

## **Silencer Shell Lagging**

There is only one valid reason for lagging the shell of a silencer. That is to control shell noise and thereby reduce the overall noise level of a rotary PD blower package.

All silencers have some shell noise. It is a result of the energy being dissipated within the silencer. Some of this energy is transmitted through the shell to the outside environment. The amount of transmitted energy can be controlled by the use of laminated shells; a measure Stoddard Silencers' designs incorporate. Even with this measure, some shell noise remains.

There is a widely circulated misconception that controlling this residual shell noise with lagging will reduce the blower package noise level. At best, this is a half-truth.

Blower package noise consists of vibration, mechanical and air noise. At three feet from the blower (the normal measuring point for noise levels) the sources of these noises are indistinguishable. As an example, shell noise cannot be differentiated from belt noise.

Numerous sophisticated noise studies run by Stoddard Silencers have shown that of the eight to ten noise sources present on the standard blower package, shell noise is sixth or seventh in intensity. In addition, the shell noise is 10-12db (decibels) below the most intense noise sources. What this means is the shell noise is masked by the other sources and that it does not add to the overall noise level of the package.

From a practical standpoint then, lagging the silencer without first treating the other more intense noise sources is a waste of effort and money. Lagging must be part of a fully integrated noise control program in order for it to be effective. Any suggestion that simple lagging will cure a packager's noise problem is therefore, irresponsible.

Stoddard Silencers will provide engineering assistance to help the customer establish a program which will identify and then control the noise sources in a blower package.

In recent years another motive has been falsely given to justify shell lagging.

Food and wastewater treatment applications raise the concern about "blowing out" the acoustic material ("pack") in a chamber-absorption silencer. Such concern is without justification, IF, the silencer manufacturer uses sound design parameters in the manufacturing of its product. In these cases no "blow-out" will occur. With prudent selection of "pack" material and its retainer, the pack will be secure and will perform its function.

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That function is to remove high frequency noise from the air stream before it enters the main body of the silencer thus preventing shell ring. Shell ring is a type of shell noise far in excess of normally accepted levels. If the pack is omitted the shell ring can be masked by lagging; however, this treats the symptom rather than the cause. The high frequency noise is not removed by this approach and continues to remain in the system. On the discharge side of the blower this causes noise and structural problems downstream of the package. On the inlet side, the noise travels back through the silencer and filter (if any) and out into the surrounding environment. Noise does not follow the airflow.

When the blower package is located indoors with the intake filter located outside, the blower package will seem to be within acceptable noise levels. Unfortunately experience has shown that the neighbors will be hearing the high frequency noise that the silencers have not treated. If the air filter is indoors then the personnel working nearby will be exposed to noise levels in excess of OSHA standards.

Through extensive research and development, Stoddard Silencers has engineered silencers with pack sections that provide proper attenuation with the required unit integrity. In thousands of blower applications, Stoddard has not had a case of “blow-out” given proper silencer selection and installation. We would be pleased to assist your company in selection the proper silencer and provide installation advice for any rotary blower package.

We trust this will explain the complex issue of shell lagging and assist the engineer in specifying and the packager in supplying the best engineered and built blower package available.



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