Subject: Insulation inside of speaker: Spray Foam?
Posted by dutchswan0311 on Thu, 01 Mar 2012 02:41:08 GMT
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Would low pressure flexible polyurethane foam insulation be an appropriate substitute for the fiberglass insulation you recommend be installed inside the 1pi enclosure?

I know, I know...why can't this guy just doing it like the instructions say. Why must he poke the bear all of the time

Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by Wayne Parham on Thu, 01 Mar 2012 04:20:55 GMT
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Nope. That stuff forms a solid, and provides practically no acoustic absorption at all.

It's great for filling dead air spaces, but be careful not to use too much. I've used it in various designs over the years to fill dead air spaces. I also use it to protect the corners of midhorn flat pack kits. I put the panels in a large plastic bag, set them in the cardboard shipping container, then spray in that stuff around the edges. Works great as a foam-in-place shipping filler material. But again, it's not any good for acoustic damping material, not at all.

Stick with R13. Don't go with any of the other stuff people sometimes go on about. Just get a few rolls or R13 and get after it. You'll have itchy arms for a day, but it'll go away. The speakers will perform better with the R13 than anything else you can find.

Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by dutchswan0311 on Thu, 01 Mar 2012 04:32:47 GMT
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I understand...use R13.

Your explanation does raise another question. We are having the 6" walls and rafters of the winery insulated with polyurethane spray foam. Each of the contractors told us the open cell spray foam is an excellent sound barrier to help keep loud music or movies inside the building so as to not irritate the neighbors. By your explanation, their thinking is flawed?

Subject: Re: Insulation inside of speaker: Spray Foam?

Posted by Wayne Parham on Thu, 01 Mar 2012 05:42:04 GMT
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We're talking about three different things here.

First, R13 is a fiberous material, not an open cell or closed cell foam. It's best at midrange and high frequency attenuation, which is exactly what we want for damping inside loudspeakers.

Second, open cell foam is kind of like the foam used for grille materials. Sound passes through it, but it forms a mesh of fibers when the cell walls break, hence the name "open cell". So it does attenuate sound, especially when thick.

Third, closed cell foam (like what's in those cans) is a foam that makes little bubbles that never pop. The surface is essentially solid, sort of like rubber. It's acoustically reflective, and won't absorb much at all. It can be used as the damping layer of a constrained layer panel, but by itself, it reflects much more than it absorbs.

I'd characterize fiberglass insulation as acting primarily as an absorber of sound, and almost completely ineffective as a reflector or barrier of sound. Closed cell foam is just the opposite, mostly a reflector/barrier but not very absorbent. Open cell foam is somewhere in between.

One thing to keep in mind is the insulation in walls is there to provide both a sound barrier and a thermal barrier. So there is more to consider than just acoustics. Even so, from an acoustics standpoint, the walls and the insulation are both barrier (reflector) and damper (absorber). Some of the goals are the same or at least similar, but some are very different.
Understanding Damping Techniques for Noise and Vibration Control

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Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by LevelFive on Tue, 09 Apr 2013 15:15:21 GMT
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Hi, Friends

I have idea using another insulation material: Hollow Fiber. Too is a fiberous material.
Can found inside the pillows.

Hollow fibers are polymeric fibers that have a continuous hole running down the middle; the hole is created by the introduction of air or other gas (nitrogen) in the polymeric solution (in wet spinningprocess) or by melt spinning through speciallydesigned spinnerets.

Such structure would have air inside its lumen which increases the air volume in the fabric and, in turn, increases its ability to absorb sound waves rather than reflecting it.

What do you mean about this?
At least looks as more healthcare material without sound quality decreasing

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Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by Wayne Parham on Tue, 09 Apr 2013 16:00:47 GMT
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I don't think it will work as well. If you have a specific material you want to try, you could certainly test it to be sure. But I have found poly fibers I tested to be pretty ineffective. Same with organics like cotton. Both seem to act more like a solid mass, less like a damper.

I also think in terms of health, fiberglass insulation is often maligned unreasonably. This is probably because it looks similar to asbestos, which is harmful. But fiberglass is not, it is completely benign, and is probably the safest stuff you can use.

I mean, I know it is irritating to install it, because it makes you itch. But it is only irritating when it is disturbed, when your skin brushes against it. Once it is installed, it settles does and does not give off fibers into the environment. Sound energy isn't enough to break the fibers loose, so they do not enter the air.

Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by LevelFive on Tue, 09 Apr 2013 16:11:04 GMT
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Ok. Thanks for answer!
I knew that you've probably already tried...

Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by dheflin44 on Tue, 09 Apr 2013 23:30:28 GMT
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Wayne,

What stuffing method do you recommend for subs (sealed and ported)? If the walls are to be lined with fiberglass, does 1" rigid fiberglass work as well as R13?

Thanks,
Darrell

Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by Wayne Parham on Wed, 10 Apr 2013 00:23:44 GMT
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I don't recommend insulation for subs, although there's no harm installing it. It's just that if the subs aren't sent any content at frequencies where internal standing waves can develop, there's no need for damping material.

Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by dheflin44 on Wed, 10 Apr 2013 00:51:19 GMT
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What about stuffing the middle of a sealed sub cabinet to lower Q? Is fiberglass the best material for this?

Subject: Re: Insulation inside of speaker: Spray Foam?
Posted by Wayne Parham on Wed, 10 Apr 2013 01:49:06 GMT
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dheflin44 wrote on Tue, 09 April 2013 19:51What about stuffing the middle of a sealed sub cabinet to lower Q? Is fiberglass the best material for this?
That's an often suggested method of increasing effective volume. I don't see any harm in doing that at all. Not sure I'd depend on the "increase" as much as just making the box bigger, but if you're basically going for an overdamped alignment like something towards infinite baffle, I'd probably go for it. Can't hurt, especially if you'd really rather have a little bigger box anyway, but can't for space constraints. And yes, I think fiberglass would be the best stuff to use.
