Chemours-Mitsui Fluoroproducts Co., Ltd.

Product information

MJ-550 High-Corrosion-Resistance, Antistatic PFA Powder

for Semiconductor and CPI Market

<General information>

PFA coating using MJ-550 is suitable for applications such as Semiconductor manufacturing processes and CPI (Chemical Processing Industry), where high corrosion resistance (substrate protection), antistatic properties, and suppression of metal leaching from the coating film are required. It contributes to extending the service life of the customer's valuable equipment by offering superior corrosion resistance compared with conventional PFA coatings, as well as the excellent heat resistance characteristic of PFA coatings with a continuous operating temperature of up to 260°C. The coating provides conductivity suitable for antistatic applications, enabling continuous control of static charge in equipment exposed to organic solvents and thereby helping to reduce the risk of spark discharge.
MJ-550 is a high-build coating that enables thick film application in fewer coats, reducing processing costs.

<Key benefit>

In addition to the outstanding performance of PFA, the MJ-550 offers further advantages in the following points:

- Superior corrosion resistance
- Excellent antistatic property.
- High purity (metal-free ingredients).
- High-build capability enables thick-film application per coat and sufficient overall thickness for heavy-duty anticorrosive coating.

<Coating system>

Primer: The standard primers such as 420G-706 and PJ-AL902M can be used.
Mid and Topcoat: MJ-550 can be used as both mid and topcoat. In case a smoother surface is needed, the use of MJ-615 as electro-conductive topcoat is recommended.

<Drying and baking conditions>

Primer: The primer shall be applied by spray coating to achieve a film thickness of 10–12 µm and then baked in an oven. Drying conditions shall be 150°C (substrate temperature) for 10–15 minutes.
Mid and Topcoat: MJ-550 shall be applied by electrostatic powder coating and baked in an oven. The baking temperature of the first coat is 380°C (substrate temperature), while that of the second and the subsequent coats is recommended to be 360°C (substrate temperature). The baking time is 30 minutes. For the topcoat, the baking time is recommended to be 60 minutes to achieve a smooth surface.
When applying MJ-615 to the top layer after baking MJ-550 as midcoat, the baking temperature and time shall be 360°C (substrate temperature) for 30 minutes.

The coating thickness per coat and maximum coating thickness are shown in Table1.

Table 1. Typical physical properties

	MJ-550	MJ-615
Color	Black	Black
Particle size d50 (µm)	23–33	22–35
Coating thickness per coat (µm/coat)	50–100	30–50
Maximum coating thickness (µm)	1000	100
Surface roughness Ra (µm)	0.9–1.6	0.6–0.8

<Coating performance>

MJ-550 provides superior corrosion resistance compared with conventional fluoropolymer coatings. In addition, MJ-550 exhibits surface resistivity and volume resistivity suitable for antistatic performance.

Table 2. Corrosion resistance and electro-conductivity of MJ-550 coating

		MJ-550 Coating		PFA Coating	FEP Coating	ETFE Coating
Coating system	Topcoat	-	MJ-615	PFA clear	FEP clear	ETFE clear
	Midcoat	MJ-550	MJ-550	Filled PFA	Filled FEP	Filled ETFE
	Primer	PJ-AL902M	PJ-AL902M	General primer	General primer	General primer
Color		Black	Black	Black	Black	Black
Total thickness		300 µm	350µm	500 µm	500 µm	500 µm
Time of blister appearance *1		> 504 hrs	> 504 hrs	192 hrs	120 hrs	120 hrs
Surface resistivity (Ω/sq) *2		10^4–10^6	10^5–10^7	Non-conductive		
Volume resistivity (Ω·cm) *2		10^4–10^6	10^5–10^7	Non-conductive		

*1 Corrosion test conditions with Atlas cell: Samples were exposed to 5 wt% HCl aq. at 95 °C for 504hrs.
The tests were conducted until the blisters were found.

*2 Applied voltage: 10V

(Both substrates were stainless steel with sandblasted (alumina #60, 5 kg/cm^2)

MJ-550 coating system exhibits extremely low extractable metal ion.

Table 3. Extractable metal ion of MJ-550 coating

Extractable metal ion (ppb) *3									
Li	Na	Mg	Al	K	Ca	Ti	Cr	Mn	Fe
<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.04	<0.04	<0.02	<0.04
Co	Ni	Zn	Cu	Sr	Ag	Mo	Ba	In	Pb
<0.02	<0.02	<0.02	<0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

∗3: Measurement condition: The sample was washed, eluted based on MCF's standard process, and was measured by ICP-MS/MS

All properties and test results presented in this document should be considered typical values, may vary depending on the test specimen and test conditions, and should not be used for specification purposes.

<Handling and Storage>

- Powders shall be stored in sealed plastic bags under optimal storage conditions: 18-27 °C (65-80 °F). Maximum storage temperature shall be 40 °C (105 °F).
- Powders may form lumps during prolonged storage; sieving through a coarse screen shall restore the powder.
- Transport conditions shall be 5–40 °C (40–105 °F).
- For handling instructions, please refer to the Safety Data Sheet (SDS).
- For medical application, please consult Chemours's sales representative.

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