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