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**Autor(en) des Beitrags:** Russer, J.; Xiong, Y.; Russer, P.  
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**Abstract:** Organic materials allow to adjust the area resistance of conductive layers for optimum broad-band design. Three-dimensional metamaterials based on stacked fishnet structures can be realized by spray coating using carbon nanotube (CNT) pigment inks. The use of lossy thin films enhances the bandwidth of negative refractive index for fishnet structures and the ability to tune the sheet resistance allows for an increased flexibility in the design of metamaterial structures. A lumped element equivalent circuit model of a fishnet metamaterial cell is presented and numerical studies are pursued in this contribution to investigate fishnet metamaterial using nano pigment inks.  
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