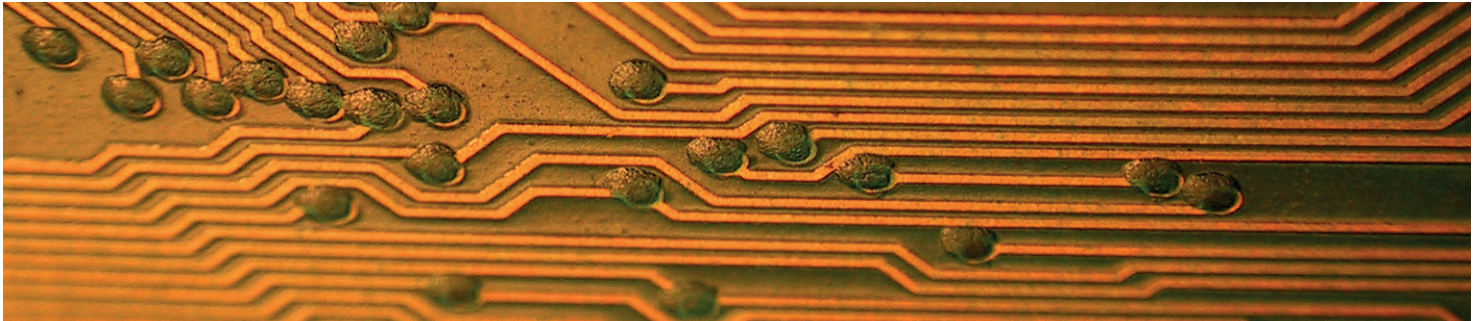




# PPG Electronic Materials (Spraylat) Conductive Coatings



Pexa has been the authorised distributor for Spraylat Conductive Coatings for over 10 years. Recently acquired by PPG, Spraylat manufactures a complete range of conductive coatings for EM and RF shielding, electrostatic discharge and lightning protection.

Conductive formulations based on silver and copper and hybrids of the two permit a range of properties to be delivered offering tailor made conductivity and cost per unit coated. Pexa is fully capable of delivering a complete package of product recommendation and application support.

## Applications

Electronics enclosures made from plastic have no natural conductivity. They can be coated with conductive coatings to form a shield to EM/RF interference or to conduct current for other purposes. Typical applications include telecoms equipment, bar code readers, in car entertainment systems, cash machines, PCs, medical equipment & avionics.

## Key Products

**Safe-on-Substrate 599B-series.** These products are based on mild, alcohol solvents which are compatible with most plastics without causing cracking or other damage.

**599Z-series.** These products are water based, offering similar properties to the SoS 599B-series but with the additional advantage of lower VOC emissions.

## Performance

**RoHS.** All products are tested and certified for compliance with the EU directive 95/2002 on the disposal of end of life equipment. The products are certified free from – Lead, Mercury, Cadmium, Hexavalent Chromium, Polybrominated biphenyls and Polybrominated diphenyl ether.

**Electrical Conductivity/Resistivity.** This is measured in Ohms either as Ohms/square using a square test probe or “point to point” using two probes placed a set distance apart. The PPG Electronic Materials products offer excellent characteristics in both regards with conductivity manageable down to less than 0.01 Ohms.

**EM/RF Shielding.** This is the capability of the coating to attenuate electromagnetic radiation from one side of the coating to the other. This allows plastic enclosures to perform as well as metal ones in shielding performance. Attenuation between 71 – 90 dB can be managed depending on the frequency.

## Underwriters' Laboratory

Underwriter's Laboratory (UL) is an independent product testing organisation; it offers more than 1000 standards for safety. UL certification is frequently required as part of product certification. Products are approved in a combination of substrate and coating, PPG Electronic Materials products are UL qualified on a wide range of substrates.



**Pexa Ltd**  
Burwood Way  
Holywell Green  
West Yorkshire HX4 9BH, UK  
T: +44 (0) 1422 314400  
F: +44 (0) 1422 314401  
E: info@pexa.com  
www.pexa.com



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## Key Performance and Specification Data

| Selection of Typical Products in Range        |             |   |
|---|-------------|---|
| Product Code                                  | Composition | Typical Range of Film Thickness microns ( $\mu$ ) |
| <b>Spraylat 599B Safe-on-Substrate Series</b> |             |   |
| 599B3755                                      | Copper      | 12.5-25.0   |
| 599B3740                                      | Hybrid      | 7.5-17.5  |
| 599B3730                                      | Silver      | 5.0-12.5  |
| <b>Spraylat 599Z Series</b>                   |             |   |
| 559Z6261                                      | Copper      | 12.5-37.5   |
| 559Z6103                                      | Hybrid      | 12.5-25.0   |
| 559Z6098                                      | Silver      | 12.5-15.0   |

| Selection of Typical Products in Range |               |              |   |                                 |
|--|---------------|--------------|---|---------------------------------|
| Product Code                           | Type          | Pigmentation | Typical layer thickness for optimal performance ( $\mu$ ) | Typical resistivity Ohms/square |
| 599B3755                               | Solvent based | Copper       | 12.5 - 25.0   | 0.01 - 0.018                    |
| 599B3740                               | Solvent based | Hybrid       | 7.5 - 17.5  | 0.006 - 0.008                   |
| 599B3730                               | Solvent based | Silver       | 5.0 - 12.5  | 0.002 - 0.003                   |
| 599Z6103                               | Water based   | Copper       | 12.5 - 25.0   | 0.015 - 0.02                    |
| 599Z6098                               | Water based   | Hybrid       | 12.5 - 25.0   | 0.01 - 0.014                    |
| 599Z3000                               | Water based   | Silver       | 12.5 - 25.0   | 0.02 - 0.03                     |

### Point to point Spraylat 599B Safe-on-Substrate series representative results

|                        | Copper        |               | Hybrid       |               | Silver       |               | milli-O hms $m\Omega$ |
|------------------------|---------------|---------------|--------------|---------------|--------------|---------------|-----------------------|
|                        | mid-distance  | corner-corner | mid-distance | corner-corner | mid-distance | corner-corner |                       |
| Mobile phone housing 1 | .180 to 0.200 | .200 to .240  | .09 to .110  | .120 to .140  | .080 to .100 | .100 to .120  |                       |
| Mobile phone housing 2 | .100 to .130  | .170 to .200  | .110 to .130 | .160 to .200  | .100 to .120 | .120 to .160  |                       |

Spraylat 599Z water based series offers similar performance

### Ohms per square results

| Product  | 0.01   | 0.02   | 0.03   |
|----------|--------|--------|--------|
| 599B3730 | Shaded |        |        |
| 599B3740 |        | Shaded |        |
| 599B3755 |        | Shaded |        |
| 599Z6098 |        | Shaded |        |
| 599Z6103 |        |        | Shaded |
| 599Z6261 |        |        | Shaded |

Shaded bar represents a range of results

### EMI Shielding Properties

#### Co-Axial Transmission Line Test ASTM D4935-89

#### Spraylat 599B Safe-on-Substrate Series results

| MhZ  | Copper 20 $\mu$ | Hybrid 15 $\mu$ | Silver 17.5 $\mu$ | dB |
|------|-----------------|-----------------|-------------------|----|
| 30   | 90              | 74              | 90                |    |
| 50   | 88              | 74              | 92                |    |
| 100  | 85              | 78              | 92                |    |
| 300  | 78              | 73              | 78                |    |
| 500  | 80              | 72              | 78                |    |
| 700  | 79              | 72              | 78                |    |
| 1000 | 78              | 71              | 86                |    |
| 1500 | 77              | 71              | 86                |    |

Testing to Mil Std 285 yields similar results

### Snapshot selection of UL Certifications

| Product  | Plastic Substrate             |
|----------|-------------------------------|
| 599B3314 | GE Plastics Cycology variants |
| 599B3314 | Bayer Bayblend variants       |
| 599B3314 | Asahi VA variants             |
| 599B3755 | Mitsubishi Eng. MB variants   |
| 599B3755 | Teijin Multilon               |
| 599Z6103 | GE Lexan variants             |
| 599Z6103 | Bayer FR variants             |



Pexa is a supplier of high technology materials to the aerospace, defence, electronics and energy industries. We are trusted partners of brand leading industrial product manufacturers; we employ progressive supply chain systems to deliver our promises. Our mission is to assist our customers to meet their own business objectives using our products and services; these products include surface finishing materials, aircraft maintenance products, application equipment and unique packaging solutions.

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