Subject: Amorphous metal diaphragms
Posted by Wayne Parham on Sun, 04 Jul 2004 07:25:00 GMT
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Does anyone know if a compression driver has been built with an amorphous metal diaphragm? Seems like it would be a perfect application. I would expect certain amorphous alloys would be better than standard titanium or beryllium for this purpose.
Amorphous metals

Subject: Re: Amorphous metal diaphragms
Posted by wunhuanglo on Mon, 05 Jul 2004 09:40:27 GMT
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Hi WayneSomebody's thought about it in a general way- can't be too far offbase an idea.**********S. Chen and R. E. White, "A Mathematical Model for theElectrodeposition of Amorphous Alloys on a Rotating Disk Electrode,"Proceedings of the Symposium on Electro-deposition Technology: Theoryand Practice, L. T. Romankiw and D. R. Turner, Eds., TheElectrochemical Society, Inc., Pennington, NJ, 1987**********And, conceptually at least, the subject has be broached [thosediamond diaphragm tweeters are another example I guess]Sony MDR-V900 Studio Monitor Stereo HeadphonesFrequency response: 5 - 30000 HzDesigned and engineered for most high end applications.Circum-Aural ear cup design.Larger, Aura-Nomic design 50-mm driver unit.Powerful neodymium magnets.Oxygen-free copper voice coil.****Amorphous diamond evaporated diaphragm.****Folding design; case supplied.Reversible ear cups for single-side monitoring.Cushioned headband.Concealed, single-sided LC-OFC Class 1 coiled cord.Gold-plated stereo Unimatch Plug.Cord length 9.8'.3000 mW super high power handling capacity.10.6 oz without cord.**********An experiment that seems to say you could make planar-magneticspeakers with amorphous materialsThe 1994 IEEE Workshop on Micro-Electro-MechanicalSystemsOiso, Japan, 25-28 Jan 94In one paper, T. Honda of Tohoku University proposedthe use of magnetostrictive materials formicroactuators which are driven by electromagneticforce in order to achieve the large deflection incantilever actuator motion. The paper showed that whenthe thin film is fabricated with Amorphous-Tb-Fe or Sm-Fe, cantilever actuators exhibited the large deflectionunder low magnetic fields, indicating the evidence ofachieving large enough electromagnetic force which mayincrease the future consideration of using theelectromagnetic force for micro-machine applications.**********

Subject: Re: Amorphous metal diaphragms
Posted by Wayne Parham on Mon, 05 Jul 2004 10:36:49 GMT
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Thanks, Charlie, that's very interesting material.I wonder if there would be any advantages using a very thin sheet for a compression driver diaphragm. Then again, it's not just the material that would need to be experimented with, but also the shape of the diaphragm. I think there would still be breakup modes in the audio range, so it would be a matter of tuning them. That would mean material and shape would both come into play.It would be interesting to check into.
