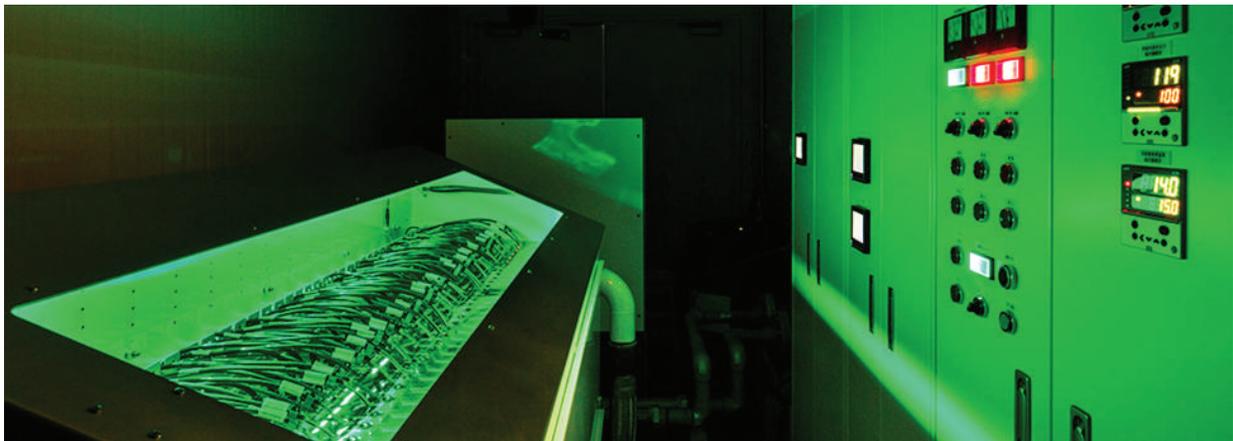




## Liquid Immersion Cooling from Green Revolution Cooling helps Tokyo Institute of Technology Achieve Top Honors at Green500 Three Years in a Row



*The latest Green500 list of most efficient supercomputers in the world was announced during the SC15 conference in Austin, Texas. For the third consecutive year, the Green Revolution Cooling-powered Tsubame-KFC supercomputer at Tokyo Institute of Technology has achieved top honors, this year ranking as the most efficient commercially available setup, and second overall.*

**AUSTIN, TX – December 2, 2015.** The results for the latest edition of the Green500 list of the most efficient supercomputers were announced during the SC15 (Supercomputing 2015) conference held in Green Revolution Cooling's hometown of Austin, Texas, last week. Tokyo Institute of Technology's Tsubame-KFC super computer, running in Green Revolution Cooling's oil immersion cooling system came out ahead of a number of past winners as the most efficient commercially available solution, and the second most efficient supercomputer overall. This is the third year in a row in which the system has received top honors on the list, previously being ranked #1 in November 2013, and June 2014.

"This is truly a great win for us, as one of our systems has steadily remained among the most efficient supercomputers for three years in a row. This is unheard of in the highly competitive and fast-changing world of HPC. Tokyo Institute of Technology is a banner customer and we will continue to work with them to break more records," said Christiaan Best, CEO and Founder of Green Revolution Cooling.

Both in November of 2013 and June 2014, the Tsubame-KFC (Kepler Fluid Cooling) system achieved the No.1 ranking on the Green500, also becoming the first supercomputer to break the 4 PFLOPs/W mark, ahead of its nearest competitor by over 20%. In this year's edition, both of the top systems were immersion cooled, truly exemplifying the power and efficiency of this method of cooling. While the Tsubame was cooled by Green Revolution Cooling's mineral oil based ElectroSafe coolant, the RIKEN system was cooled with a 3M Fluorinert fluid in a custom cooling solution.

A recent white paper by Toshio Endo, Akira Nukada, and Satoshi Matsuoka of TI Tech, describes why the Tokyo Institute of Technology chose the GRC solution for the Tsubame-KFC and how the technology played a crucial part in helping TI Tech achieve record breaking efficiency:

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*Ahead of overview of TSUBAME-KFC's cooling technology with warm liquid (oil) submersion, we discuss the cooling methodologies; While submersion cooling has been deployed in the past in machines such as the Cray-2, the Florinate coolant utilized was extremely expensive, and moreover evaporated at low temperature of 56 degrees Celsius, and in fact the vapor was collected to be re-condensed, requiring airtight packaging.*

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The complete white paper can be accessed via Green Revolution Cooling's website [<http://www.grcooling.com/portfolio-item/white-paper-tokyo-tech-tsubame-kfc>] For more information on liquid immersion cooling, please visit Green Revolution Cooling at [www.grcooling.com](http://www.grcooling.com) online.

## **About Green Revolution Cooling**

Green Revolution Cooling creates the most powerful, efficient, cost effective solution for data center cooling in the world. GRC offers the CarnotJet System, a liquid submersion cooling system for any rack-based OEM server. It uses a non-toxic mineral oil with 1,200x more heat capacity by volume than air with end results which allow for 95% less cooling power used, 10-25% less server power used, dramatically reduced infrastructure costs and increased server reliability. Visit [www.grcooling.com](http://www.grcooling.com) for more information.

Connect with GRC on Twitter ([twitter.com/GRCooling](https://twitter.com/GRCooling)), Youtube ([youtube.com/GRCooling](https://youtube.com/GRCooling)), and LinkedIn ([linkedin.com/company/green-revolution-cooling](https://linkedin.com/company/green-revolution-cooling)).

## About Tokyo Institute of Technology - Global Scientific Information and Computing Center

The Global Scientific Information and Computing Center (GSIC) was established in April 2001 by amalgamating the Tokyo Institute of Technology's Computer Center and the International Cooperation Center for Science and Technology.

GSIC's missions are to apply advanced information technology to support research and education activities and to use the technology as a medium for promoting research collaboration at an international level. In line with these missions, GSIC has been showing steady results in developing the university's information infrastructure and supporting its operation, in supporting cutting-edge research in high-performance computation and further research based on its findings, as well as in using it to promote international labor cooperation.

In recognition of GSIC's achievements, it was designated a Joint Usage / Research Center alongside the seven other similar centers nationwide. Starting April 2010, the GSIC commenced activities as one of the constituent centers of the Japan High Performance Computing and Networking plus Large-Scale Data Analyzing and Information Systems. Visit [www.gsic.titech.ac.jp/en](http://www.gsic.titech.ac.jp/en) for more information.

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