Subject: anything lighter then MDF?
Posted by massappeal85 on Wed, 12 Mar 2003 21:32:43 GMT
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I'm curious when it concerns any of the larger speakers, is there a material out there suitable to build enclosures that is LIGHTER then MDF?

Subject: Re: anything lighter then MDF?
Posted by BillEpstein on Wed, 12 Mar 2003 22:27:15 GMT
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Sure! Baltic, Russian or Finnish Birch. Expensive compared to regular ply or MDF. Worth it! REally excellent void free stuff. The laminations are so tight the exposed edges look good enough to finish without edge-banding.Try to find a cabinetmaker that will order some for you. Enough 5X5 sheets to build the big Theatre cabs should run about $120 dollars.

Subject: Re: anything lighter then MDF?
Posted by bmar on Thu, 13 Mar 2003 17:46:36 GMT
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There is also an MDF ultra light that weighs 25% less than regular MDF. I have not used any though. I dont see the point of suffering through the use of MDF over a good ply if you are not going to get the density out of it.Bill

Subject: Re: anything lighter then MDF?
Posted by massappeal85 on Thu, 13 Mar 2003 18:08:24 GMT
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Is there any difference between birch ply and and normal ply that makes it better for speakers if I have no use for the laminate? Is the normal ply cheaper then the birch?

Subject: Plywood and engineered wood 101
Posted by BillEpstein on Fri, 14 Mar 2003 01:37:00 GMT
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There are so many types and constructions of sheet goods, but here are a few generalities:Plywood is cabinet or lumber yard grade but both are industry graded like this, A)Perfect knot free B) Some small tight knots C) Loose knots that can are filled (footballs) D) Loose knots and other imperfections not filledLumberyard plywood is usually B-C, one side B, the other, C. Made from Pine or Spruce. The problem with it for speakers is that the inner plies can be C and D with loose knots and voids from those knots that rattle when they vibrate (play music). And the voids can telegraph through the veneer you apply. And, the footballs can come loose and ruin the finish and sound. Footballs are those oblong, hence football shaped fillers in the C face.This is why at the lower price point MDF is king. But MDF is heavy. And it rings. But it machines and veneers beautifully. This is why MDF is used in so many, including the finest, speakers: price. And so the makers try to convince you that it sounds better. BULLSHIT!!!Cabinet grade, A-A or A-B properly braced Baltic Birch should be and is the material of choice.No voids, no filler footballs and 11 or 13 plies of wonderful Birch, a true hardwood.It's lighter, stronger, more resistant to edge damage and veneers well. And it's almost as dimensionally stable as MDF. And it resonates at different freqs than MDF. Holds screws better, too.But it's expensive and isn't on Home Depot's shelves.Now, if you want to use lumberyard plywood, and lot's of good speakers have been built from it, drive by Lowe's and Home Depot, wave and head on into your independent lumberyard. Their B-C plywood will be better than the "big box" stuff and just a few dollars a sheet more. Or don't buy it and go on to the next yard. They will also have iron-on edge banding to hide the edge plies. Or you can paint.Can't wait to see pix of the speakers you build.

Subject: is it ask Bill and Till time yet?
Posted by gonefishin on Sat, 15 Mar 2003 18:06:47 GMT
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Hi there. I was wondering if you would have any suggestions for those of us that are using mdf. Such as tricks to use during construction...and tips for bracing and damping a box made from mdf. Do any of these construction techniques change when using the Baltic ply? or damping techniques. I'm actually getting close to being done with my speakers :) So it may be too late for many of the suggestions you may have...but I would still love to hear them. I've looked thru the archives...and I have found some discussion concerning mdf (and ply)...but nothing that really deals with differences that you may encounter when using one material over the other...including possible bracing or damping both cabinets...made of the two materials.The cabinets I'm building right now are made with 3/4" HDF and 3/4" veneered mdf sandwiched with glue...giving me a 1 1/2" total. Any suggestions what to use on the inside? Should I just use fiberglass? I also have some of that quiet-kote spray...but I've heard you must be careful using this with some adhesives found in speaker surrounds...I'm not sure...but I certainly don't want to take any chances.Below is a link to a little thread I started that shows my SLOOOOOW speaker building process. Also note...this is my first speaker project...so all suggestions are welcome.Thanks for your time!!!!!!!I'll see you guys at Lima :)take care>>>>>>>> enjoy the music!

Subject: Re: Sure, why not!
Posted by bmar on Sun, 16 Mar 2003 14:19:39 GMT
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A few thoughts on MDF and laminated plywood. Baltic Birch and Apple Ply are some of the best in the business. They can have up to 13 or 15 layers in a 3/4" thickness. This is far denser than a standard 5 or 7 layer ply. It offers improved strength and stability. These plywoods are the best choice for speaker cabinets that will have to be moved around, cabinets that are very large and have to be moved at all, or the need for durability is an issue. Good quality birch plys can also be used as a final product where MDF should never be the final product.MDF is "The" premier substrate for veneer work. The material is ultra stable except in the presence of water. It has very high compression strength. It is cost efficient and easy to machine. Some of the reasons I truly dislike MDF are. It has no structural integrity. It produces huge amounts of dust when worked. Full sheets can be difficult to work with because of the weight. As Till mentioned there is not a difference in sound between MDF and plywood but how the material is excited to resonate at different frequencies. This is true to all woods and can be seen when using different wood for sound boards in acoustical instrument construction. In loudspeaker construction the overtones from box resonation varies significantly from where bracing is used through out the internal structure. MDF and plywood need to be braced differently or the overtones from resonation will not be the same. I call this "box affect" and it is similar to room mode. To briefly summate these characteristics. Unless you move your worldly possessions into an anechoic chamber and build loudspeaker boxes from 10" concrete on six sides. You will always have box affect and room modes. It is possible to use room treatments or open baffle speakers. I submit that this does not remove or "fix" these sound effects but merely changes them to an artifact which is unfamiliar and we can now assume a change for the better. Where does this leave us with our construction? We have already decided on the material to use based on cost, ease of use, strength, weight and other properties. This is a "rule of thumb" I use for building cabinets with these two materials. Braces for MDF are used every 275 square inches of panel.Braces for Baltic or Apple ply are used every 200 square inches of panel.Braces for common 5 and 7 ply are used every 150 square inches of panel.With the use of an Accelerometer and a FFT Spectrum Analyzer, you could dial these figures into a lot more usable data. For common practice and practicality I have come up with those figures because they work best. Each box will always react differently as its shape changes using the same volume, and the shape of the panel itself and where it will be divided play an equal part as well. Wayne has pointed out that with bracing your main intention is to divide the panel into a small panel that will not be excited to resonation at a lower frequency. At higher frequencies the resonation can then be absorbed by the damping material inside the box. I used the same damping material in both plywood and MDF boxes. 3 1/2" fiberglass is suitable and easy to obtain. 3 1/2" fiberglass insulation has an approximate NRC (noise reduction coefficient) of .75 I prefer to use higher density fiberglass such as duct liner or commercial insulations. These have an NRC of .70 at only 1" thickness. The material now becomes more manageable for both use, and storage. It should also be mentioned that fiberglass has a typical NRC of .10 @ 125hz and 1.00 @ 4000hz. This is true to form that the damping material is doing virtually nothing from

20hz to 150hz. This is why the bracing is most important to aid in the control of panel resonations. Construction with MDF can be challenging at times. It WILL split from a edge driven screw and can split or at least expand from edge driven nails. So you might think this is not a problem because "all quality craftsmanship" is constructed with out the use of fasteners. There is some truth to that statement but the problem is MDF does not lend itself to being a part of that phrase! So you have to use fasteners. MDF does not soak up the glue. Yes it absorbs water like a sponge, but the material is so hard and does not have open pores like hard wood and plywood. The glue you use if left to only adhear to the surface of the MDF. At this point your glue joint is as expected, stronger than the material itself. Remember now, MDF has no strength. The glue joint tears of from the rest of the panel taking with it only the very surface to which it was bonded. For all intents and purpose you are gluing together paper. Screws are best and should have two holes drilled. A body hole through the top board that the screw will fall straight through. A pilot hole into the edge of the fastened panel that is of the same diameter as the "core" of the screw. Hold a drill bit along the screw and the threads of the screw should be all that projects beyond the diameter of the drill. Stay at least 2" away from corners with fasteners. Nails can be used and a 2" nail is good for 3/4" MDF. Coated nails are better and Nail guns are best.Dados, Rabbets and variations of good joinery all have added strength for solid wood and quality plywood. Using these joinery techniques for MDF for anything other than alignment is not worth the time you spend. For MDF a butt joint is fine. When putting the pieces together. It is best assemble with the edge board slightly proud of its corresponding face board. This will accomplish two things. The first being MDF is subject to swell and expansion when the fastener is installed. By having the face recessed 1/32" you have compensated for this and the swell will now become flush after fastened. The second thing is that you will be covering the MDF with veneer or some form of shell. All the sides will need to be perfectly flat and having a 3/4" recess or drop off at the edge means that you have to take down the whole face to meet the edge which is lower. It is MUCH easier to take down the 3/4" edge a tiny amount than the whole face. Bracing material can be almost anything. Plywood, MDF, hardwood or large dowel rod can all be used with success. Hardwood is tops on the list because it will be easiest to fasten to in the small cross sectional area of the end of the bracing. I use MDF quite frequently because of availability from waste material from the sheets. It has no strength but remember we are only dividing panels to reduced low frequency resonance and excitement. I like to make a brace into a L shape using a 2" strip and a 3" strip. Glue and nail these together in long sections 3, 4, or 5 foot long. Then cut to length the braces you need. Tie a side to side brace to a front to back brace. The world is into uni-body construction so why not loudspeaker boxes. Space your bracing accordingly and always space the bracing unevenly. As an example, if you are building a tall tower type speaker. You would typically have two braces dividing the cabinet's height. This will give you 3 areas. If you tap your knuckle in the 3 areas you want the Bottom, Middle and Top to all have a different tone. A different tone is spreading the easily excitable resonances out into three different frequency groups. If the divisions are all the same, you will end up with that one resonance times 3! This is much like adding multiple speaker motors to gain efficiency.Have fun BuildingBill

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Subject: That concludes our Seminar, any questions?
Posted by BillEpstein on Sun, 16 Mar 2003 16:12:10 GMT

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Subject: :) not at this time teach...thanks guys - nt
Posted by gonefishin on Mon, 17 Mar 2003 18:31:36 GMT

nt enjoy the music!

click here to see my system