Solstice

THERMALWORKS LEADS THE WAY IN DATA CENTER COOLING WITH SOLSTICE® REFRIGERANT TECHNOLOGY

Powered by Solstice hydrofluoroolefin (HFO) refrigerants, ThermalWorks offers one of the first ultra-efficient[1], high-density waterless cooling solution for the evolving demands of AI.



ADVANCED DATA CENTER COOLING HAS ARRIVED

BACKGROUND

ThermalWorks, based in New York and a subsidiary of Endeavour, is a leading provider of advanced waterless modular cooling systems for data centers and commercial buildings. Its hyper-efficient[1] chillers are built to handle high-density AI loads and high ambient temperatures while significantly reducing energy usage and eliminating water consumption. The fully-integrated end-to-end system also speeds up deployment through prefabricated, modular components.

Source: Edged Energy



CHALLENGE

More data centers are being built to handle the ever-increasing density loads that are required from artificial intelligence (AI) and high-performance GPU-based computing. Forging a new path, ThermalWorks has devoted its focus to transforming cooling solutions with cutting-edge thermal technology. Its innovative systems deliver efficiency and reliability, empowering industries to achieve peak performance while reducing environmental impact and eliminating water consumption.

In searching for the optimal refrigerant for its C1000/C2000 systems, only a low global warming potential (GWP) refrigerant with a proven ability to meet its most stringent performance requirements would do.

SOLUTION

Solstice Advanced Materials is a leading global specialty materials company that advances science for smarter outcomes. Solstice offers high-performance solutions that enable critical industries and applications, including data center cooling, refrigerants, semiconductor manufacturing, nuclear power, protective fibers, healthcare packaging and more. Solstice is recognized for developing next-generation materials through some of the industry's most renowned brands, including Solstice®.

As demand for AI and high-performance computing continues to grow, efficient and reliable data center cooling has become increasingly important. ThermalWorks has selected Solstice refrigerant technologies to support its cooling solutions in both Europe and the United States.

In the EU, ThermalWorks adopted Solstice® ze, a low global warming potential (GWP) refrigerant with a GWP of less than 1, based on the IPCC Sixth Assessment Report (AR-6). For the US market, ThermalWorks utilizes **Solstice N15 (R-515B),** supporting data center cooling applications with solutions aligned to evolving industry requirements.

Through its portfolio of advanced refrigerant technologies, Solstice helps enable cooling solutions for critical infrastructure applications where performance, reliability and sustainability are increasingly important. The company's expertise in refrigerants, data center cooling and advanced materials supports customers as they address growing thermal management needs across digital infrastructure.

By combining innovation in chemistry, application development and refrigerant technologies, Solstice continues to support the development of next-generation cooling solutions designed to meet the demands of an increasingly connected and data-driven world. Through collaboration with customers and technology providers, Solstice helps advance solutions that can contribute to the performance and efficiency requirements of modern data centers.

Source: Solstice Advanced Materials

RESULT

ThermalWorks stands out for offering a waterless, high-efficiency system—engineered to work seamlessly with Solstice® N15 (R-515B) in the U.S. and R-1234ze in the EU—designed to reduce total cost of ownership through lower energy consumption, zero cooling water use and simplified deployment of ThermalWorks systems[2].

The ability to comply with regional policies while offering the same core solution globally was a major factor for many customers choosing its cooling platform. The system enables among the lowest peak and average power usage effectiveness (PUE) values reported for air cooled chiller systems, cutting overhead energy consumption by 72% compared with the global average–even in the hottest climates.[1]

By eliminating ongoing water consumption for cooling, ThermalWorks can save more than 1.46 billion liters (385 million gallons) of water each year for every 100 MW data center compared with water-cooled alternatives.[2]

The ultra-efficient[1], modular design has the potential to significantly reduce energy usage and reduce ongoing water use in the cooling process[1].

EDGED DATA CENTERS

ThermalWorks chillers using R-1234ze and R-515B have already revolutionized cooling for the Edged global platform of data centers located across North America and Europe, including data centers operating in Atlanta, Chicago, Columbus, Dallas and Kansas City in the U.S. and Barcelona, Bilbao and Madrid in Spain. Portfolio-wide, these have an average power usage effectiveness (PUE) of 1.15, which is well below the industry standard of 1.54.[1]

In addition to delivering an industry leading PUE, these data centers feature AI-ready cooling that supports densities up to 400+ kW/rack with liquid cooling and 120+ kW/rack with air cooling today — and adapt to emerging 600 kW racks in the future.[2]



> Our energy-efficient, waterless cooling system is designed to meet the dual challenges of climate change and advanced computing head on. ThermalWorks is a future proof solution for a warming world.
>
> **JOHN COSTAKIS**
> *Chief Executive Officer, ThermalWorks*

> Meeting the growing demands of AI and digitalization requires continuous innovation across the data center ecosystem. At Solstice Advanced Materials, we are proud to contribute solutions that help customers improve operational efficiency, conserve energy and water resources, and prepare for the infrastructure needs of the future.
>
> **JULIEN SOULET**
> *VP General Manager, Solstice Advanced Materials*

Source: Edged Energy

1. Edged U.S. | Atlanta | Download the specs sheet for more information.
2. Edged Partner ThermalWorks Launches AI-Ready Waterless Cooling System Worldwide
   Edged U.S. | Atlanta | Download the specs sheet for more information.

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