For Immediate Release

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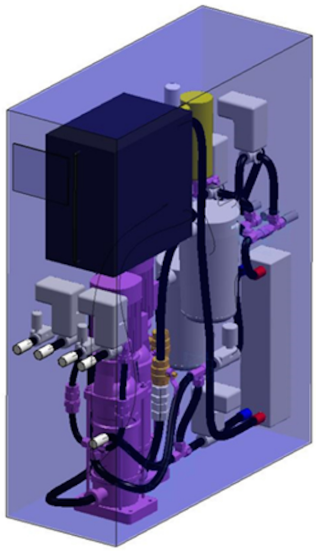

Laird's Liquid Cooling Systems and Temperature Controllers Designed for Semiconductor Fabrication Equipment

Laird's comprehensive thermal management solutions deliver complete cooling systems with precise temperature control and stability for semiconductor process equipment…

August 23, 2016 – Laird Thermal Systems has developed custom cooling and temperature control systems for semiconductor fabrication equipment. The critical production tools used in semiconductor fabrication facilities must be reliable and easy to service to minimize downtime. Laird's custom liquid cooling systems for semiconductor tools - which can include heat exchangers, pumps, sensors, thermoelectric coolers, thermoelectric cooler assemblies, thermoelectric chillers, compressors, flow controllers, temperature controllers, and more - are specifically designed to keep these tools running at precise temperatures.

Thousands of cooling and temperature control systems are installed and operate continuously in fabrication facilities. The cooling capacity demands vary from a couple of hundred Watts (thermoelectric chiller and compressor based systems) to hundreds of Kilowatts (liquid-to-liquid cooling systems) with required temperature control ranges from -80°C to +150°C. The majority of applications only require one stable temperature set point. However, in the final chip test environment, temperatures are required to vary in order to stress the chip. Here different temperature set points need to be obtained by a single thermal management system. Due to the high-precision processes, tool manufacturers demand a very stable temperature environment. Typical of these requirements are +/-0.1K stability (e.g. for etching) to ±0.001K (e.g. for lithography), while cooling capacities can be up to several kilowatts.

In semiconductor fabrication facilities, Laird's custom multistage compressor based chillers are used to support cooling for very low temperature requirements. Most standard chillers need some form of modification to meet semiconductor process facility requirements and may even require a water-cooled condenser. Laird's liquid-to-liquid cooling systems operate close to

ambient and are based on a fluid-to-fluid heat-exchange principle. Laird also offers cost-efficient thermoelectric-based (19” rack) cooling systems for etch applications.

Laird’s custom cooling systems have a water-cooled evaporator instead of an air-cooled evaporator. A liquid-to-liquid solution is quieter than a liquid-to-air system because a fan is not required. More importantly, the heat can be rejected by available general facility cooling water and may not be rejected into the air temperature conditioned environment.

Laird cooling systems can be positioned near the production tool, hidden in a false floor or on the lower level in a sub-floor and are built to meet SEMI S2 or F47 standard, including seismic protection. Laird’s cooling and temperature control systems can be configured to meet cleanroom requirements.

A semiconductor fabrication environment is one of the most challenging applications for designing and building liquid based cooling systems. Careful consideration is required not only for component selection, but also for the overall liquid cooling system unit and its integration with the semiconductor tools. System challenges that designers face include the type of heat transfer mechanism utilized on the control and heat dissipation sides, material compatibility, valve control, cleanliness, space optimization, semi compliance and serviceability. These are all areas that need of attention to properly ensure optimized total cost of ownership.

“Laird has expertise in engineering design services and a global presence that supports onsite concept generation, thermal modeling, mechanical and electrical design and rapid prototyping,” said Anders Kottenauer, Senior Vice President of Laird's Engineered Thermal Systems Business. “We also offer validation test services to meet unique compliance standards for the semiconductor industry.”

Laird’s advanced temperature controllers also offer monitoring and alarm functionality, which is critical to maximizing semiconductor equipment uptime.

More information on Laird’s custom liquid cooling systems can be found by visiting https://www.lairdthermal.com/products/liquid-cooling-systems

About Laird Thermal Systems

Laird Thermal Systems develops thermal management solutions for demanding applications across global medical, industrial, transportation and telecommunications markets. We manufacture one of the most diverse product portfolios in the industry ranging from active thermoelectric coolers and assemblies to temperature controllers and liquid cooling systems. Our engineers use advanced thermal modeling and management techniques to solve complex heat and temperature control problems. By offering a broad range of design, prototyping and in-house testing capabilities, we partner closely with our customers across the entire product development lifecycle to reduce risk and accelerate their time-to-market. Our global manufacturing and support resources help customers maximize productivity, uptime, performance and product quality. Laird Thermal Systems is the optimum choice for standard or custom thermal solutions. Learn more by visiting www.lairdthermal.com