

VIBRO-ACOUSTICS APPLICATION PHILOSOPHY

Applied Engineering for proper noise control design

VIBRO-ACOUSTICS is dedicated to helping make the world a quieter place, working with consultants to identify and/or engineer the best noise control solution specific to their project. Most importantly, through analysis, we determine where the solution should be applied so that it works as designed, during system operation. To ensure that a project is not at risk for noise and/or pressure drop issues, we provide a Lay-In Service. At the design stage, our application engineering team considers both noise and aerodynamics when applying noise control solutions. Our Lay-In Service uses applied engineering to consider key project requirements such as Indoor Air Quality, energy efficiency, minimal costs, and space restraints when identifying the best solution and location. We engineer the solution to be pragmatic so that contractors can minimize their installation costs and their risk of noise problems.

THE LAY-IN 1-2-3 PROCESS



1

Noise Risk Assessment

We will review and perform a complete HVAC system analysis of the acoustics and aerodynamics of the project and determine the level of risk for noise problems.

Deliverable: A report that shows the results of the acoustical system analysis and if needed, how much noise control is required to meet sound level criteria.



2

Engineer the Best Solution

Based on system needs, we select and engineer the best solution that meets project requirements.

Deliverable: A project-specific, optimized solution, complete with a schedule, specification and 3D renderings. We detail the acoustic performance, installed pressure drop at system design velocity, and special construction requirements.



3

Ensure Proper Application

We specify where the solution should be located by laying in the solution onto your drawings.

Deliverable: Marked-up project drawings illustrating noise control product locations.

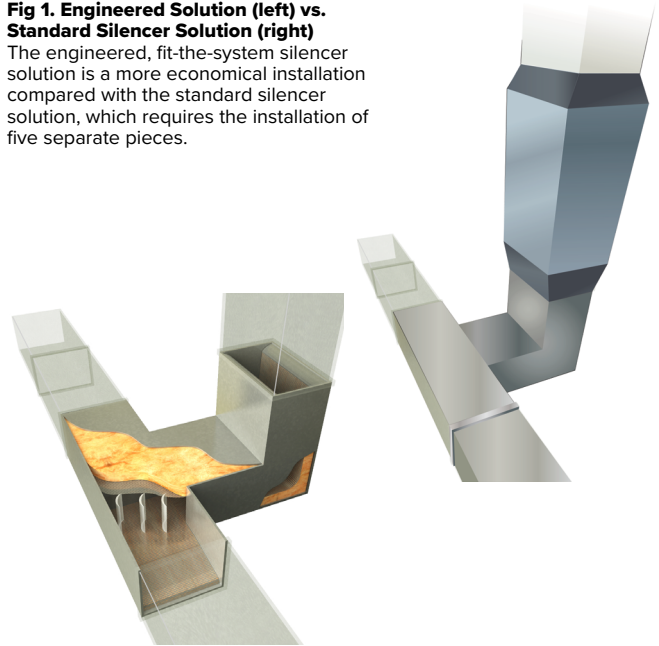
**SILENCERS
DO NOT NEED TO
ADD TOO MUCH
PRESSURE DROP**

**Significantly lower operating costs
when silencing HVAC systems**

THERE IS A MISCONCEPTION in the industry that silencers add too much pressure drop and therefore significantly increase energy consumption of an HVAC system. However, this is only true when silencers are selected incorrectly and/or misapplied. The difference in pressure drop between an applied solution and a misapplied silencer is often three times (e.g. 0.21” vs. 0.63”) and can be as much as ten times (e.g. 0.1” vs. 1.0”).

Upon request, we can offer an Operating Cost Report to show the savings and payback of using an applied solution over a standard product.

Fig 1. Engineered Solution (left) vs. Standard Silencer Solution (right)
The engineered, fit-the-system silencer solution is a more economical installation compared with the standard silencer solution, which requires the installation of five separate pieces.



<p>Case Example: An NYC Hospital</p> <p>With 12 × 22,450 CFM fan systems, the difference between an added 0.68” for standard silencers and 0.36” for fit-the-system silencers means</p> <p>\$867,636 in savings over a 20 year life of the HVAC system.</p>	ENERGY CALCULATIONS	Static Pressure with System Effect (in. WG)	0.68	0.36	0.32	
		Air horsepower (AHP)	2.40	1.27	1.13	
		Brake horsepower (BHP)	3.20	1.70	1.51	
		Electrical horsepower (EHP)	3.56	1.88	1.67	
		Annual operating cost	\$3,951	\$2,092	\$1,859	
		20 year operating cost	\$153,644	\$81,341	\$72,303	
		20 year operating cost (12 systems)	\$1,843,727	\$976,091	\$867,636	
		PAYBACK TIME ON FIRST COST	Catalog selection first cost (one system)	\$4,350		
			Additional material cost (e.g. transitions or other fittings)	\$1,800		
			Additional labor cost (to install catalog selection)	\$800		
Total catalog selection first cost	\$6,950					
Engineered system first cost (one system)	\$7,560					

> Ask us, your local Vibro-Acoustics Representative, to provide an engineered noise control solution with an operating cost report to help you design savings into your next project.

MYTH: VIBRO-ACOUSTICS IS AN ACOUSTICAL CONSULTANT

We collaborate, not compete, with Acoustical Consultants.

THE SCOPE OF OUR APPLIED ENGINEERING APPROACH is limited to the proper selection and application of our noise control products to meet various project criteria. We help to bridge the gaps among design team members where products must achieve acoustical, structural, mechanical, and architectural objectives simultaneously. We often refer customers to acoustical consultants when a request falls outside our scope, and maintain mutually beneficial relationships and readily available contact lists on our website to help stay in touch and promote qualified consultants.

Here is a partial list of services typically available through acoustical consultant firms.

- > Specific to HVAC noise & vibration control:
 - > Equipment noise reduction – selection of quieter HVAC products
 - > Relocation of HVAC equipment – distancing the noise source from the receiver location
 - > System design – Consulting on system design to avoid noise problems
 - > Recommending criteria – advising on correct criteria methods and desired design conditions for different applications
 - > Testing, evaluation, and qualification of in-room criteria and environmental levels
- > Consulting, testing, and design in Room Acoustics
- > Environmental noise assessment, measurement, and mitigation
- > Architectural Acoustics including acoustic separation and interior acoustic design / consulting
- > Vibration analysis – Various types including: Building Vibration, Equipment Vibration, Sensitive Instruments (ex. MRI), and Environmental Vibration
- > Acoustic Modeling & Simulation
- > Structural Dynamics: analysis and design
- > Audiovisual/Multimedia



We encourage you to continue to promote the value of the Vibro-Acoustics Lay-in service and look for opportunities to partner with Acoustical Consultants on your next project.