

# HOW IS SOUND MEASURED?

## Volume

is most often measured in decibels (dB), it refers the amount of sound energy present.

## Frequency

is measured in hertz (Hz) and refers to the length of the sound waves, lower frequencies have larger (or longer) waves, higher frequencies have shorter waves.

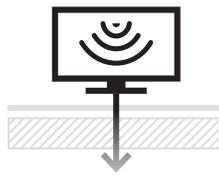


## Sound Abatement

The three primary measurements of sound abatement are **IIC, STC, and NRC**. Each test focuses on a different type of sound absorption or transmission. These tests are used to measure the sound abatement properties of various finishes, furniture products, or construction materials.



**IIC**  
Impact Insulation Class



**STC**  
Sound Transmission Class



**NRC**  
Noise Reduction Coefficient

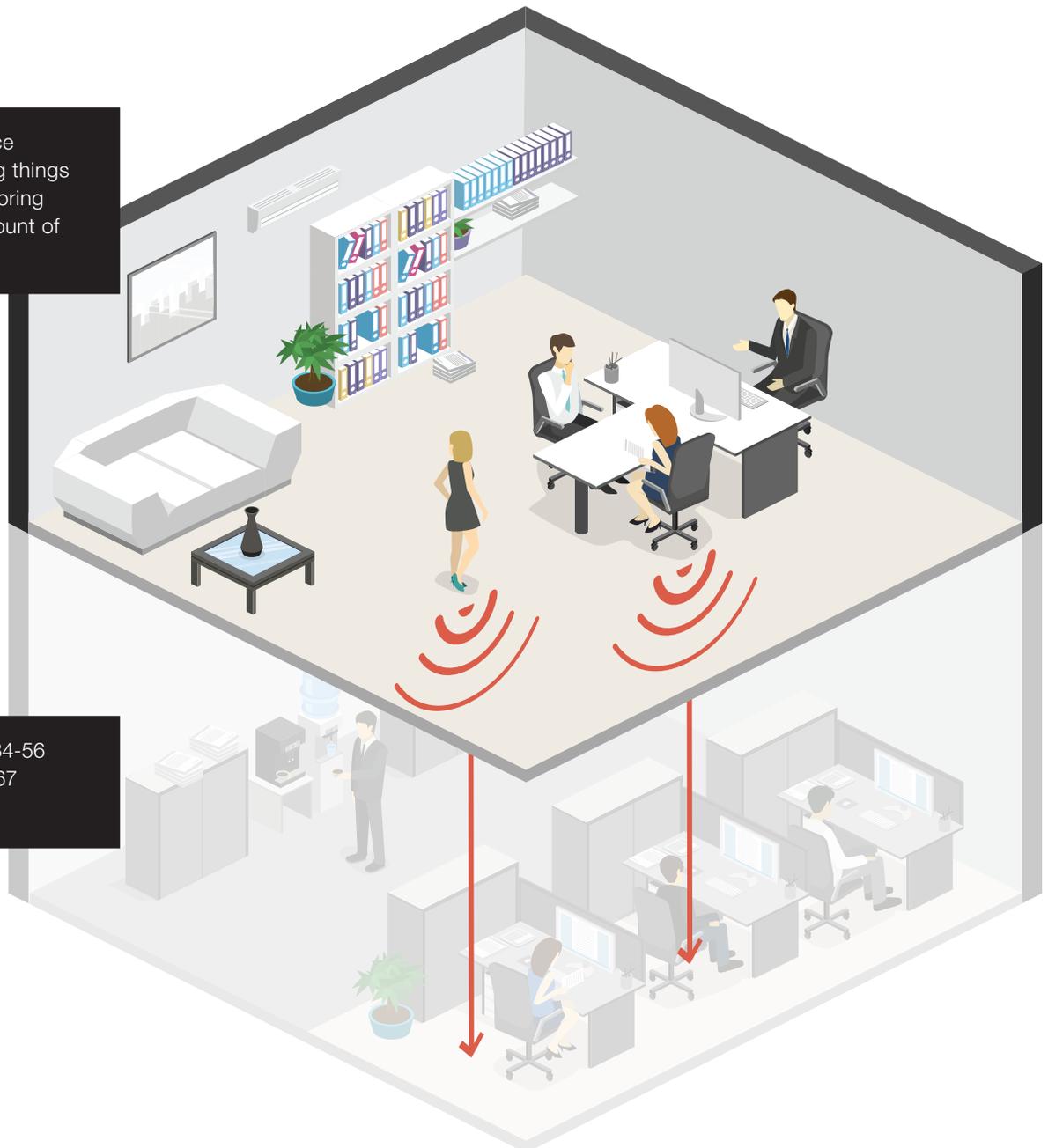
IIC



**Impact Insulation Class** is a measurement of the amount of impact energy absorbed by the product. This test is designed for floor and ceiling materials. A machine taps on the floor repetitively with metal hammers. A device in the room below measures how much of that energy is absorbed or transferred through to the room below. For flooring products there are two factors to consider, what is the result of the hammer striking the floor and how does the product transfer energy.

If the space above will experience people walking around, dropping things or moving furniture a high IIC flooring product will help reduce the amount of noise heard in the room below.

LVT products can have an IIC of 34-56  
 Carpet tile can have an IIC of 61-67  
 (8" concrete slab without ceiling)



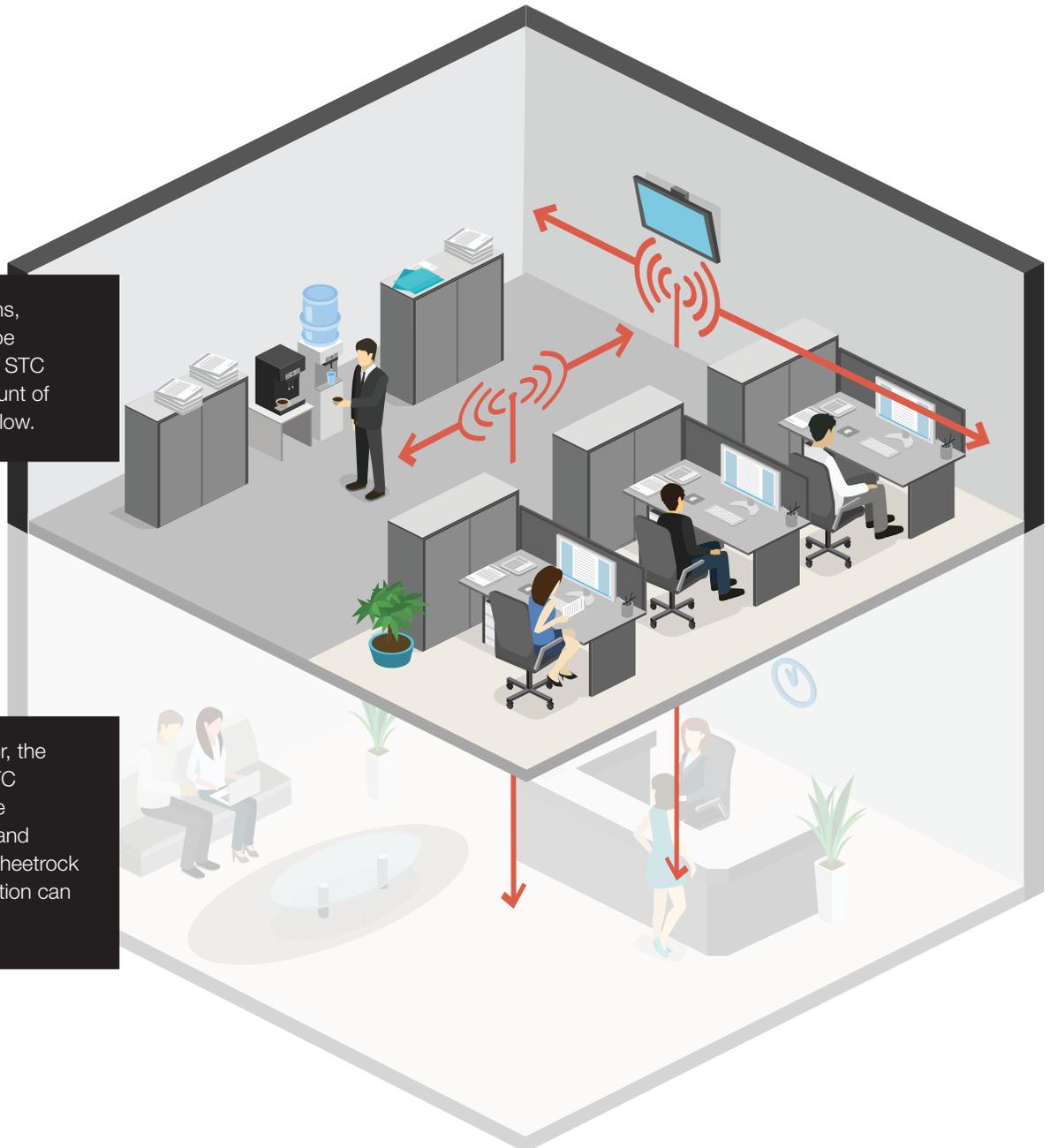
STC



**Sound Transmission Class** is a measurement of the amount of airborne sound energy the product prevents from transmitting from one room to another. A loud noise is played in one room and a device measures how much of that sound energy is transmitted into the next room (above or below).

If airborne sound like conversations, music, TV's, or dogs barking will be present in the room above, a high STC product can help reduce the amount of sound transmitted to the room below.

When measuring STC floor to floor, the flooring choice can impact 1-3 STC points, the largest contributors are the floor and ceiling construction and materials. For example adding a sheetrock ceiling to an 6" concrete construction can add as many as 9 STC points.





**Noise Reduction Coefficient**- this test measures the amount of sound energy absorbed by a product such as flooring, ceiling tiles, fabric or furniture. This test is relevant when considering in room acoustics. With this test we can start to see how two spaces with the same amount of sound energy may sound different from one another. How quickly the sound dissipates and how it reflects in the space will change how we perceive sound in the room.

This test is performed by directing sound at an object and measuring the amount of sound that reflects back or is absorbed. An NRC of 1 means that 100% of the sound energy is absorbed an NRC of 0 means that none of the sound is absorbed.

Soft surface flooring provides greater sound absorption with NRC results ranging from .15 to .7 depending on tufted weight, backing, and overall construction. Hard surface flooring generally have very low NRC results ranging from 0 to .10 depending on thickness and underlayment.

