tested silencers were designed for a 6" NB system. Measurements were taken under full-load conditions of test engine, with a B&K real time analyzer, type 2143, with microphone 4155, measurement time was 60 seconds. The microphone was positioned at a distance of 1 meter with an angle of 45° from exhaust orifice. The influence of "flow noise" is included in the results, therefore it provides you with realistic data.

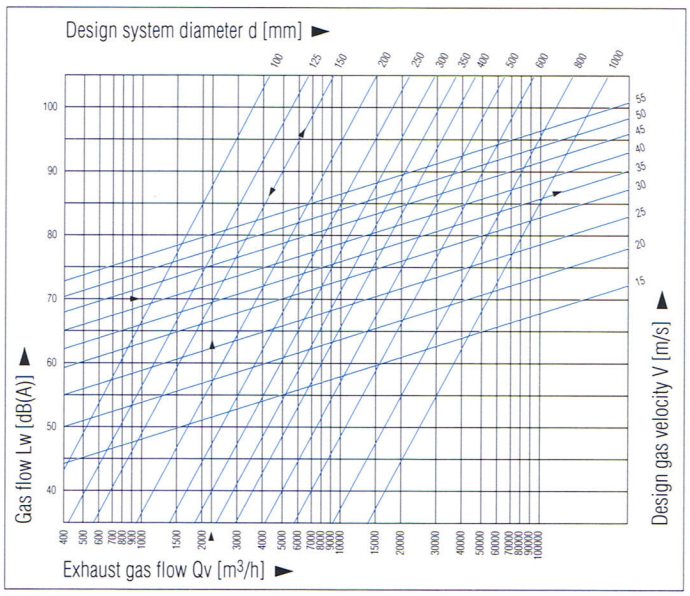
GAS FLOW NOISE

Choosing the right gas velocity is of great importance for the resulting noise levels. Depending upon the required noise level, it can be necessary to reduce the design gas velocity because it is this velocity especially if the gas flow noise is greater than your engine/silencer combined.

Example

Required end results	Lw = 70 dB(A)
Exhaust gas flow	Qv = 2200 m^3/h
Design gas velocity from graph	V = max. 35 m/s
System diameter from graph	d = 150 mm (6")

GAS FLOW NOISE IN EXHAUST PIPE WORK



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