

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/cm3)	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 / 100kg: 46	1.14	6500	81
PA-6	PRE-ELEC® PA 1408	Technical Parts	●			●	700	2E+3	275°C / 100kg: 5.0	1.20	2000	80
PA-6	PRE-ELEC® PA 1411	Technical Parts		●	○	●	35 (a)	9E+2 (a)	275°C / 100kg: 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 (f)	8E+3 (f)	230°C / 10.0 kg: 8	1.11	1.265 (f)	70 (f)
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 (f)	8E+2 (f)	200°C / 2.16 kg: 2.3	1.17	1.650 (f)	72 (f)
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

More information in

Premix Data Center:

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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, reground 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 10² Ω and 10⁵ Ω. Premix's comprehensive product portfolio covers the conductive plastics spectrum.

Ω Resistance	
10 ¹⁴ (10E+14)	Insulative
10 ¹² (10E+12)	
10 ¹⁰ (10E+10)	Dissipative
10 ⁸ (10E+8)	
10 ⁶ (10E+6)	Dissipative
10 ⁴ (10E+4)	
10 ² (10E+2)	Conductive
10	
10 ⁻² (10E-2)	Highly Conductive
10 ⁻⁴ (10E-4)	
10 ⁻⁶ (10E-6)	METALS

PRE-ELEC®
Carbon Black and Fiber
Compounds & Concentrates

	Base polymers	Processing type	After processing	Other information
Compounds	PE, PP, PS, ABS, PC, PC/ABS, PA6, PBT, TPU, TPE	- Extrusion - Injection moulding - Blow moulding	- Foaming - Thermofoaming	
Concentrates	PE-HD, PE-LLD, EVA, PP, PS, PA6	- Extrusion - Injection moulding - Blow moulding	- Foaming - Thermofoaming	Dilution ratio starting from 60% to 40% depending on SR target

PRE-ELEC®
IS AVAILABLE AS

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 reground 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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