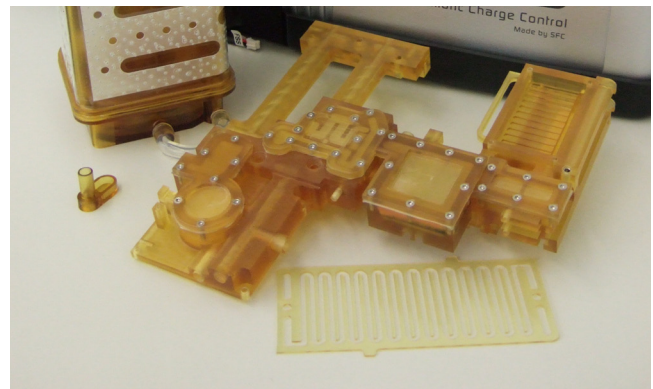


LONG-LASTING POWER ON DEMAND

CASE HISTORY



APPLICATION

Fuel Cells

PRODUCT LINE

EFOY ("Energy for You") miniaturized fuel cells

MANUFACTURER

SFC Smart Fuel Cell AG (SFC)

KEY CHALLENGES

Withstanding the effects of liquid methanol, flame retardance, resistance to temperature extremes, purity to prevent chemical migration

SOLUTION

High performance methanol-resistant thermoplastic materials, ULTEM™ 1000B film and ULTEM 1000 resin from SABIC

RESULTS

SABIC materials help bring a new mobile energy source to market, increasing productivity and reducing costs

CHALLENGES

To produce the small, portable fuel cells for its EFOY product family, SFC required materials that could withstand the effects of liquid methanol, an aggressive solvent that can harm many thermoplastics. Other requirements were flame retardance, resistance to temperature extremes, and purity to prevent the migration of chemicals into the methanol, which could impact the fuel cell's efficiency.

SOLUTION

ULTEM 1000B film and ULTEM 1000 resin, thermoplastic polyetherimide (PEI) materials from SABIC – The high performance ULTEM film, cut to size by SABIC HIFI Polymershapes in a thickness range of 0.150 to 0.750 mm, can be used directly in the cells, while the injection-molded ULTEM resin can be used in components that make contact with methanol, such as methanol tanks. Specifically, the solution:

- Addresses the need for resistance to methanol. The ULTEM film and resin were tested by immersing each in a water-methanol solution for thousands of hours, demonstrating that neither becomes damaged by the aggressive chemical

SOLUTION (continued)

- Provides inherent flame retardance (FR) that is an important requirement of power sources, while avoiding the use of halogenated FR additives that are being restricted in many areas of the world
- Provides high purity, which avoids the issue of chemicals leaching from the plastic into the liquid methanol and impacting its efficiency, even at temperatures as low as -30 °C and as high as 100 °C
- Enables faster commercialization. The ULTEM™ film can be cut into precise shapes and formed into complex parts with ease, and injection molding of ULTEM resin supports mass production of the EFOY fuel cells

RESULTS

SFC was able to enhance their ability to mass-produce the EFOY products to meet growing demand using SABIC's ULTEM 1000B film and ULTEM 1000 resin, allowing them to cut the price of fuel cells, further driving adoption of this innovative technology.

FURTHER INFORMATION

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