

# KINETICS NOISE CONTROL, INC. – MANUFACTURER OF NOISE CONTROL AND VIBRATION ISOLATION PRODUCTS

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## Résumé

Fournir d'importante réduction de bruit pour les équipements de CVC extérieurs peut être difficile. Des méthodes simples pour le traitement, tels que des enveloppe acoustiques conçus de parois de masse peuvent fournir une certaine réduction du bruit, mais souvent n'apporter la réduction pression acoustique à des niveaux acceptables. Afin de fournir des niveaux de réduction de bruit important des enceintes acoustiques conçues sur mesure peuvent être mises en œuvre.

**Mots-clés:** contrôle du bruit, bruit ambiant, enceinte acoustique, persiennes acoustiques, silencieux

## Abstract

Providing significant noise abatement for outdoor HVAC equipment can be challenging. Simple methods for treatment, such as mass-loaded acoustical wraps can provide some noise abatement, but often cannot bring the environmental sound pressure down to acceptable levels. To provide significant levels of noise abatement, custom acoustic enclosures can be designed and implemented.

**Keywords:** Noise control, environmental noise, acoustical enclosure, acoustical louver, silencer.

## 1 Introduction

Kinetics Noise Control, Inc. (Kinetics) has extensive experience in designing and manufacturing innovative products to control noise and vibration. Established in 1958 Kinetics continues to be an industry leader in eliminating unwanted noise and vibration.

Kinetics' manufacturing plant in Cambridge, Ontario, houses 60,000sqft of manufacturing space, and produces a wide range of noise control products for the light commercial to heavy industrial markets. Alongside with domestic manufacturing, the Cambridge office also offers custom engineered noise control solutions. These custom treatments can be engineered from standard components to keep cost at a minimum, or can be fully customized to offer maximum performance for the given restraints.

## 2 Product Line

The Cambridge manufacturing facility fabricates Kinetics' family of sheet metal products. The main noise control product produced is the silencer. The silencer attenuates noise along an airflow path via absorption of the sound wave, and comes in standard rectangular, circular or elbow configurations – or in virtually any other non-standard shape or arrangement (Figure 1).

Kinetics also offers acoustic louvers that are capable of providing noise reduction across a short length, and are suitable for building envelope applications (Figure 2).

The Kinetics NoiseBlock™ acoustic panel is a versatile product that can be adapted to form any shape of acoustic plenum, enclosure or barrier wall (Figure 3).

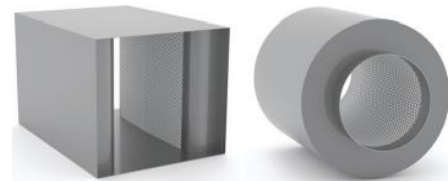


Figure 1: Kinetics Rectangular and Circular Silencer



Figure 2: Kinetics Acoustic Louvers

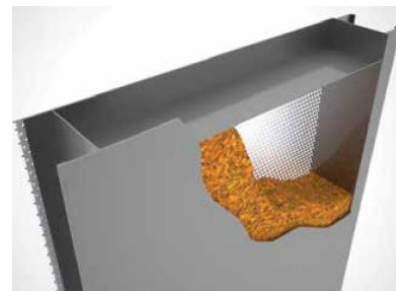


Figure 3: NoiseBlock™ Acoustic Panel

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With these three core noise control products a variety of custom solutions can be engineered to meet nearly any need.

### 3 Sample Project – Outdoor Air-Cooled Chiller

An outdoor air-cooled chiller was determined to be an environmental noise source. Within the chiller, the screw compressor generated middle and high frequency noise, and the up-blast fans generated low frequency noise. This produced a noise reduction need across the low to middle/high spectrum. The baseline sound pressure level of the installed chiller was measured to be 88 dBA at 10'. To mitigate this noise source a custom NoiseBlock™ enclosure was designed and engineered.



Figure 4: KNC Air-Cooled Chiller Enclosure

#### 3.1 Design Aspects

Care must be taken when enclosing a piece of mechanical equipment. For the air-cooled chiller, a critical design aspect of the treatment was the aerodynamic condition placed on the unit. The air-cooled chiller required specific fresh air volumes, without a significant pressure drop increase across the up-blast fans. Also, maintenance access and structural loading had to be considered.

#### 3.2 Treatment

The acoustic enclosure utilized three standard noise control products to create a fully customized solution. The majority of the enclosure comprised of NoiseBlock™ acoustic panels to provide the bulk of the absorption and transmission loss. To allow intake air flow, acoustic louvers were placed on the sides of the enclosure. These louvers allowed air to enter the enclosure, while still providing attenuation through the air passage. For the exhaust path, the enclosure had an open top with acoustic pergola baffles providing attenuation through the opening.



Figure 5: Interior of Enclosure and Pergola Baffles

#### 3.3 Results

Before installation of the acoustic enclosure, the sound pressure level of the unit was measured to be 88 dBA, at a 10' distance.

After installation, the sound pressure level was measured to be 69 dBA, at a 10' distance.

The sound pressure spectrum on the pre and post-installation conditions can be seen in Figure 6.

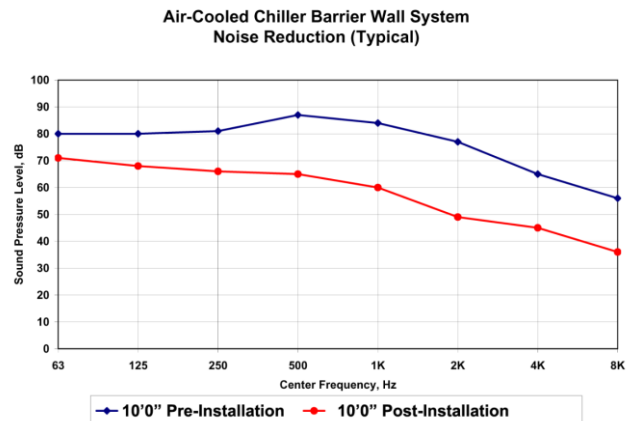


Figure 6: Sound pressure level measurement

The acoustic enclosure provided an overall noise reduction of 19 dBA, with an added pressure drop of only 0.1"wg placed on the unit up-blast fans.