

Invisible Shield for Electromagnetic Interference

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Scientists from **Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru, an autonomous institute of the Department of Science & Technology**, Govt. of India have fabricated the transparent and flexible EMI shields made of metal meshes using the crack templating method via spray coating which is pioneered in their laboratory.

Invisible Shield

Scientists have achieved a feat by designing a **metal mesh structure instead of continuous film on desired transparent substrates to make it a transparent shield** for electromagnetic interference (EMI). The invisible shield can be used in various **military stealth applications and can cover electromagnetic wave emitter or absorber devices without compromising their aesthetics**. The CeNS team has developed a **copper metal mesh on polyethylene terephthalate (PET) sheet as its substrate**, which exhibits a visible transmittance (T), a parameter of visible transparency of about 85%.

These **transparent and flexible** EMI shields made of metal mesh coatings on desired transparent substrate they have developed through their research published in the **journal 'Bulletin of Materials Science'** showed remarkably high values for total EMI shielding (SET), with the average value being ~ 41 dB over a wide spectral range of the Ku band (12 to 18 GHz).

Instead of continuous film of metal (Cu) coating on any transparent substrate (glass, PET) where transparency can be compromised. In this method, the CeNS team has deposited metal mesh networks on the substrate, which covers only 7% area of the substrate, unlike 100% coverage of continuous film. This makes the metal mesh transparent compared to continuous metal

film. **Metal mesh provides better electromagnetic shielding compared to the same thickness of continuous metal film where transparency can be compromised.** This metal mesh can be created on any desired substrates such as acrylic, polycarbonate, glass, etc. without compromising the conductivity of the electrodes.