

# Clean, safe energy – anytime, anyplace

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## Background information on EFOY Fuel Cartridges

# M28



Fuel cartridges	M5	M10	M28*
Volume	5 liters	10 liters	28 liters
Weight	4.3 kg	8.4 kg	22 kg
Rated capacity	5.5 kWh	11.1 kWh	31.1 kWh
Art. No.:	150 905 006	150 905 008	150 905 040

\*Requires the M28 adapter (optional equipment)

„We have performed extensive testing on the EFOY Fuel Cartridges. Based on the results of these tests they were awarded the TÜV GS mark for approved safety by TÜV SÜD Product Service GmbH. With these fuel cartridges SFC provides fuel to their fuel cell customers in a form that is very safe and easy to transport.“

**Jens Fleitmann, Manager for Alternative Energies at TÜV SÜD Industry Service GmbH**

When we fill EFOY Fuel Cartridges, we make sure that we maintain SFC's extremely high quality and purity standards.“

**Matthias Kunz, General Manager of ACC Beku GmbH, manufacturers of EFOY Fuel Cartridges**

- ⚡ Patented welded safety valve prevents dripping
- ⚡ TÜV seal of approval
- ⚡ UN-certified for air transport

Every fuel cell made by SFC Smart Fuel Cell is based on DMFC (Direct Methanol Fuel Cell) technology. The technology makes use of an environmentally friendly catalytic process which transforms methyl alcohol into electricity - directly, efficiently, and without any intermediate steps, making it one of the cleanest ways to produce power.

Below you will find a discussion of several safety and environmental features of our fuel cartridges.

SFC has made safety and the environment a top priority right from the start. We set out to offer customers an efficient and reliable alternative energy solution, while creating the international infrastructure needed to distribute the fuel. Today SFC customers can purchase safety-certified EFOY Fuel Cartridges at more than 1,000 outlets all over the world – and the network keeps on growing.

### Important facts about EFOY Fuel Cells

#### ⚡ Certified safety

EFOY Fuel Cartridges were especially designed for safe and easy operation. They are constructed so that users never have to come into contact with the contents. The fuel cells not only meet the most stringent safety standards; they also bear both the TÜV GS seal of safety and UN certification for air transport.

#### ⚡ Take it anywhere – even to a nature preserve!

EFOY Fuel Cartridges are certified for transportation by land, water and even by air. Got any questions about storage, transportation or other topics? Talk to us!

#### ⚡ Safe to store and use in closed spaces

It is safe to store and use SFC Fuel Cells and cartridges in closed spaces as long as you heed the installation and operation instructions. If the cell is going to be housed in a tight space, make sure that there is enough room for the exhaust (carbon dioxide and water) to escape as well as enough fresh air for the fuel cell. The TÜV certification process has proven that if materials are handled properly, no volatile fumes can result.



# Important facts about EFOY Fuel Cartridges



### ⚡ Certified safety

- The EFOY M5 and M10 fuel cartridges bear the **TÜV seal of approval**. EFOY Fuel Cartridges have been designed to meet the most stringent safety standards right from the start. The high-impact plastic containers have stood up to challenging tests.



- EFOY Fuel Cartridges also come equipped with a **safety valve** to prevent methanol from escaping. It only opens once the cartridge has been connected to an SFC Fuel Cell. If the cartridge is removed, the safety valve hermetically reseals the cartridge. At no time does the user come in contact with methanol. This method is far safer, cleaner, and more convenient than fueling gasoline or diesel generators.
- We have conducted **numerous tests under real conditions** such as vibration, shock and temperature tests in conjunction with neutral testing organizations. It's your guarantee of safe transport.
- EFOY Fuel Cartridges also meet the tough demands of military applications. Various **military organizations** have conducted **extensive field tests under the toughest conditions to ensure that the cartridges are bullet- and flameproof.**

### ⚡ One-way cartridges for the sake of purity

EFOY Fuel Cartridges contain ultrapure methanol specially formulated for SFC Fuel Cells. SFC checks quality constantly and guarantees molecular purity to prevent irreversible damage to the fuel cell that might be caused by invisible chemical impurities – something that is commonplace in commercial methanol. Damage caused by using contaminated fuel is not covered by the general warranty. In order to guarantee purity and safety, fuel cartridges are used only once.

### ⚡ Easy disposal

Once they are completely empty, fuel cartridges may be disposed of like other plastic containers. Disposal of fuel cartridges with significant amounts of residual fuel is subject to local regulations.

### ⚡ Manufactured with the environment in mind

Most methanol today is still produced from natural gas. Several of SFC's suppliers, however, are using renewable sources such as biomass and, increasingly, household refuse, to produce methanol. Methanol is derived from raw materials that are subjected to high temperatures (approximately 1000° centigrade) in a reactor where they are transformed into a gas.



# EFOY Pro – clean, safe energy



## The advantages of methanol in a nutshell

Methanol possesses a number of advantages compared to commonly used fuels.

### ⚡ Extremely high energy density

10 liters of methanol are enough for 11.1 kilowatt hours of electricity, but weigh only 7.9 kg – that's about 1400 watt hours per kg

### ⚡ A higher flash point and higher ignition temperature than gasoline

Methanol is much safer than gasoline

### ⚡ Methanol can be generated from renewable resources

Sources include biomass or even household refuse

### ⚡ Biodegradable

Methanol harms neither the water table nor the ozone layer, nor is it carcinogenic. It occurs naturally, in low concentrations, in fruits, wood and even in human beings

### ⚡ The EFOY Fuel Cartridge is safety-tested

### ⚡ Available at more than 1000 sales points throughout the world

### ⚡ Not explosive

Numerous tests by neutral organizations have confirmed that there is no danger of explosion as long as cartridges are used in accordance with instructions

## Comparison to other fuels

Substance	Flash point (°C)	Explosion threshold (Vol.- %)		Ignition temperature (°C)	Hazardous substance code
<b>Methanol</b>	11	5.5	37	455	
<b>Gasoline</b>	< -20	0.6	8	200 – 410	
<b>Diesel</b>	> +55	0.6	6.5	approx. 220	
<b>Sulfuric acid (batteries)</b>	Highly flammable gas may be produced which can form an explosive atmosphere				
<b>Notes</b>	Lowest temperature at which sufficient flammable gases may arise to allow combustion	Mixtures of flammable gases, vapors, or particles with oxygen or air in certain proportions can be explosive. That is why an upper and lower range has been indicated for these mixtures		Temperature at which a substance self-ignites	toxic irritant harmful to the environment corrosive lightly flammable highly flammable