



Decay, Absorption, and the Limits of RT60 Estimates

<https://musicreason.com/resources/decay-absorption-and-rt60-estimates/> · Last updated 2026-09-06

RT60 is the time it takes a sound to decay by 60 decibels after its source stops, a standard, widely cited measure of how "live" or "dead" a space sounds. The Sabine formula estimates it from a room's volume and its total absorption, under assumptions no real room fully satisfies.

The Sabine formula, on your own numbers

A 100 cubic meter room with 20.7 sabins of absorption has an estimated RT60 of 0.778 seconds. The formula is $RT60 = 0.161 \times V / A$, where V is room volume in cubic meters and A is total absorption in metric sabins. [RT60 Estimator](#) runs this same calculation; [Room Treatment Estimator](#) rearranges it to solve for the absorption needed to reach a target RT60 instead.

Diffuse-field assumptions do not hold everywhere

Sabine's formula assumes sound energy is evenly diffused throughout the room and that every surface's absorption behaves the same way across frequency. Real rooms violate both assumptions, especially at low frequencies, where discrete room modes (see [Room Modes and Low-Frequency Behavior](#)), not diffuse decay, dominate the room's actual behavior.

An estimate compares scenarios; it does not diagnose a room

Room Treatment Estimator's output (an amount of added absorption) is a comparison between idealized scenarios, not a specific product recommendation or an acoustic diagnosis. A real measurement of an actual room's decay requires instrumentation this browser-based calculator does not have access to.

Where RT60 fits alongside other room questions

[Schroeder Frequency Calculator](#) estimates the frequency above which a room's behavior starts resembling the diffuse field Sabine's formula assumes; [Speaker Placement Explorer](#) addresses a related but separate question, where to physically put speakers and a listener.

Frequently asked questions

What does RT60 actually measure?

RT60 is the time it takes for a sound to decay by 60 decibels after the source stops, a standard measure of how "live" or "dead" a space sounds. The Sabine formula estimates it from room volume

and total absorption.

Why is the Sabine formula called an idealized estimate rather than a measurement?

It assumes sound energy is evenly diffused throughout the room and that every surface's absorption behaves uniformly across frequency, assumptions no real room fully satisfies, especially at low frequencies where room modes (not diffuse decay) dominate.

Can Room Treatment Estimator tell me exactly what acoustic panels to buy?

No. It estimates the additional absorption (in sabins) needed to reach a target RT60 under the same idealized assumptions; translating that number into specific products and placement is outside its scope and stated as such.

Where this shows up

ACOUSTICS

RT60 Estimator

ACOUSTICS

Room Treatment Estimator

ACOUSTICS

Schroeder Frequency Calculator

ACOUSTICS

Room Mode Calculator

ACOUSTICS

Speaker Placement Explorer