Evolution of the Kinetics’ Silencer Database, Silencer Selection and Duct System Acoustics Analysis Software

(More than just another silencer manufacturer)

Since the inception of the Kinetics Noise Control Company (KNC) in 1958, our Team has striven to be at the forefront of innovative and effective noise control products and solutions. In 1996 KNC purchased Vibron, Ltd. (also established in 1958) a component bringing with it the expertise in the design and manufacture of standard and custom silencers (i.e., duct silencers, fan silencers, general ventilation silencers, test cell silencers, tuned mass dampers, gas and power turbine silencers, jet engine test cell silencers, etc.). Our noise control efforts are focused on the commercial, light industrial and heavy industrial markets. We focus worldwide and have the depth of knowledge and experience to rise above just being another silencer manufacturer.

The Kinetics Noise Control Company consists of a legacy of strong engineering skills and an inherent understanding of the vital role of technology in future processes. Continuously improving our technology gives us a strategic advantage and ensures our success and longevity. Through continued self-analysis we challenge ourselves to improve our products and processes as we move forward.

Our silencer designs were originally developed by Dr. Donald Allen, PhD, PEng, one of Vibron Product Group’s founders and a well-known expert on noise control. Under Dr. Allen’s direction, several of our notable PhD’s, were commissioned in-house to analyze our silencer performance and designs. They were tasked with creating the complex programs which would ultimately assist us in achieving highly accurate silencer performance prediction models; eventually automating many repetitive engineering processes. This has proved a key to our successful solutions to one-of-a-kind noise problems.

We designed and built a state of the art anechoic termination testing facility to assist us in perfecting designs and accurately establishing performance benchmarks. In doing so, they developed our one-of-a-kind, proprietary acoustical finite element numerical analysis program. This still forms the basis of all silencer performance data (pressure drop and insertion loss). The data was then tabled into a working matrix incorporated into an entirely new software program. This modeling software was then corrected with further in-house testing. Independent testing was then conducted at the Intertek (NVLAP Accredited) testing facility in Cortland, New York to verify our data. The program was then recalibrated and refinements made. All fine tuning backed by independent NVLAP accredited laboratory, field testing of installed silencers and acoustical analysis.

Under KNC’s direction, consultants were commissioned to create proprietary programs for producing automated cutting lists for fabrication. Again, the manual and repetitive tasks were recognized as a growing burden to the company. Due to the complexities of the program, this took several years and several versions to finalize.

Although we now had working versions of the silencer selection software, including a costing component, the cutting list software continued to be a completely separate program. These initial programs were intended for use by internal sales and engineering personnel, but KNC understood the need to equip our outside sales network with similar tools. We then decided to apply the silencer selection, with modified pricing capability, to outside sales representatives as well as acoustical consultants.

KNC engineers actively involved in the American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE) Technical Committee for Sound and Vibration (TC 2.6) and have written several articles for ASHRAE publications, as well as involvement in the ASTM.
committee E477, Testing of Duct Silencers and regarded as experts on silencers in North America have contributed to all facets of the program used today, from selection right through to testing. Our engineers were instrumental in bringing this program to the next level, which was then developed in Microsoft Windows Access database program and distributed via email or disk. This program was primarily a sales tool designed for easy silencer selection and had limited applications. It included features to provide automated submittals and was capable of generating bid documents within the program. Several versions of this program were released as updated information became available.

In analysis of the program’s future direction, KNC determined that due to frequent updates and improvements the existing platform was impractical. It was reasoned that a web-based program, which could be updated anytime (i.e. real-time, 24/7) was a much more efficient platform.

About the same time, KNC had developed an in-house order tracking system for improving our engineering and production planning schedules, as well as enhancing our level of customer service. This program was created as a project information management tool to provide management through the reporting of schedules, human resources and budgets, as well as features unique to Vibron Products Group processes. It was designed originally for use on the company network, but our team quickly recognized that transferring this application to the web and making this available to all of our customers would allow for streamlining the process. KNC’s programmers pooled their vast experience and knowledge to these tasks. Our teams’ engineering design experience, as well as the ability to translate these elements into programming has given these programs their depth and intelligence.

But silencer selection itself was only part of the tool required by acoustical consultants and design engineers. As a leader in the noise control industry, the KNC Team recognized that we required an engineering tool to evaluate noise control in heating, ventilating and air conditioning (HVAC) systems during the design phase. In other words, we needed to provide an HVAC duct acoustic analysis module to make the program whole. For years duct analysis was done manually. Over time many different programs were written and adapted in-house to assist in these calculations. Spreadsheets and data were developed and revised.

Once the decision had been made to create the HVAC duct analysis module of the program, we purchased and evaluated several duct analysis programs; from manufacturers as well as independent consultants. Our Team of PhD’s, engineers and programmers then extracted the best from all that we had learned and created KNC’s version of a design program. It was and continues to be based on the most recent and recognized ASHRAE algorithms including the ASHRAE (2003) updated plenum calculations. It is also immediately updated whenever ASHRAE issues changes or updates to any of its currently and newly developed algorithms.

With the implementation of our web-based system, we are able to integrate HVAC duct analysis with silencer selection; produce relevant bid documentation (schedules, specifications and submittal forms); generate purchase orders and automated fabrication documents. These fabrication documents contain highly-accurate cutting lists for silencer fabrication and complete parts drawings. They are developed in accordance with SMACNA (Sheet Metal and Air Conditioning Contractors National Association) Duct Construction Standards. The design and selection modules include KNC’s entire silencer database. We do not have 5 or 10 models of silencers but 100’s of silencer models, (i.e., round, rectangular, straight and elbows, transitional silencers, extended body silencers, media and “no-media” silencers, EnviroGREEN™ Mold Stop media, etc.), as well as 6 models of fixed-blade, acoustic louvers. Kinetics Noise Control, web-based, silencer selection, design analysis and duct silencer database is the result of literally tens of thousands of hours of research and programming. It represents our almost 50 years of experience and technical expertise. It is not the culmination of our efforts, but rather the base from which we chart our future. We have taken an effort to make the program as open and friendly to deal with as our company itself. We hope that this is the tool that will assist you in building a solid business and partnership with Kinetics Noise Control, Inc.

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