

Fluon® PTFE for Battery Applications

When Failure Is Not an Option

Fluon® PTFE (polytetrafluoroethylene) offers a wide range of outstanding properties, including heat and chemical resistance, non-flammability, excellent electrical insulation, low friction, non-stick characteristics, and strong weather resistance.

Fluon PTFE AD (aqueous dispersion) and CD (coagulated dispersion) grades, produced through an emulsion polymerization process, exhibit unique fibrillation characteristics—meaning the PTFE molecules readily fibrillate under mechanical force. These properties make Fluon PTFE particularly well-suited for use in battery cells.

Fluon PTFE AD (Aqueous Dispersion)

Applications

- Binder for Li-Mn, Zn-Air, Ni-MH, or Li-Ion cells
- Binder for carbon powder in capacitors
- Water-repellent layer in fuel cells

Application Method

0.3-5% of Fluon PTFE AD is mixed with a powder active material by blender, mixer, or kneader. The resulting paste is then applied by coating to mesh-like substrates. Photo 2 shows the fibrillated PTFE. The nonionic surfactant stabilizer in AD grades may decompose when exposed to heat in the range of 250–300°C.

Fluon PTFE AD Grades for Binder Use (Typical Value)

Property	Unit	AD915E	AD939E
PTFE content	%	60	60
Stabilizer	%/PTFE	3	3
Specific gravity		1.52	1.52
Viscosity	MPa·s	20	20
pH		9~11	9~11
Mean particle size	µm	0.25	0.30
Molecular weight of PTFE		Medium	High



Photo 1. Aqueous Dispersion

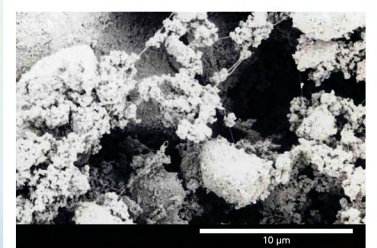
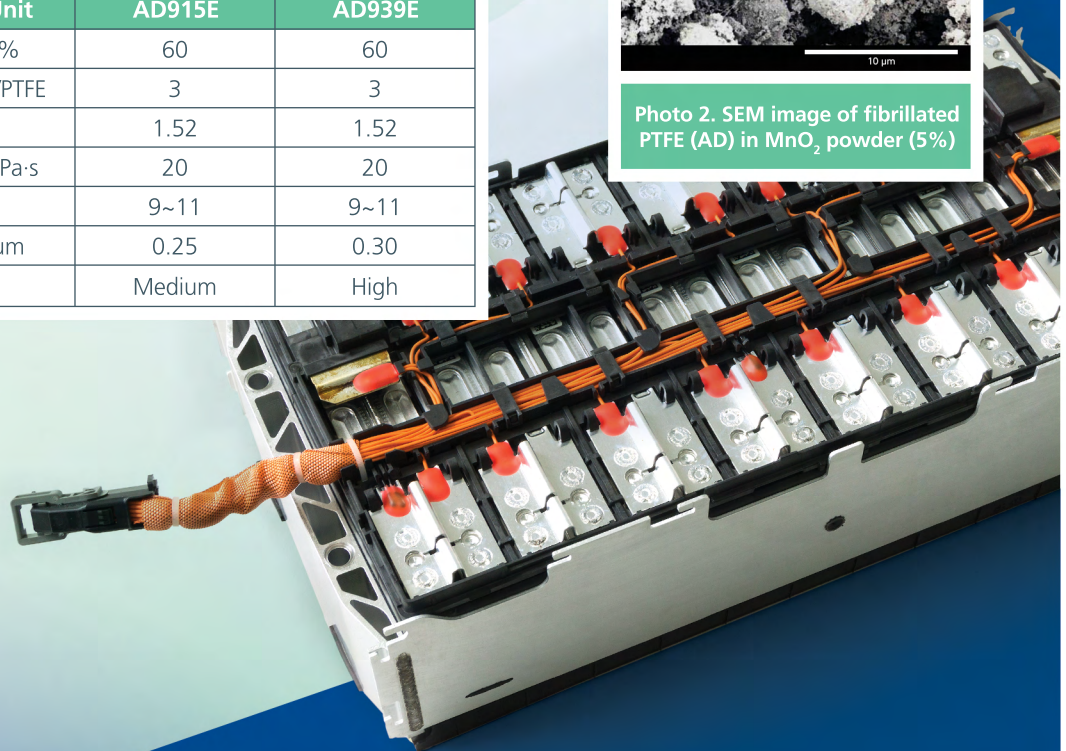


Photo 2. SEM image of fibrillated PTFE (AD) in MnO₂ powder (5%)



Fluon PTFE CD (Coagulated Dispersion)

Applications

- Separator sheet in coin-type Li-Mn or Zinc-Air cells

Application Method

Fluon PTFE CD is processed by stretching into porous sheet. The PTFE sheet has good ion transferability, electrical insulation, chemical and thermal stability. Photo 4 shows the fibril structure of stretched PTFE CD.

Fluon PTFE CD Grades for Separator Sheet (Typical Value)

Property	Unit	CD1E	CD145E	CD123E
Bulk density	g/L	540	500	540
Median particle size	µm	550	550	475
Specific gravity		2.22	2.17	2.16
Tensile strength	MPa	34	37	39
Elongation	%	350	310	300
Molecular weight		Medium	High	High

Disclaimer: The data listed here represent typical values only and should not be used to establish specification limits or design criteria.

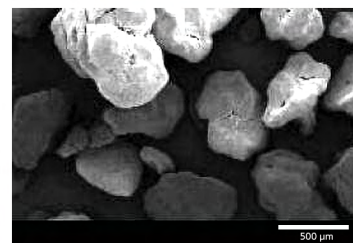


Photo 3. SEM image of CD powder

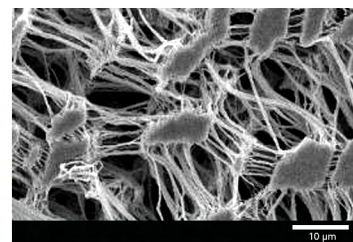


Photo 4. Fibril structure of stretched PTFE CD



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