



THE SOUND *of Silence*

EFFECTIVE SOUND CONTROL IN HOSPITALITY SETTINGS

By Jacob Wexler, FDAI

To be successful, today's hotels must accommodate a wide variety of customer needs. Having clean and comfortable guest rooms is only the beginning. Hotel guests require a lengthy list of amenities, a reasonable level of security and, above all, silence.

For years, hotel guests have been subjected to being awakened at all hours by conversations, laughter and the slamming of other guest doors in hallways. In cities like Miami and Las Vegas, where occupants are coming and going at all hours and in varying states of sobriety, the constant noise can result in very unhappy guests whose dissatisfaction will be quickly broadcast to the world via social media.

Not only is there the issue of outside noise coming into a guest or conference room, there is also the very real risk that any sensitive information shared inside the room could be overheard by passersby.

At hotels with conference rooms, noise leakage can be a much more serious problem. If the room has not been properly sound proofed, any noise from the adjacent areas can interrupt business meetings or presentations. Whether it's the clattering of dishes by caterers or the cacophony of sounds from a casino, it will be an unwelcome distraction that won't be forgotten by the much sought-after business clientele.

But not only is there the issue of outside noise coming into a guest or conference room, there is also the very real risk that any sensitive information shared inside the room could be overheard by passersby. In extreme cases, this could even result in lawsuits being filed over breach of privacy.

The problem of noise is an obvious one, but solving it with effective sound control remains one of the most demanding of all challenges for door openings in hotels, office buildings, schools, hospitals and any other setting where privacy is a concern. As requirements grow, failure to meet expectations is certain to cost someone some money. Specifiers may be at risk for failing to specify the right assembly to prevent noise problems. When installed and assemblies fail to deliver the specified level of

sound control, both the job and expense of making it work belong to both contractors and the distributors who advised them.

Understanding acoustics and its application to door openings is the necessary first step to minimizing those risks and potential costs. For high-performance sound control challenges, the next step would be to consult with an acoustical engineer to ensure proper results. This article is intended to help non-experts avoid the common pitfalls and specify the appropriate products to meet the diverse challenges of noise in hospitality facilities.

Gaps = Noise

Because the science of sound is vast, it cannot be distilled down to a few simple bullet points. However, there are some key points to understand, the most important being that gaps equal noise. The seemingly obligatory two-inch gap at the bottom of each hotel room door is what ensures that every sound from the hallway is heard clearly in the guest rooms. This is because sound waves travel through any opening with very little loss.

While the amount of air flowing through a gap increases in proportion to the size of the gap, *the size of the gap in a sound barrier does not matter*. A tiny hole transmits almost as much sound as a much larger gap. (See Figure 1)

Because of this phenomenon, any unsealed gaps and clearances in door assemblies effectively cancel out the noise reduction benefits of sound doors.

One of the most common reasons that acoustical doors fail to deliver sufficient noise control is poor quality or insufficient acoustical gasketing. Without acoustical gasketing, even openings with high-rated doors perform very poorly at blocking sound. For acoustical assemblies to be effective at blocking sound, the gasketing that seals the door around head, jamb and sill must remain complete, uninterrupted and air-tight throughout the service life of the assembly. For

uninterrupted contact, the gasketing must be installed all on the same side of the door and frame.

Performance also depends on good surface contact between the gasket and door edge or frame, which can usually be achieved using compression seals. However, gaps caused by imperfect door alignment are a common problem in newly installed gasketing and can also surface later on as buildings shift and settle and doors cycle through changes in temperature and humidity.

To ensure consistent performance over time, look for adjustable features in the design of acoustical gasketing. There are basic models that allow the use of a screwdriver to restore a sound-tight seal when clearances increase for any reason.

Sound Thresholds

Thresholds are another area that can often pose difficulties for sound control, particularly when specifiers are unsure of the type of flooring being used in the opening. A poor selection can result in a significant amount of space between the bottom of the door and the finished floor, which can render acoustic doors ineffective. Concealed automatic door

bottoms offer an elegant solution to the problem.

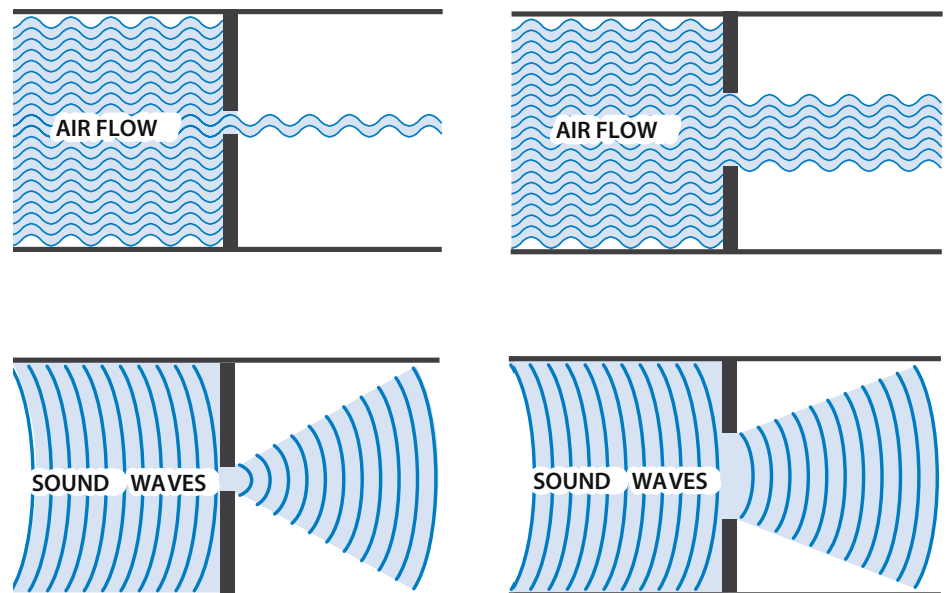
While the configurations of this type of secure seal are endless, the automatic door bottom can be activated in one of two ways. The first is the traditional opening and closing of the door. When a door is closed, the threshold will act as a latch, activating the door bottom and allowing the seal to drop down. When the door is open, the pin that hits against the stop will retract into the door bottom, and the seal will be concealed into the housing.

The more innovative approach is to have an electronically retracting door bottom that can be activated with a switch. The switch can be either a keypad, a key switch, or a standard momentary switch with no credential requirements. This feature is extremely useful in settings where sound control is particularly important, such as guest or conference rooms.

The Devil's in the Details

Even the best gaskets and highest quality acoustical assembly can be rendered ineffective by improper specification or installation. When specifying gasketing for hospitality facilities, here are some key points to remember:

Figure 1: Sound Control



Although specifications are an important element, many of the errors involving gasketing are the result of improper installation.

- In high-use facilities like hotels, door openings are often gateways for the unwelcome spread of microbial contaminants. Antibacterial rubber gaskets are a practical solution for minimizing microbial exposures to help maintain a sanitary environment.
- Ensure the gasketing specified does not interfere with any other hardware on the door (pivots, cylindrical locks, electronic hardware, surface mounted closers, concealed vertical rods).
- Ensure that mounting hardware locations are adjusted for any brackets that must be used on perimeter gasketing.
- Mounting brackets should always be used when there is surface mounted hardware that will interfere with gasketing.
- Finger guards and finger protection hardware on both the hinge and lock side are imperative for the protection of children. In addition, the extra seal protecting the hinges can provide additional security by preventing tampering.
- Fire exit hardware or panic hardware must be properly undersized to allow for the mounting bracket over the seal. This is typically an instruction to be given to the contractor or installer, as this type of hardware is generally field modifiable.

But although specifications are an important element, many of the errors involving gasketing are the result of improper installation. The following are some tips to ensure gasketing integrity is not compromised in the field:

- To ensure guest security, it is imperative to avoid frames without stops, also known as cased

open frames. Due to the design of these frames, the gasketing can be easily removed with a screwdriver, leaving the door unsecured. In a situation where a cased open frame is already installed, the heavy-duty rated gasketing that acts as the stop should be mounted with security fasteners to inhibit tampering.

- A magnetic lock should only be used with the proper mounting bracket recommended by the manufacturer to avoid interference with the continuous seal.
- The mounting of other hardware onto or overlapping gasketing must be looked at carefully to ensure the seal has not been compromised, particularly in highly secure openings.
- The practice of notching out gasketing for other hardware is dangerously common as many specifiers and installers either ignore or are unaware of the need for a continuous seal and notch out an appropriate space within the gasketing for other hardware. However, this notching of gasketing creates two potential risks to occupants. The first is a security issue, as the break in the gasketing creates an access point to the secure side of the opening. The second is an even more serious threat to life safety as the door assembly was not tested with that type of modification. This is of particular concern with fire doors, where any breaks in the seal are likely to result in leakage of smoke into a room.
- The integrity of the seal is immediately lost once the seal has been cut to allow for a strike or a surface mounted closer. For this



Figure 2: Proper installation of security bracket

reason, it is mandatory to use security brackets over any perimeter seal. *Figure 2* shows the proper way to install a security bracket to allow for a surface mounted roller strike to be installed. The security bracket allows for a continuous seal around the opening, which is consistent with the test that was successfully performed on the opening prior to rating. In addition, the security bracket makes it difficult for the hardware to be tampered with.

Conclusion

These are just a few of the many challenges that specifiers and installers can face when dealing with the problem of noise in any hospitality facility. Specifiers can find additional details on gasketing and acoustical assembly issues in NFPA 105 (2016) – *Standard for Smoke Door Assemblies and Other Opening Protectives*, and NFPA 101 (2015) – *The Life Safety Code*.

To minimize costs and potential liabilities, door and hardware professionals advising designers and owners should consult with acoustical engineers and insist on hiring expert installers. ■



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