

Vorbeck Vor-coat™ coatings are a line of graphene-based EMI shielding products. Vor-coat coatings are designed to work with conventional industrial coating, painting, and spraying processes. They are easily applied to a variety of surfaces and shapes and has excellent flexibility.

Vor-coat harnesses the power of graphene (a sheet of carbon a single atom thick), which has exceptional electrical conductivity, thermal properties, strength, and flexibility. Graphene-based Vor-coat can be applied using standard industrial coating processes to generate thin and very flexible cured coatings .

Vorbeck has extensive experience using graphene sheets to fine tune the electrical properties and mechanical performance of Vor-coat products to meet a wide range of commercial requirements. We have shown that thin coatings of Vor-coat can attenuate electromagnetic transmissions at a broad range of frequencies.

**Vor-coat can be used to shield rigid and flexible substrates and has proven effective in demanding use cases (e.g. medical devices) in which form-factor and environmental constraints has made other solutions infeasible.**

## VOR-COAT PRODUCT SELECTION CHART

Product	Coatings	Painting	Spray	Typical attenuation at 2-18 GHz* (-) dB	Surface resistivity** (ohm/sq/mil)	Curing temperatures (°C)
D101	Y	N	Y	10-25	10	60-200
F101	Y	Y	Y	20-35	5	100-200
S912	Y	Y	N	30-60	1	130-200
CX911	Y	Y	Y	15-50	6-8	r.t.

\*Dependent upon coating thickness and substrate

\*\*When coated on PET film

## VOR-COAT ADVANTAGES

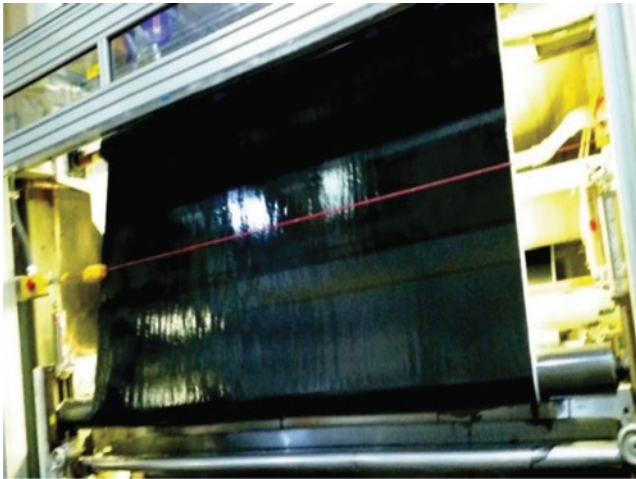
- Cost effective
- Design freedom; conforms to 3D structures
- Usable with standard application methods
- Non-metallic
- Weight reduction relative to metals
- Corrosion resistant
- Thermally and chemically stable
- Excellent flexibility
- Adhesion to a wide variety of substrates
- Flat attenuation between 2 and 18 GHz of up to about -60 dB (depending on coating thickness and substrate)
- Service temperatures: -40 to 180 °C (substrate permitting)

## APPLICATION METHODS

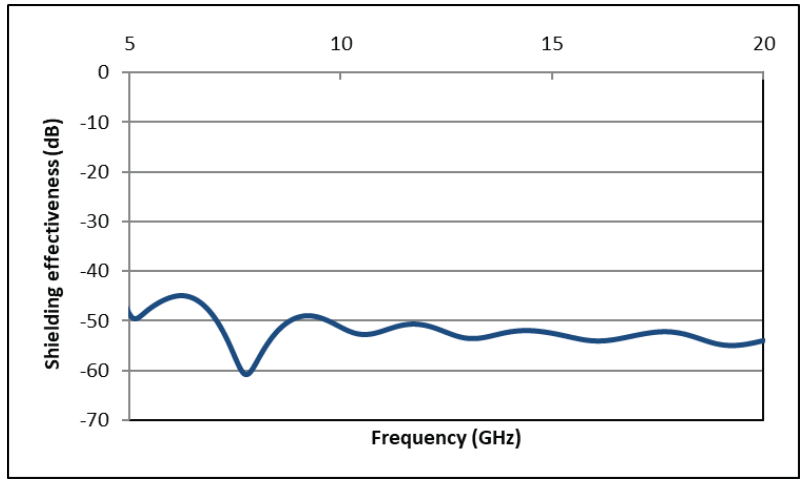
- Industrial coaters
- Roll
- Brush
- Spray gun

## REPRESENTATIVE SUBSTRATES

- Flexible substrates: polymeric films (e.g., PET, polyetherimide (Kapton®), PVC, polyurethanes), fabrics (woven and nonwoven), stickers, paper.
- Rigid materials: FR4, glass, ceramic tiles, silicon, engineering plastics (e.g. nylon, ABS, polyester), building materials (e.g., drywall, wood, concrete)



Vor-coat S912 being slot-die coated onto a flexible substrate



Vor-coat S912 shielding effectiveness between 5 and 20 GHz

