The FDK Group has been focusing on the development of a capacitor, a new energy device to realize the environment-conscious storage and supply of electricity. We will contribute to the realization of an energy-saving society by developing and providing unique products based on the technologies we have nurtured through material development and battery manufacturing.

Feature Article

FDK's New Product Development

Contributing to an energy-saving society by developing and providing capacitors

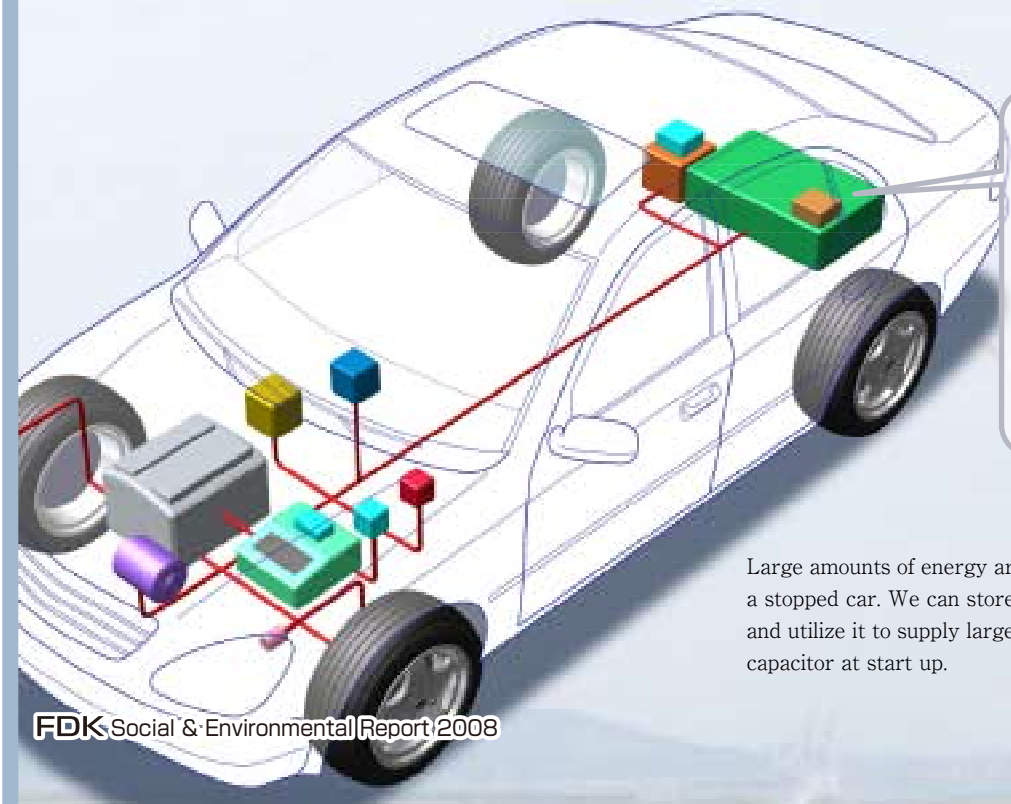
What Is a Capacitor?

A capacitor is a type of condenser that can store and discharge needed electricity.
A capacitor does not generate electricity and, unlike dry batteries and solar batteries, it can be used over and over to store and discharging electricity. A capacitor has the following features, features that are not available from rechargeable batteries, where electricity is stored with chemical change.

① Takes a very short time to charge
② Can make large output available with little discharge loss
③ Can store and discharge repeatedly and has long service life
④ Can charge with a low voltage

Capacitor Applications

In the face of environmental issues, global warming and the surge in crude oil prices, industries are now redoubling their efforts to save energy and veer away from excessive reliance on gasoline. This is where the need for effective energy utilization with capacitors has emerged. Capacitors contribute to energy saving by their ability to store electricity when not in use and discharge electricity as needed. Systems combining capacitors with new energy sources with variable output such as automotive and wind power generation are being built. With capacitors energy can be recovered from the breaking heat, and potential energy in vertically-moving machinery such as elevators, escalators and cranes.
Since capacitors can be charged with low direct current, they are highly compatible with solar power generation and offer excellent future prospects.



Capacitors

Applications
- Automobile
- Construction vehicles
- Wind-power generation
- Solar power generation
- Voltage sag correctors
- Uninterrupted power supplies, etc.

Large amounts of energy are necessary to start an engine or move a stopped car. We can store energy from the heat of breaking, etc. and utilize it to supply large current instantaneously by means of a capacitor at start up.

Ongoing Development at FDK

FDK is now developing a new line of capacitors featuring larger capacitance than conventional capacitors and higher output than batteries. This product category should satisfy the upcoming needs of our energy-saving society.
The inherent characteristic of a capacitor is its ability to supply large current instantaneously. However, if the internal resistance is not low, large current cannot flow to capitalize on the merit of the capacitor. Large capacitance is also required to sustain the flow of large current. Therefore, FDK has developed a new type of large capacitance, the low internal resistance capacitor "EneCapTen."

"EneCapTen" Features

- Compact and large capacitance
- Long service life
- High output
- High operational voltage
- Excellent high temperature characteristics

Comparison of Electric Characteristics between the "EneCapTen" and Conventional Capacitors

Electric Characteristics	EneCapTen	Electric Double Layer Capacitor
Maximum Voltage (V)	3.6 to 4.0	2.3 to 2.5
Minimum Voltage (V)	1.8 to 2.2(*1)	0.0
Capacitance	○	×
Output power	○	○
Reliability at High Temp.	◎	○
Cycle Life	○	○
Operating Temperature (℃)	−20 to 80	−20 to 60

*1 There is a lower voltage limit which requires over-discharge protection. FDK has developed protective circuit technology in-house.

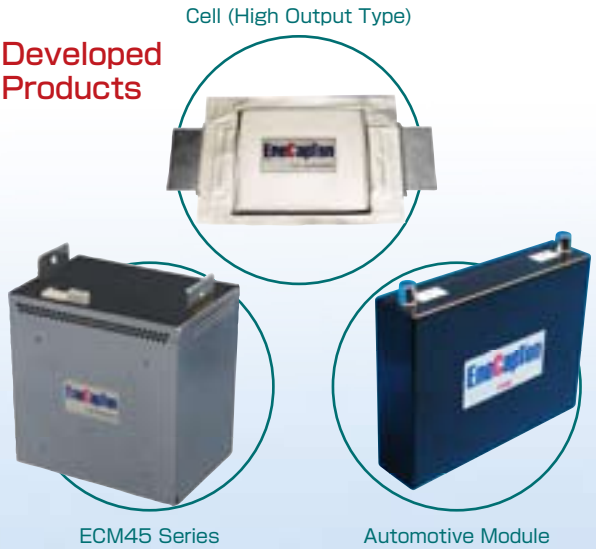
"EneCapTen" was exhibited at "CEATEC JAPAN 2007" and "TECHNO-FRONTIER 2008," where is received favorable reviews by many visitors.

CEATEC JAPAN 2007

Large Capacitance High Output "EneCapTen"

"EneCapTen" maintains the characteristics of accepting and discharging large current, and allows for repeated charge and discharge in electric double layer capacitors, which represents the mainstream for large capacitance capacitors. In addition, "EneCapTen" offers the advantage of increased output due to larger capacitance and higher operational voltage, as well as having a higher operational temperature range. Like electric double layer capacitors, "EneCapTen" does not require the use of heavy metals, making it a clean and environmentally friendly device.

Developed Products



The control circuit comes standard with cell balance, overcharge and over-discharge protection features as well as external interface.

Contributing to Environmental Conservation through the Effective Use of Energy

FDK's large capacitance high output capacitor "EneCapTen" is characterized by its ability to operate under temperatures as high as 80℃ and offers long service life. This allows operation in stringent environments formerly impossible for conventional electric storage devices, greatly expanding its application potentials. There have been many cases where precious energy has been wasted simply because an effective electric storage device could not be installed. This new device can effectively utilize such energy and contribute to Earth's environmental conservation.

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