

PRE-ELEC[®] ELECTRICALLY CONDUCTIVE PLASTICS

We introduced our first conductive compound in 1983 among the first companies in the world. Today PRE-ELEC[®] product family covers wide areas of the conductivity spectrum and a large selection of base polymers. Our compounds and concentrates can be used in electrostatic discharge (ESD), explosive atmospheres (Ex/ATEX), and metal replacement applications.



Properties of PRE-ELEC® compounds and concentrates (typical values)

| Polymer Base | Product name | Applications | Compound | Concentrate | Extrusion | Injection moulding | Volume resistivity (Ωcm) | Surface resistance (Ω) | Melt flow rate (g/10min) | Specific gravity (g/cm ³) | Flexural modulus (MPa) | Hardness (Sh D) |
|--------------|-----------------------|--------------------------------------|----------|-------------|-----------|--------------------|--------------------------|------------------------|--------------------------|---------------------------------------|------------------------|-----------------|
| ABS | PRE-ELEC® ABS 1410 | Technical Parts | • | | | • | 350 | 5E+3 | 220°C / 10.0 kg: 15 | 1.10 | 2000 | 76 |
| ABS | PRE-ELEC® ABS 1415 | Technical Parts | • | | • | | 300 | out of range | 220°C / 10.0 kg: 2.5 | 1.10 | 1900 | 77 |
| EVA | PRE-ELEC® CP 1515 | Foams | • | | • | | 250 | 5E+3 | 190°C / 5.0 kg: 1.2 | 1.06 | 110 | 47 |
| PA-6 | PRE-ELEC® PA 1406 | Technical Parts (carbon fiber) | • | | | • | >5000 | 4E+5 | 275°C / 10.0kg: 46 | 1.14 | 6500 | 81 |
| PA-6 | PRE-ELEC® PA 1408 | Technical Parts | • | | | • | 700 | 2E+3 | 275°C / 10.0kg: 5.0 | 1.20 | 2000 | 80 |
| PA-6 | PRE-ELEC® PA 1411 | Technical Parts | | • | ◦ | • | 35 (a) | 9E+2 (a) | 275°C / 10.0kg: 6.6 | 1.25 | 3200 (a) | 84 (a) |
| PA-6 | PRE-ELEC® PA 17970 | Technical Parts (glass fiber) | • | | | • | >5000 | 2E+4 | 275°C / 10.0kg: 13 | 1.36 | 6700 | - |
| PBT | PRE-ELEC® PBT 1455 | Technical Parts | • | | | • | 100 | 3E+3 | 240°C / 10.0 kg: 14 | 1.32 | 2000 | 84 |
| PC | PRE-ELEC® PC 1431 | Technical Parts | • | | | • | >5000 | 4E+4 | 240°C / 2.16 kg: 10 | 1.24 | 2500 | 85 |
| PC/ABS | PRE-ELEC® PC/ABS 1420 | Sheets | • | | • | | 150 | 6E+3 | 240°C / 21.6 kg: 13 | 1.12 | 2700 | 78 |
| PE-HD | PRE-ELEC® PE 1250 | Sheets, Pipes | | • | • | ◦ | 2 (b) | 4E+2 (b) | 190°C / 21.6 kg: 1.6 | 1.02 | 1100 (b) | 65 (b) |
| PE-HD | PRE-ELEC® PE 1291 | Sheets, Pipes, Cans & Bins | • | | • | | 50 | 9E+2 | 190°C / 21.6 kg: 6.0 | 1.04 | 1200 | 71 |
| PE-HD | PRE-ELEC® PE 1292 | Sheets, Pipes | • | | • | ◦ | 70 | 2E+3 | 190°C / 21.6 kg: 35 | 1.03 | 1100 | 66 |
| PE-HD | PRE-ELEC® PE 1296 | Sheets, Cans & Bins, Pipes | | • | • | ◦ | 1 (c) | 3E+2 (c) | 190°C / 21.6 kg: 0.6 | 1.12 | 1200 (c) | 65 (c) |
| PE-HD | PRE-ELEC® PE 1312 | Cans & Bins | • | | | | 100 | 4E+3 | 190°C / 21.6 kg: 10 | 1.03 | 1200 | 67 |
| PE-HD | PRE-ELEC® PE 14708GF | Fuel Systems | • | | | • | 25 | 5E+2 | 190°C / 21.6 kg: 17 | 1.24 | 4600 | 65 |
| PE-HD | PRE-ELEC® PE 18594 | Sheets, Boxes & Pallets, Cans & Bins | | • | • | | 1 (d) | 1,2E+6 (d) | 190°C / 21.6 kg: 3.1 | 1.14 | 1375 (d) | 67 (d) |
| PE-HD | PRE-ELEC® PE 18664 | Cables | • | | • | | 20 | 9E+2 | 190°C / 5.0 kg: 1.8 | 1.06 | 1000 | 61 |
| PE-HD | PRE-ELEC® TP 11270 | Fuel Systems | • | | • | • | 50 | 2E+3 | 190°C / 21.6 kg: 15.0 | 1.03 | 1200 | 70 |
| PE-LD | PRE-ELEC® PE 1271 | Films, FIBC | • | | • | | 70 | 5E+3 | 190°C / 5.0 kg: 1.7 | 1.02 | - | 56 |
| PE-LD | PRE-ELEC® PE 18381 | Films, Cables | • | | • | | 14 | 9E+2 | 190°C / 5.0 kg: 0.5 | 1.05 | 170 | 45 |
| PE-LD | PRE-ELEC® PE 18500 | Cables | • | | • | | 20 | 1E+3 | 190°C / 5.0 kg: 4.7 | 1.04 | 200 | 52 |
| PE-LLD | PRE-ELEC® PE 12841 | Flexible Tubes and Profiles, Cables | • | | • | ◦ | 19 | 7E+2 | 190°C / 5.0 kg: 1.0 | 1.05 | 400 | 61 |
| PE-LLD | PRE-ELEC® PE 17840 | Films, Filaments, FIBC, Sheets | | • | • | | 0.7 | out of range | 230°C / 21.6 kg: 4.5 | 1.20 | - | - |
| POE | PRE-ELEC® PE 17693 | Flexible Tubes and Profiles | | • | • | | 1.4 | 4E+2 | 190°C / 21.6 kg: 11.0 | 1.06 | - | 52 |
| POE | PRE-ELEC® PE 18480 | Flexible Tubes and Profiles | • | | • | | 8 | 4E+2 | 190°C / 10.0 kg: 2.2 | 1.05 | 200 | 47 |
| PP-C | PRE-ELEC® PP 1353 | Filaments, FIBC | | • | • | ◦ | 180 (e) | 1E+3 (e) | 230C / 10.0 kg: 9.0 | 1.11 | 1,300 (e) | 75 (e) |
| PP-C | PRE-ELEC® PP 1370 | Boxes & Pallets | • | | | • | 70 | 9E+2 | 230°C / 2.16 kg: 2.0 | 0.98 | 1,200 | 71 |
| PP-C | PRE-ELEC® PP 1375 | Boxes & Pallets | • | | | • | 80 | 4E+3 | 230°C / 2.16 kg: 20.0 | 0.98 | 1,300 | 65 |
| PP-C | PRE-ELEC® PP 1392 | Boxes & Pallets | • | | | • | 60 | 2E+3 | 230°C / 2.16 kg: 7.0 | 0.98 | 1,500 | 72 |
| PP-C | PRE-ELEC® PP 1393 | Sheets | | • | • | ◦ | 4 (f) | 6E+2 (f) | 230°C / 5.0 kg: 0.5 | 1.06 | 1,500 (f) | 71 (f) |
| PP-C | PRE-ELEC® PP 1397 | Sheets, Cables | • | | • | ◦ | 60 | 3E+3 | 230°C / 2.16 kg: 1.2 | 0.98 | 1,400 | 74 |
| PP-C | PRE-ELEC® PP 17147 | EMI shielding | • | | | • | 0.25 | 6E+2 | 230°C / 10.0 kg: 5.3 | 1.14 | 9,000 | 75 |

• Primary processing method ◦ Secondary processing method

| Polymer Base | Product name | Applications | Compound | Concentrate | Extrusion | Injection moulding | Volume resistivity (Ωcm) | Surface resistance (Ω) | Melt flow rate (g/10min) | Specific gravity (g/cm3) | Flexural modulus (MPa) | Hardness (Sh D) |
|--------------|---------------------|--|----------|-------------|-----------|--------------------|--------------------------|------------------------|--------------------------|--------------------------|------------------------|-----------------|
| PP-C | PRE-ELEC@ PP 18220 | Cables | • | | • | | 25 | 1E+3 | 230°C / 10.0 kg: 3.2 | 0.99 | 200 | 51 |
| PP-C | PRE-ELEC@ PP 18900 | Sheets | | • | • | ◦ | 4 (g) | 6E+2 (g) | 230°C / 5.0 kg: 0.5 | 1.06 | 1,500 (g) | 71 (g) |
| PP-C | PRE-ELEC@ PP 18920 | Cables | • | | • | | 1.2 | 3.7E+2 | 230°C / 5.0 kg: 1.2 | 1.12 | 1,400 | 71 |
| PP-C | PRE-ELEC@ PP 18999 | Boxes & Pallets | | • | ◦ | • | 15 | 6E+2 | 230°C / 10.0 kg: 2.7 | 1.03 | 200 | 51 |
| PP-C | PRE-ELEC@ PP 19136 | Boxes, Crates, Technical parts | • | | | • | > 5,000 | 7E+6 | 230C / 5.0 kg: 34 | 1.00 | 1,054 | 65 |
| PP-C | PRE-ELEC@ PP 19161 | Boxes, Crates, Technical parts | • | | | • | 90 | 4E+3 | 230°C / 2.16 kg: 3.4 | 1.02 | 1,200 | 65 |
| PP-C | PRE-ELEC@ PP 19279 | Sheets, Profiles | | • | • | ◦ | 11(h) | 5E+2 (h) | 230°C / 10.0 kg: 1.6 | 1.15 | 1,400(h) | 66(h) |
| PP-H | PRE-ELEC@ PP 15392 | Sheets | | • | • | ◦ | 150 (i) | 8E+3 (i) | 230°C / 10.0 kg: 8 | 1.11 | 1,265 (i) | 70 (i) |
| PP-H | PRE-ELEC@ PP 16156 | Films | • | | • | | 3 | out of range | 230°C / 5.0 kg: 15.0 | 1.03 | - | - |
| PP-H | PRE-ELEC@ PP 18873 | Technical Parts (Flame retardant) | • | | | • | > 5,000 | 7E+8 | 230°C / 2.16 kg: 11 | 1.04 | 1,100 | 64 |
| PP-H | PRE-ELEC@ TP 14815 | Profiles, Sheets (Flame retardant) | • | | • | | 110 | 2E+3 | 230°C / 10.0 kg: 1.3 | 1.42 | 2,000 | 67 |
| PS-HI | PRE-ELEC@ PS 1328 | Cans & Bins | • | | | • | 60 | 1E+3 | 200°C / 5.0 kg: 3.0 | 1.10 | 2,200 | 79 |
| PS-HI | PRE-ELEC@ PS 18014 | Technical Parts | • | | | • | 90 | 4E+3 | 200°C / 5.0 kg: 6.0 | 1.00 | 1,500 | 73 |
| SBC | PRE-ELEC@ TP 15837 | Sheets | | • | • | | 100 (j) | 8E+2 (j) | 200°C / 21.6 kg: 2.3 | 1.17 | 1,650 (j) | 72 (j) |
| TPE-S | PRE-ELEC@ TPE 1502 | Flexible Tubes and Profiles, Cables | • | | • | | 15 | 9E+2 | 190°C / 10.0 kg: 4.0 | 1.08 | - | 65 |
| TPE-S | PRE-ELEC@ TPE 18416 | Flexible Tubes and Profiles, Cables | • | | • | | 3,5 | 4E+2 | 190°C / 21.6 kg: 9.8 | 1.20 | - | 87 |
| TPU-Es | PRE-ELEC@ TP 16159 | Technical Parts | • | | | • | 9 | 2E+4 | 190°C / 10.0 kg: 33.0 | 1.28 | 660 | 62 |
| TPU-Es | PRE-ELEC@ TPU 1512 | Flexible Tubes and Profiles, Sheets, Cables, Technical Parts | • | | • | ◦ | 10 | 8E+2 | 190°C / 10.0 kg: 11.0 | 1.27 | - | 87 |
| TPU-Es | PRE-ELEC@ TPU 18438 | Flexible Tubes and Profiles | • | | • | | 250 | 2E+3 | 190°C / 10.0 kg: 9.0 | 1.27 | - | 84 |
| TPU-Es | PRE-ELEC@ TPU 18600 | Flexible Tubes and Profiles, Cables | • | | • | | 41 | 6E+4 | 190°C / 10.0 kg: 1.0 | 1.28 | - | 87 |
| TPU-Et | PRE-ELEC@ TPU 16619 | Flexible Tubes and Profiles | • | | • | ◦ | 30 | 2E+3 | 190°C / 5.0 kg: 5.0 | 1.21 | - | 88 |
| TPU-Et | PRE-ELEC@ TPU 18025 | Films, Sheets, Cables | • | | • | | < 10 | < 5E+2 | 190°C / 10.0 kg: 2.0 | 1.22 | - | 86 |

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Notes • Primary processing method ◦ Secondary processing method

(a) dilution 30% PA6

(b) dilution 50% HDPE MFI 0.25 (190°C / 5 kg)

(c) dilution 40% HDPE MFI 9 (190°C / 21.6 kg)

(d) dilution 50% HDPE MFI 9 (190°C / 21.6 kg)

(e) dilution 50% PP-H MFI 35 (230°C / 2.16 kg)

(f) dilution 30% PP-C MFI 13 (230°C / 2.16 kg)

(g) dilution 30% PP-C MFI 13 (230°C / 2.16 kg)

(h) dilution 30% PP-C MFI 4 (230°C / 2.16 kg)

(i) dilution 50% PP-C MFI 3.5 (230°C / 2.16 kg)

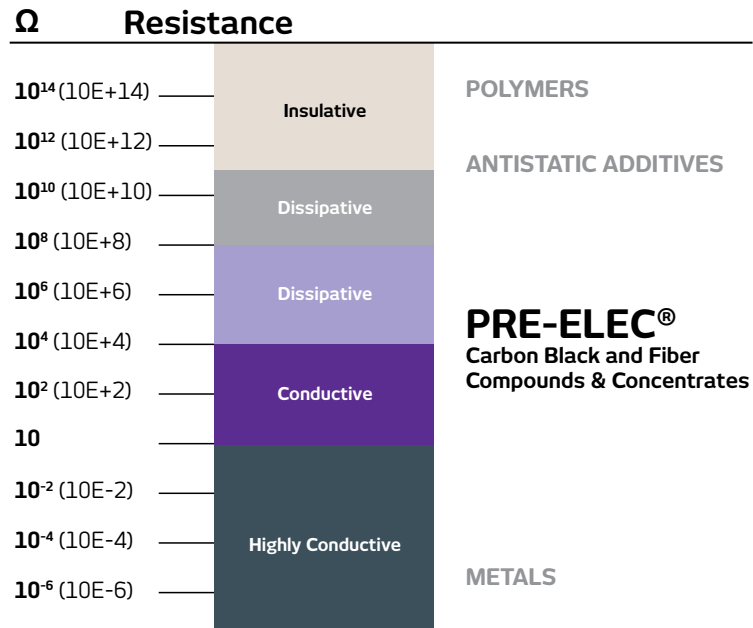
(j) dilution 50% HIPS MFI 4 (200°C / 5 kg)

Surface resistance - how to read: for example, 2E+6 Ω = 2,000,000 Ω

Carbon black concentrates

are an excellent way to reduce the raw material costs. In PRE-ELEC® concentrates, the carbon black content has been optimized to the highest possible level. In sustainable and/or cost-driven applications, regrind or recycled plastics can be used for dilution. Besides the economical advantages concentrates also allow the modification of product properties e.g. stiffness or flame retardancy.

Carbon black has established its position as the most widely used electrically conductive filler. Carbon black offers a superior price-performance ratio and stable properties over time. Typically carbon black compounds' surface resistance range settles between $10^2 \Omega$ and $10^5 \Omega$. Premix's comprehensive product portfolio covers the conductive plastics spectrum.



Boost your business with electrically conductive concentrates

Concentrates help reduce raw material costs. In PRE-ELEC® concentrates, the carbon black content has been optimized to the highest possible level. When striving for maximum cost efficiency, recycled plastics or regrind from your own process can be used to dilute the concentrate. One small yet innovative step can lead to significant cost savings.

Besides the economic advantages, concentrates also allow the modification of product properties. To impart stiffness and strength to the finished product, the reinforced plastic can be used for dilution.

ABOUT PREMIX

With more than 40 years of industry experience, Premix's expertise lies in the formulation and production of functional plastic materials. Premix's materials are more than just traditional plastics – they play an active role in the product or process they are integrated into. Premix was one of the first companies to enter the market for electrically conductive plastics in the early stages, and it is now the world's leading specialist in the area. Today, we are a company that develops future solutions also for antimicrobial materials.

PRE-ELEC® is a registered trademark of Premix Oy.

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