

Rheion[®] - Heat control at the source

Fluid that moves without a pump. Cooling that responds instantly to hotspots. No moving parts. Built to outlast the system around it.

Rheion[®] delivers precision cooling based on integrated liquid flow control. Fluid motion is generated by electric fields interacting with charged species in dielectric liquid through molecular mechanisms. Without moving parts, operation is silent and vibration-free with mechanical wear eliminated.

Benefits

Efficient

Cooling is directed to where heat is generated and does not create traditional mechanical friction, meaning less energy is wasted.

Silent

Construction with no moving parts gives a silent, vibration free operation.

Compact

No bulky cooling house, can be integrated in various applications, exactly where the cooling is needed.

Durable

Maintenance-free and developed to handle challenges with extreme temperatures in space, proven under radiation, vacuum, vibration.

Responsive

Active cooling controls generates flow locally at the heat source in immediate response to hotspots.



Applications

Space thermal control

Maintaining stable temperature in thermally sensitive instruments and sensors, including orbital conditions in spacecraft moving between sunlight and shadow.

Data center cooling

As rack densities exceed 80 kW, traditional air and cold plate cooling reach their limits. Rheion® units bring cooling control to the source, cutting cooling energy by 20 to 30 percent while enabling higher compute density and quieter operation.

Defense systems

Compact design, no moving parts and no required maintenance meet the reliability demands of mission critical hardware operating in extreme environments.

Battery thermal management

Using the same chip-level cooling principle to battery cells, Rheion®'s active liquid cooling address fire risks and lifetime, where traditional solutions with uneven temperatures and performance losses limit lithium-ion battery safety.

Technical Data

- Non-conductive, fire-proof, dielectric fluid.
- Heat loads up to the kW
- Open or hermetic construction for extended temperature range and radiation tolerance.

Typical flow	~100 ml/min to ~1000ml/min
Power consumption	0.1 to 1W
Design lifetime	7~20 years

About APR

APR Technologies is a Swedish deep tech company, developing and producing high-performance liquid cooling solutions for applications in chip cooling, batteries, space and defence. The technology directs cooling liquid flow directly to the heat source using no moving parts and is protected by more than 70 granted patents in 22 countries. APR Technologies is headquartered in Enköping, Sweden.

