

# EMI shielding solutions from LNP\* Faradex\* compounds

LNP Faradex compounds from SABIC Innovative Plastics can help electronic equipment OEMs improve design and enhance productivity.

These compounds – with the intrinsic ability to attenuate electromagnetic radiation – support OEMs in meeting electromagnetic compatibility (EMC) standards, offer greater design flexibility than formed metal enclosures and provide productivity and environmental advantages over metallized plastic enclosures. Lighter in weight with better corrosion resistance than metal, LNP Faradex compounds have the toughness and UL 94 flammability rating resistance for use in a variety of electronic enclosures.

### LNP Faradex compounds product line

- Thermoplastics resin + 1.0 to 2.0% volume % stainless steel fiber
- Fully compounded, pre-colored granules, available in a wide variety of base resins including: ABS, PC/ABS, PC, PP
- Flame retardant grades available

### Key product features

- Intrinsic EMI attenuation of up to 65dB†
- Colorability††
- Isotropic shrinkage properties
- Density increases of only 5 to 10% over base resin
- Practical toughness and ductility
- Mechanicals (w/o impact) similar to base resin
- Processing characteristics similar to base resin

† Testing conducted to ASTM D4935 on 3mm thick plaques over a frequency range of 30MHz to 1.5GHz.

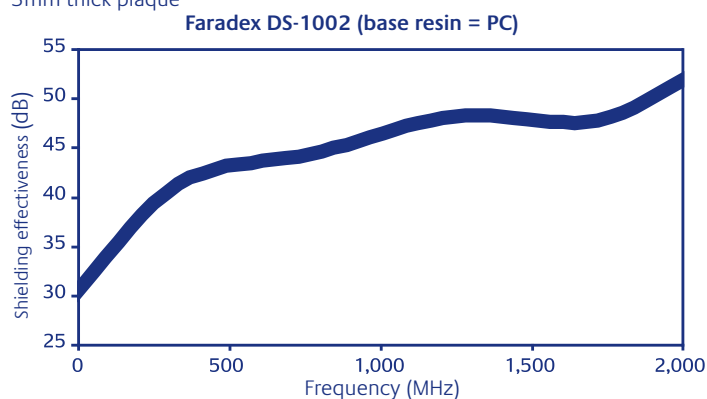
†† While a wide range of colors are available, the stainless steel filler will show through on lighter colors. Darker colors and texturing can minimize this “read” through effect.

### Enclosure shielding methods: comparative performance factors

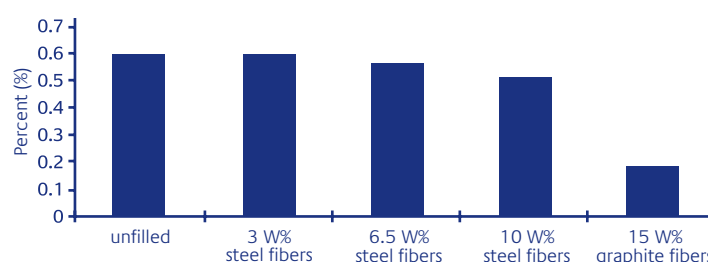
Bulk shielding method	Weight reduction	Relative cost	Shielding effectiveness	Recyclability	Waste generation	Design flexibility	Comments
<b>Conductive compounds</b> (LNP Faradex compounds)	●	○	○	○	●	●	Design sensitive. Limited shielding ability around apertures and joints. Part thickness dependent.
<b>Plating methods</b> (Electroless and electro-plating)	●	○	○	○	○	○	Masking limitations, waste disposal, EHS issues. Tooling & fixture costs.
<b>Conductive spray coats</b> (Paints, zinc arc)	●	○	○	○	○	○	Masking limitations, adhesion to plastics.
<b>Metalization</b> (Vacuum, cathode sputtering)	●	○	○	○	○	○	Tooling, fixtures, masking limitations, EHS, waste disposal.
<b>Metal enclosures</b> (Die cast, foils, stamped sheet metal)	○	●	●	●	●	○	Weight, size and lack of design flexibility for complex geometries.

Most positive ● Moderate ○ Most negative ○

### Shielding effectiveness (SE): LNP Faradex DS-1002 per ASTM D4935 on 3mm thick plaque



### Shrinkage comparison: LNP Faradex compounds vs. standard resins



# LNP\* Faradex\* compounds

**Application:** Asset tracking device housing

**Product:** LNP Faradex DS-1003 FR HI black

**Outcome:** More cost-efficient, environmentally compatible enclosure which meets FCC part 15 class B emissions limits, UL flammability and OEM toughness and durability requirements.

**Material replaced:** Flame retardant polycarbonate (PC) with nickel/copper metalization



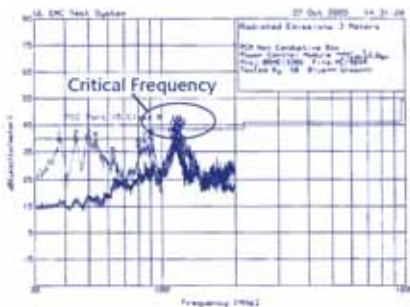
FR PC with nickel/copper metalization



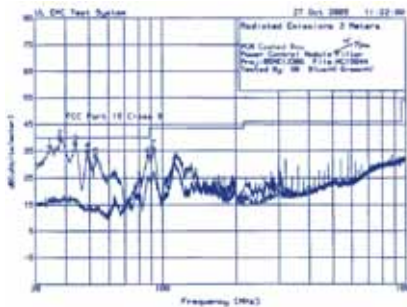
LNP Faradex DS-1003 FR HI

## Asset tracking device: emissions charts

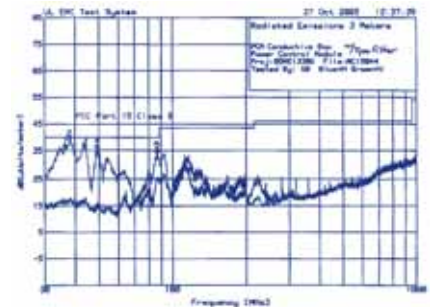
### 1. Power supply with no shielding – baseline information



### 2. Power supply with shielding – nickel/copper spray metalization



### 3. Power supply with shielding – LNP Faradex compound



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