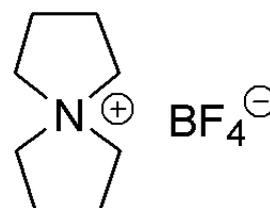


KKE Series

1. Product features

Electric Double Layer Capacitor (EDLC) is expected to be used in mobile terminals, UPSs, energy storages for vehicles and smoothing output from solar cells or wind generators.

Japan Carlit offers various types of electrolyte solution with high performance electrolyte, spiro-(1,1')-bipyrrolidinium tetrafluoroborate (SBP-BF₄), which was originally developed by us.



Structure of SBP-BF₄

Main features are follows:

- ✓ High solubility to various organic solvent, (3.5mol/L to PC, also soluble to normal chain carbonate)
- ✓ Low viscosity and high conductivity comparing to typical quaternary ammonium salt electrolytes,
- ✓ Highly stable for electrical/thermal stress,
- ✓ Lower internal resistance, better temperature characteristics and better capability for large current charging/discharging than other quaternary ammonium salt electrolytes like TEA-BF₄ and TEMA-BF₄.

KKE Series electrolyte solutions

Solvent	Product	Composition	Conductivity /mScm ⁻¹	Note
Carbonate type	KKE-15	1.5M PC	16 (@25°C)	Standard grade
	KKE-15D	1.5M PC/DMC	19 (@25°C)	High conductivity grade
Nitrile type	KKE-10TAN	1.0M AN	54 (@25°C)	
Sulfolane type	KKE-20MSX	2.0M SL/DMS	6.6 (@25°C)	High break-down voltage grade (for 3.0V rated voltage)
	KKE-15ES	1.5M SL/EMS	6.0 (@25°C)	
	KKE-15EiPS	1.5M EiPS*	5.8 (@25°C)	

PC: propylene carbonate, DMC: dimethyl carbonate, EC: diethyl carbonate, SL: sulfolane, DMS: dimethyl sulfone, EMS: ethylmethyl sulfone, EiPS: ethylisopropyl sulfone, AN: acetonitrile
 * under development, engineering sample available

Electrolyte solutions with special composition are available upon request.
 We can also offer the electrolyte salt only.

2. Production/Supply system

Packaging

Two types of packaging are available.

Canister (returnable container)

Capacity: 200L, 100L, 10L

Net weight* of KKE-15 is 240kg(200L), 120kg(100L), 25kg(20L).

One-way drum

Capacity: 200L, 20L

Net weight* of KKE-15 is 240kg(200L), 20kg(20L).

* Net weight varies depend on compositions of electrolyte.



Example of the canister

Example of standard for electrolyte solution (KKE-15)

Conductivity /mScm ⁻¹	Na, K /ppm	water content /ppm	Halogen /ppm	Metals (Fe, Pb) /ppm
16±1	100>	30>	5>	5>

Production Facility

Our production facility is fully automated to achieve stable production of high quality electrolyte.

It also equipped variety of analytical apparatus for quality control and trouble shooting.



Electrolyte Production Plant
at Gunma factory, Japan



Reactors



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