Acoustics 101

Dark mode

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Acoustics are important.

Offices. Restaurants. Auditoriums. Hospitals. Schools. Lobbies.

Everywhere you are, sound is too. Left unchecked, sounds become noise. Any environment can be acoustically unbalanced.

Sound ▸ Sound is the term to describe what is heard when sound waves pass through a medium to the ear.

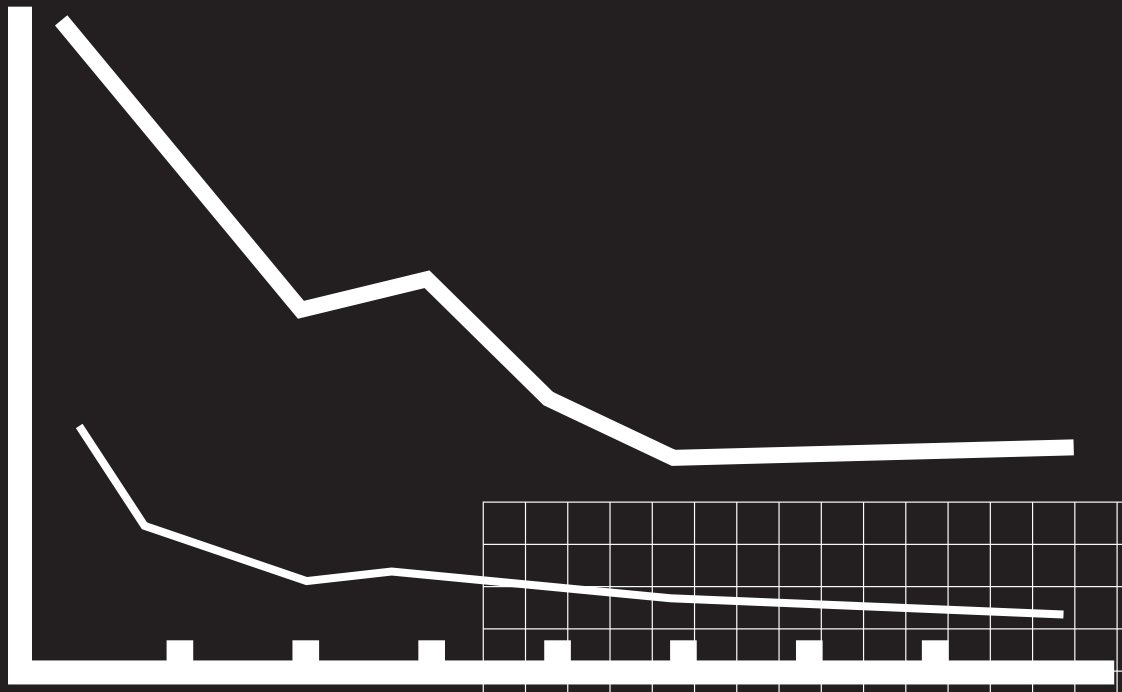
Think of "sound" as an all-encompassing term for everything you hear. Anything quiet, loud, good, bad, it's all sound. We won't bother with the "if a tree falls in the forest" bit though.

Sound vs. Noise

This is what acoustic solutions absorb

Noise is any unwanted, unpleasant, or distracting sound. Imagine the echoes that make you dread a certain conference room, or the inability to talk with your date at dinner.

Noise ▸ Sounds that are unwanted (i.e. what Conwed gets rid of).



RT60 test ▸ The decay time of audible frequencies in a space.

How noise is measured.

The amount of noise in a space can be measured by an RT60 test. You can perform one yourself using any of the free apps online.

All it takes is clapping your hands once when the space is quiet to produce a chart like the one above.

The chart represents the frequencies we can hear, and how many seconds each takes to decay to being inaudible.

Room tone ▸ The general term for a space with a comfortable, and relatively appropriate amount of reverberation.

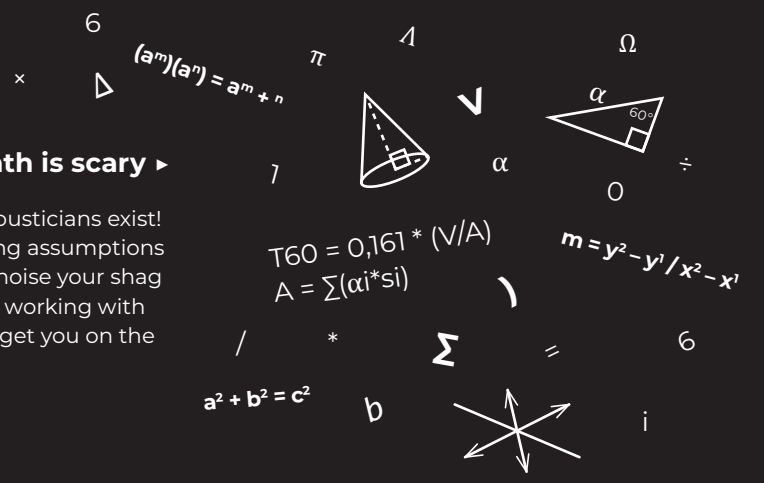
Calculating coverage is (literally) **not straight forward.**

It's an easy mistake to think a room twice as large as another needs twice the acoustical coverage. Not only is the math non-linear, but there are many factors that determine just how much coverage is needed to achieve good room tone.

A 20×20×15 room needs 250sqft of our 2" panels for room tone, assuming it's all hard surfaces. If it were a quiet reading space, 450sqft would be appropriate. If the floors were 3" thick shag carpet, only 120sqft.

Acoustical math is scary ▸

And that's why acousticians exist! Rather than making assumptions about how much noise your shag carpet will absorb, working with a professional will get you on the right track.



Average sound decay time in seconds ▼	
10.00	Stadium concert
5.00	Conference room with all hard surfaces
3.50	Noisy restaurant
2.00	Average restaurant
1.50	Concert that's too quiet
1.00	Comfortable restaurant
0.50	Comforable conference room
0.25	Excellent classroom

Loud ≠ Noise.

Have you ever been in an office space that's too quiet?

Different environments should have different acoustic performances. So don't sweat it if your venue isn't dead silent.

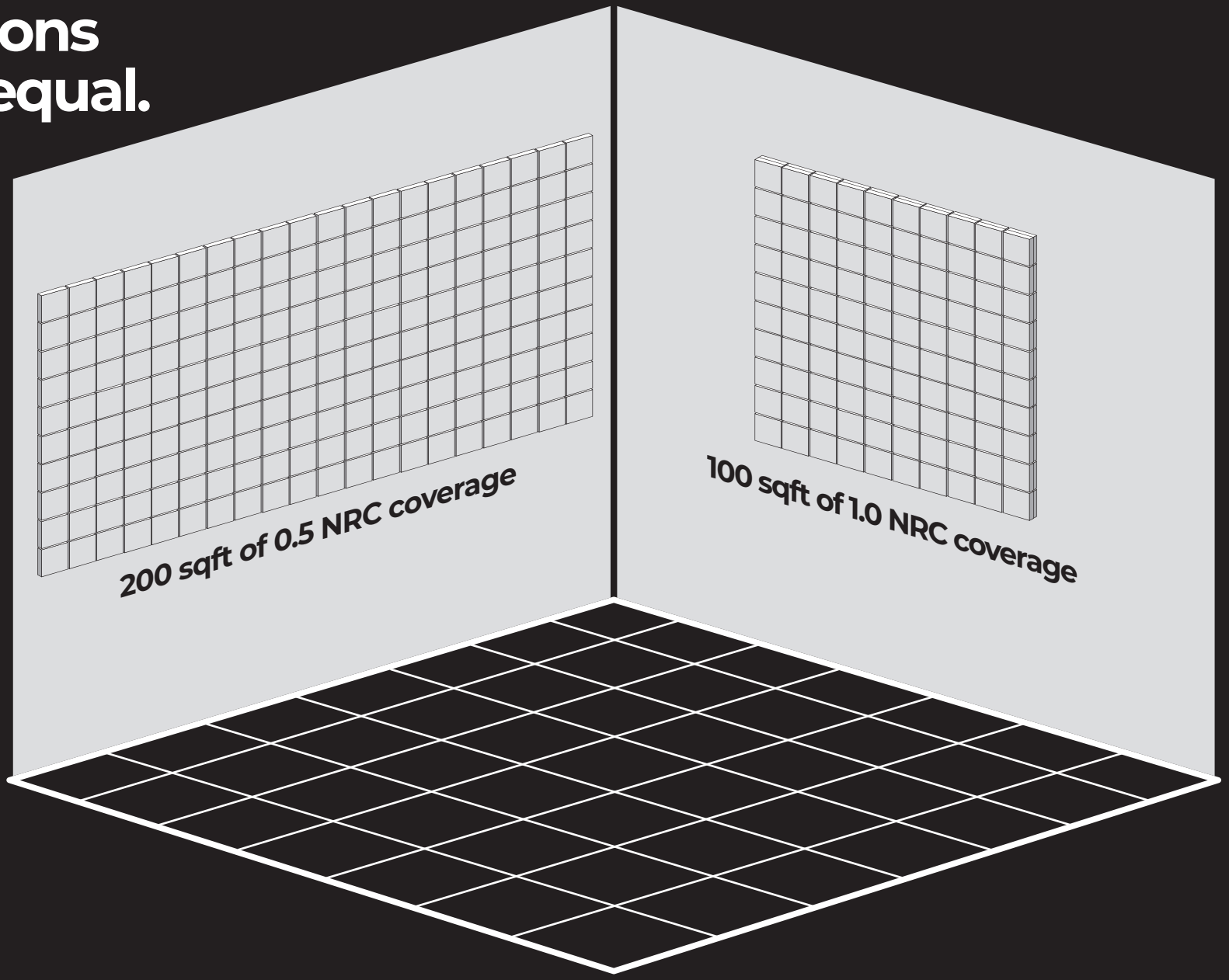
Not all solutions are created equal.

A product's NRC value represents how well it absorbs noise. An NRC of 1.0 absorbs just about all noise that comes in contact with it, while a 0.0 absorbs nothing.

Keeping that in mind, these two examples of panels offer the same amount of acoustical performance. When you're creating your acoustic solution, be mindful of NRC values and how manufacturers go about verifying their scores.

Conwed submits all products to an accredited NVAP Lab for ASTM C423 acoustical testing.

In this example, both of these solutions have roughly the same acoustical performance.



Ceiling solution

▲ A great place to catch bouncing noise, and hide things like electrical or pipes. Conwed solutions can be customized so that accessibility to the ceiling is not a problem down the road.

Placing your product

It's not *all* about square footage. Depending on the shape and surfaces of your space you may need products placed in different areas to best absorb noise.

Wall solution

◀ Most wall solutions are customized in an aesthetic way, since they're in line of sight. Consider a mosaic of custom shapes, or printing custom images to the surface for a little flair.

Materials & methods matter (and there's a whole lot of them)

Not all materials help noise (some make it worse).

Things that absorb noise

Fiberglass ▸ An industry-standard that gets the jobs done. Can be finished in a variety of materials.

No-added-formaldehyde (NAF) ▸ The same as standard fiberglass, but much better for LEED points.

Felt ▸ A material made from matting, pressing and condensing fibers together.

Wood fibers ▸ Shredded fibers mixed with other agents to form a moderate-performing, wood board substrate.

Acoustical plaster ▸ A specialized mixture that if applied correctly, can appear like drywall, while still absorbing.

Acoustical glass ▸ We think it's some sort of magical material.
Pretty sure it just blocks noise though, doesn't absorb.

Wool ▸ Compressed wool fibers that perform well but are hard to handle.

Finishes

The outermost layer of the product. Also impacts durability, cleanability, and accessibility.

Paint ▸Thin layers of paint carefully sprayed onto a drywall-like top layer.

Fabric ▸ Acoustically-transparent textiles adhered to the surface. Conwed uses Hotmelt to fuse the fabric to the core, whereas other manufacturers use common glue adhesives.

Print ▸ A custom image applied directly to a scrim layer adhered to the core.

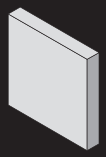
Copolymer ▸ A highly durable blend of plastics that adheres to the surface, providing protection to the absorber underneath.

Felt ▸ Also usable as a finish, in case you want the look of felt on the outside, but want the high performance of fiberglass underneath.

Wood ▸ Wood itself is reflective, but if microperforated it can allow some noise to pass through. Not budget-friendly.

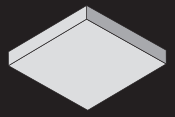
Combinations of these materials & methods are then made into different products.

These are some industry standard product names.



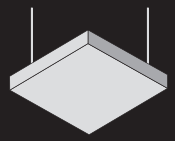
Wall Panels

A true classic and the most customizable, these can be found in any type of space you can imagine.



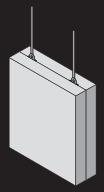
Ceiling Panels

Think wall panel, but on the ceiling. A solid choice when wanting to keep your walls smooth and your floors hard.



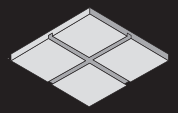
Clouds

Imagine that ceiling panel, but now gently suspended, creating space behind the solution for fixtures, pipes, ducts, or any other obstacle.



Baffles

Now take that cloud, and hang it vertically. Arrays of baffles are commonly used to intercept noise in the midst of a space and visually distinguish areas.



Tiles

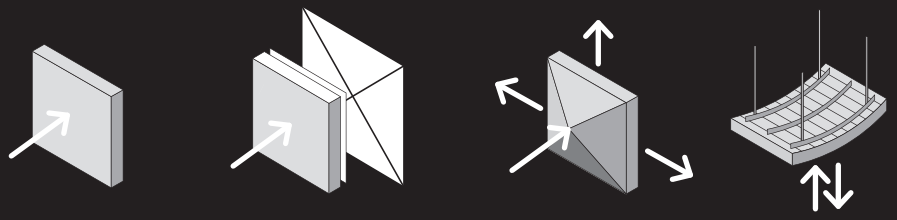
Tiles laid in grids is a hallmark of commercial buildings, only with Conwed, yours can be high-performing, and highly-tailored.

Eurospan ▸
If you'd rather keep the smooth look of your drywall surfaces, then buddy do we have the solution for you. Replace your entire ceiling with one smooth, seamless acoustical surface.
conwed.com/eurospan

Some spaces need additional tuning.

You may need to reflect sound in different directions, or scatter frequencies that are getting trapped in a corner. We call these solutions “Specialized”, and they can serve four different functions. These products are made by adding additional materials, layers, and shapes.

Core Products | **Specialized**



Absorb

Noise absorption is a product trapping sound waves, preventing reverberation. Sound can still pass through and around the product, but the better it absorbs, the less noise will escape it.

Block

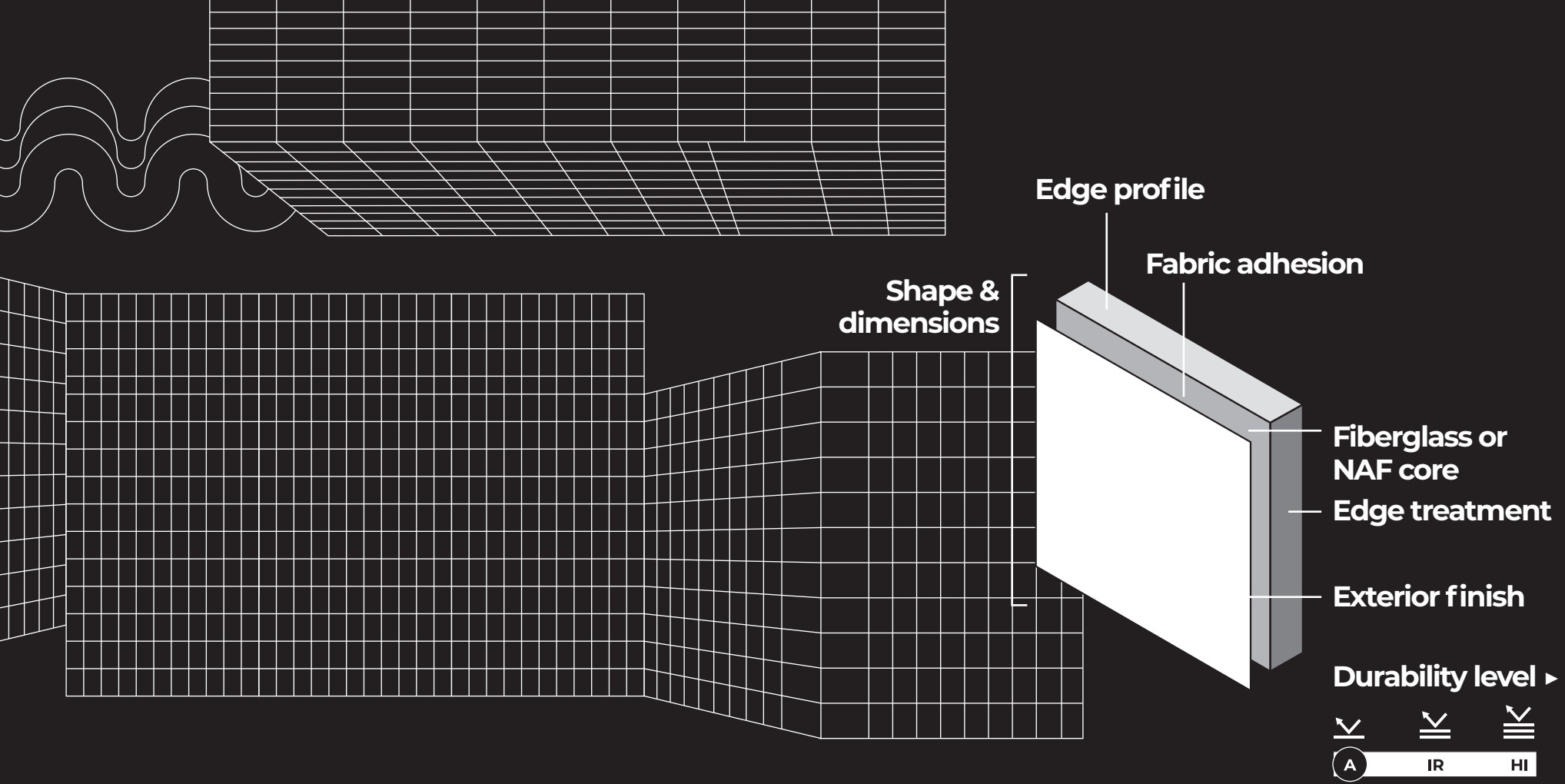
Blocking noise does not quiet the room where the noise is. Rather, it prevents noise from passing through a wall or ceiling, keeping other spaces quiet.

Diffuse

Diffusion is scattering a soundwave into multiple directions, ensuring all frequencies are distributed throughout a space.

Reflect

Reflection is bouncing a soundwave back to the source, or redirecting it somewhere else; preventing soundwaves from being trapped in high spaces.



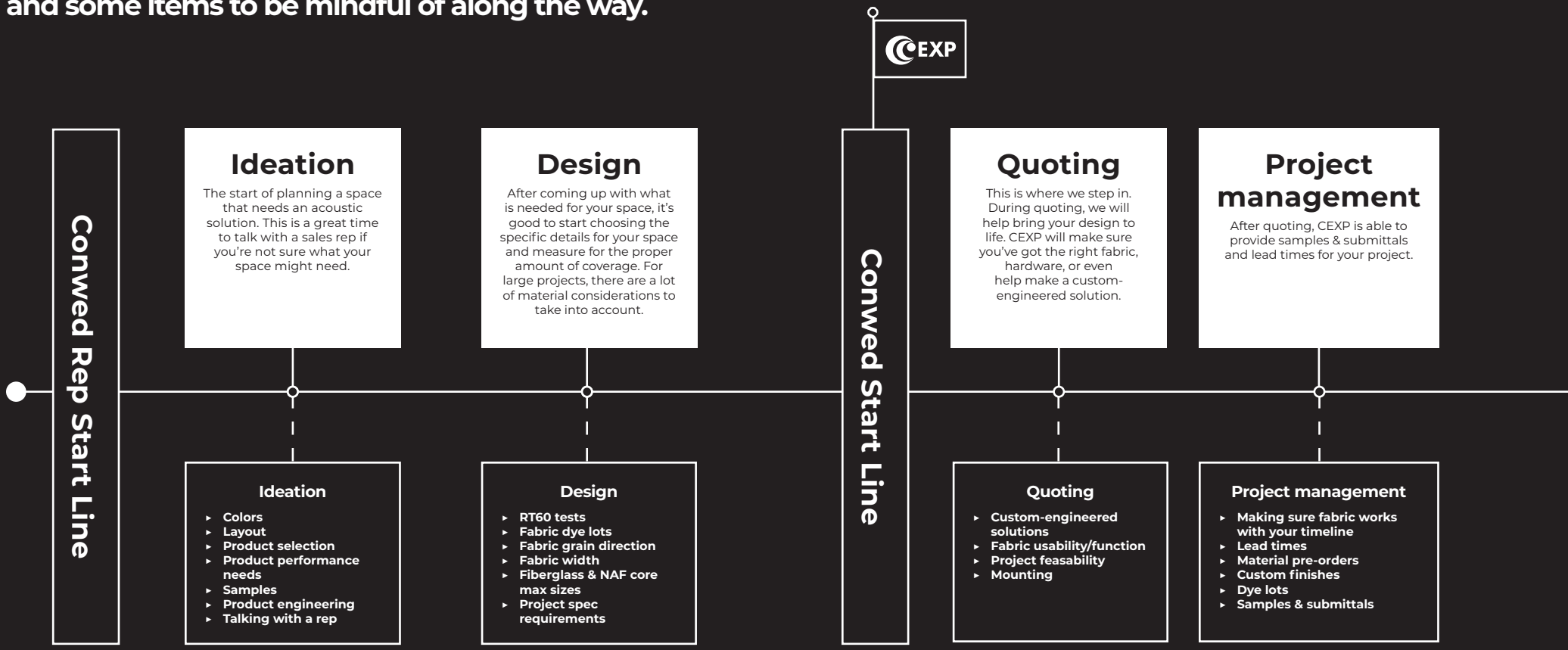
Customizing your product.

Once you know you need acoustical treatment, it's time to start designing! Our products are all made-to-order. Shapes, thicknesses, the finish, edge details, and more, are all up to you.

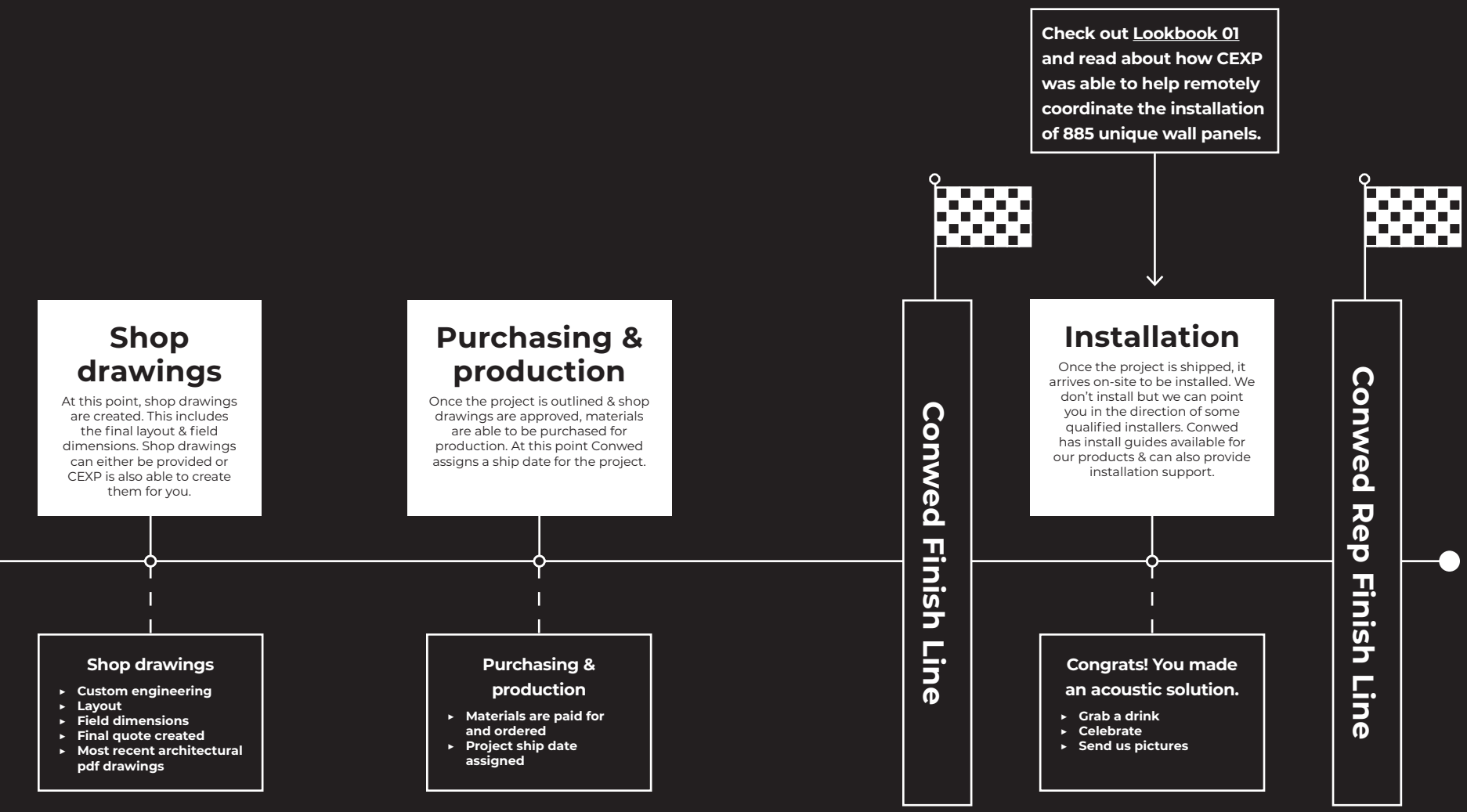
For a full breakdown of what each product can do for you, pull up the corresponding datasheet at conwed.com/resources

Typical project flow

Here are all the major steps in the average project, and some items to be mindful of along the way.

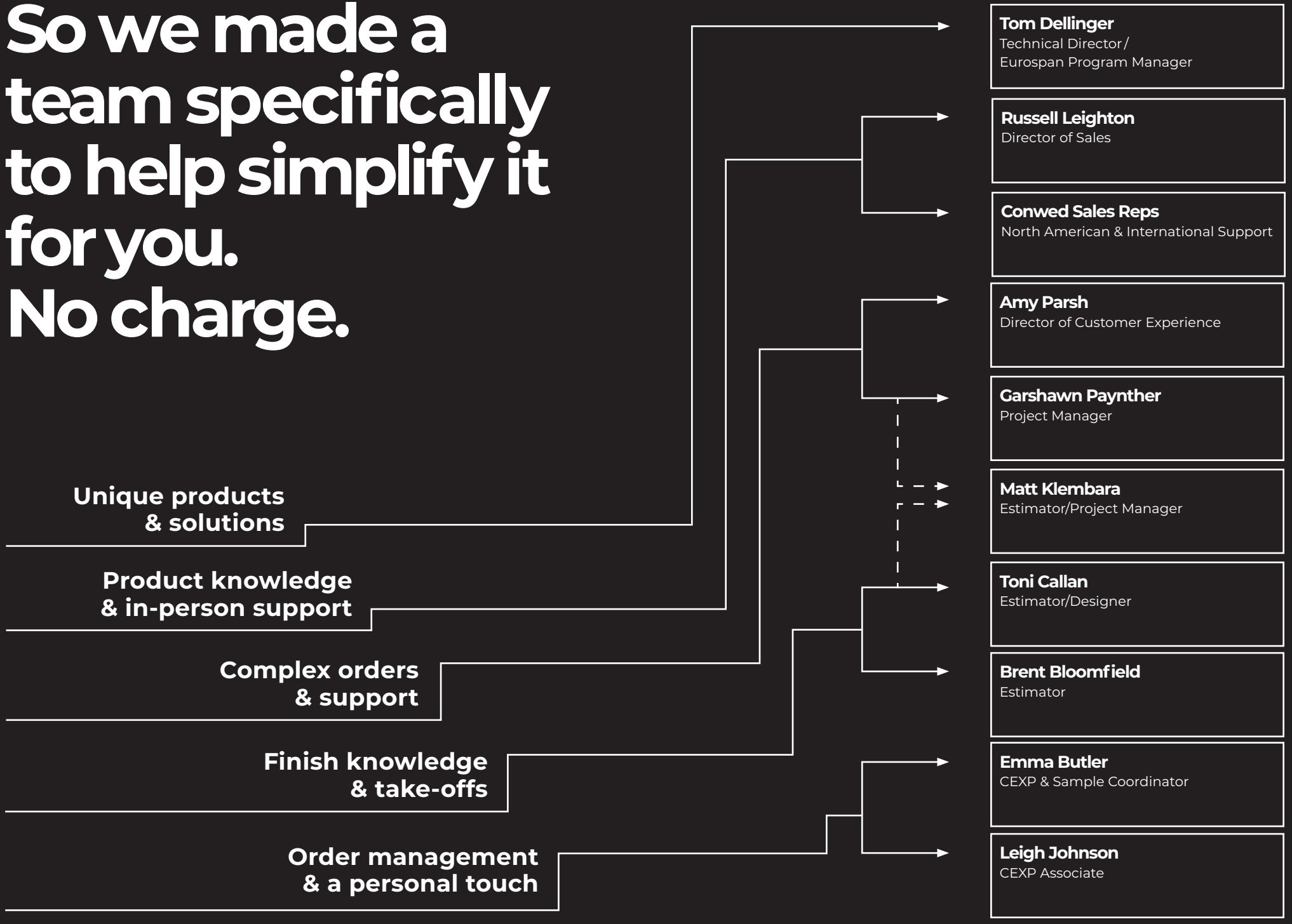


Contact a rep ▸
conwed.com/contact


Check out Lookbook 01 and read about how CEXP was able to help remotely coordinate the installation of 885 unique wall panels.
Shop drawings
At this point, shop drawings are created. This includes the final layout & field dimensions. Shop drawings can either be provided or CEXP is also able to create them for you.
Purchasing & production
Once the project is outlined & shop drawings are approved, materials are able to be purchased for production. At this point Conwed assigns a ship date for the project.
Conwed Finish Line
Installation
Once the project is shipped, it arrives on-site to be installed. We don't install but we can point you in the direction of some qualified installers. Conwed has install guides available for our products & can also provide installation support.
Conwed Rep Finish Line
Shop drawings
Custom engineering
Layout
Field dimensions
Final quote created
Most recent architectural pdf drawings
Purchasing & production
Materials are paid for and ordered
Project ship date assigned
Congrats! You made an acoustic solution.
Grab a drink
Celebrate
Send us pictures

We know the acoustics industry (is complicated).

So we made a team specifically to help simplify it for you. No charge.



Glossary

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Metric Sabins ▸ Unit of sound absorption

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Stretch systems ▸ Nam estotaquae non porum, ime nis magnien daest, esto qui invelent eate doluptae officii sciissit, nihita que nus de sam qui restist, sam secesto

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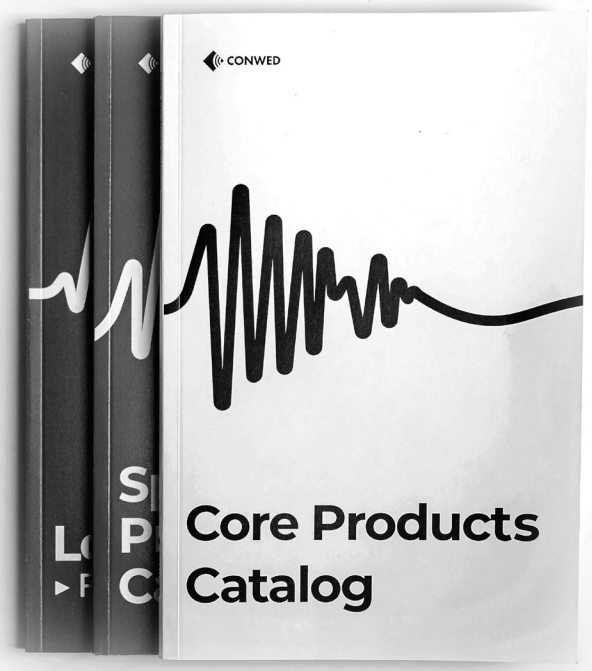

Want to know more about Conwed products and installations?
Check out our catalog series and our portfolio at conwed.com