

Comparing Acoustic Flooring in Healthcare



From nervous patients to anxious visitors to overworked nurses — maintaining a level of tranquility in healthcare settings can be a never-ending challenge. Creating spaces that elicit peace and calm requires identifying and mitigating environmental stressors.

While there are many factors that contribute to increased stress for hospital occupants, noise is seen as one of the top offenders. In fact, “quiet at night” is one of the [lowest scoring categories*](#) for Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS).

Elevated and unexpected sounds can impact patient outcomes through reduced sleep and the need for additional medication, which can ultimately result in longer hospital stays. For nurses and other frontline staff, noise can lower speech intelligibility and impact decision-making. It can also lead to decreased mental efficiency, short-term memory loss and overall weariness.

How the built environment can reduce noise in healthcare settings

While hospitals can be filled with both routine and unexpected sounds, there are a variety of ways to help reduce or mitigate unwanted noise. Some of them include:

- Reducing the frequency and intensity of medical alarms
- Using ambient white-noise machines
- Installing sound-absorbing ceiling tiles

While often overlooked in healthcare settings, flooring can have a significant impact on reducing noise levels and contributing to the overall health and wellness of patients and staff.

Flooring acoustics undervalued in healthcare environments

A variety of noises, including footfalls, rolling loads and dropped objects, can be directly tied to flooring. While hospitals are required to be clean and sterile at all times, many types of flooring that offer enhanced hygienic properties also tend to have poor acoustic characteristics.

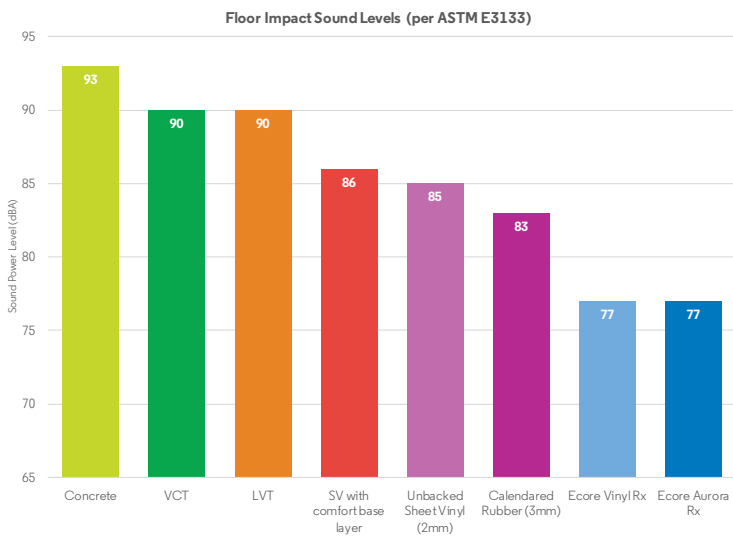
The phenomenon known as the “Cocktail Party Effect” is when people raise their voices to be heard over other talkers. Left unchecked, this can snowball into everyone shouting to be heard, like what happens in a crowded restaurant or bar. Hospitals should strive to reverse engineer this theory by lowering noise levels to help create a sense of peace and calm. For example, flooring that contributes to reduced sound levels may actually encourage people to lower their voices since the space around them is quieter.

How evidence-based design supports patient outcomes

Evidence-based design (EBD) helps architects and designers make informed decisions around design specification using quantified research. EBD takes into consideration a wide range of experiences that can impact occupants, including visibility, paths of travel, ergonomics, acoustics and more.

EBD has been widely studied in hospital environments. The test results below supports EBD by demonstrating how the acoustical qualities of flooring have a direct effect on the reduction of impact-radiated noise, which can improve communication and wellness.

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Flooring such as Ecore’s Rx Collection, which feature a vinyl wear layer fusion bonded to a vulcanized composition rubber (VCR) backing, are designed to reduce the sound generated by impact energy. By striking the perfect balance between force reduction (energy absorbed by the surface) and energy restitution (stored energy released into the object), premium rubber flooring changes the characteristics of sound and reduces noise levels. Common VCT and LVT generate a 146% increase in perceived loudness relative to fusion-bonded flooring products.

Fusion-bonded flooring manages impact energy

When an object hits a surface, the energy is distributed in a variety of ways. It is pushed back into the object (bounce), it goes into the room and surrounding areas (noise), and it is absorbed by the floor (heat). Noise created by the impact can be grouped into two categories:

- In-room impact noise, which influences the sound level in the room
- Transmitted impact noise, which affects the sound level in an adjacent room

Flooring featuring VCR can soften the impact, resulting in less impact noise from footsteps, rolling carts and dropped objects. VCR flooring creates the necessary “give” that increases impact time and helps to change the characteristics and reduce the amount of noise that is emitted.

Comparing the energy absorption of flooring

Ecore conducted two studies comparing Floor A (5mm VCR layer fusion bonded with 2 mm calendared rubber top layer) versus Floor B (3 mm calendared rubber).

The first test measured decibel levels between Floor A and Floor B using the new ASTM E3133 standard for measuring the floor impact sound of floor coverings. This testing shows that Floor B generates a 50% increase in perceived loudness relative to Floor A. By adhering to ASTM standards, it allows architects and designers to make a valid comparison of the performance of different floors.

Ecore’s second test used a Deltac Field Tester to measure force reduction (how much a floor absorbs energy) and energy restitution (how much a floor returns energy) for both floors.

	DECIBEL TESTING	FORCE REDUCTION	ENERGY RESTITUTION
Floor A	77 dB(A)	11.2%	67.4%
Floor B	83 dB(A)	-0.2%	80.6%

Why engineered flooring is ideal for healthcare environments

Creating quiet and safe healthcare spaces can improve patient experiences and outcomes while supporting enhanced wellness for staff. Engineered floors featuring itsTRU™ technology offer the benefit of enhanced acoustics while satisfying hospital mandates for hygienic and easy-to-clean surfaces.

In addition to improving acoustics in hospitals, flooring in the Ecore Rx collection delivers outstanding ergonomic benefits with every step. Available in a variety of styles and finishes, Ecore Rx flooring also offers seamless, easy-to-maintain and hygienic solutions because of heat-welded installation. Ecore Rx floors can improve the hospital soundscape and, in turn, enhance patient and staff wellness.

* “Summary of HCAHPS Survey Results.” October 2018 to September 2019 Discharges, Hospital Consumer Assessment of Healthcare Providers and Systems, hcahpsonline.org/globalassets/hcahps/summary-analyses/summary-results/july-2020-public-report-october-2018-september-2019-discharges.pdf.