

Thermal Management for

Industrial Applications



Industrial Applications Cooling

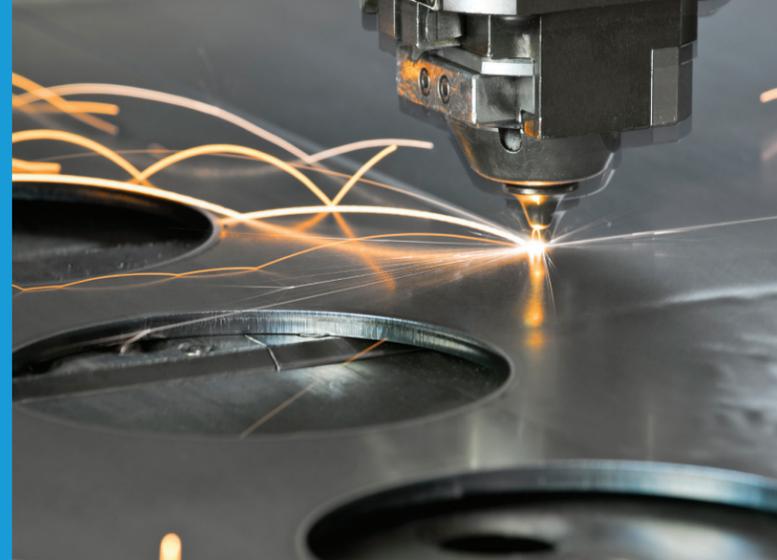
The cooling capacity demands for industrial equipment, such as industrial lasers, CMOS sensors and semiconductor fabrication, can vary from a couple of hundred Watts to hundreds of Kilowatts with required temperature control ranging from -80°C to +150°C.

Laird Thermal Systems offers both solid-state thermoelectric and liquid cooling solutions that address the wide range of cooling and temperature control requirements.

We partner with customers from various industrial market applications including

- Industrial Laser
- Additive Manufacturing
- Laser Projection
- CMOS Sensors
- Infrared Range (IR) Sensors
- Inspection Systems
- Semiconductor Fabrication

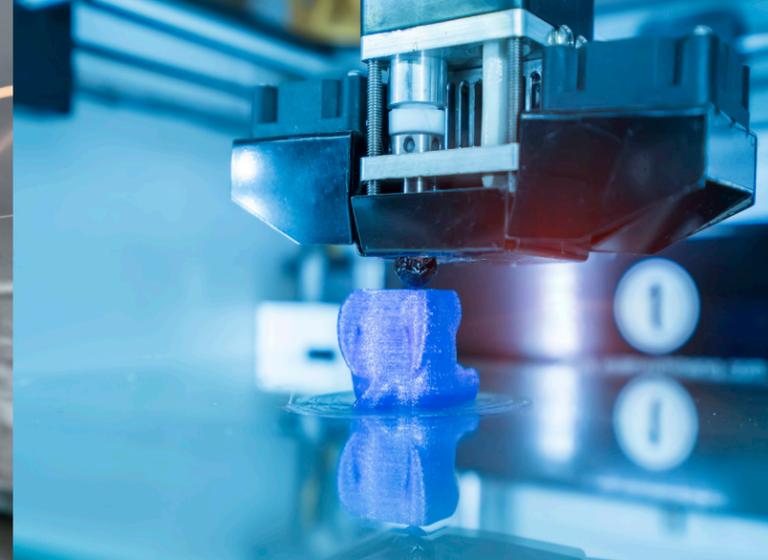
Find all our industrial applications here



Industrial Laser

Whether used for cutting, welding, micro-machining or drilling, industrial lasers generate a significant amount of heat that needs to be managed and quickly dissipated.

- Temperature stabilization ensures
- Maximum focus**
- Repeatability**
- Long-life operation**



Additive Manufacturing

3D printing machines utilize lasers to create a solid three-dimensional part. Sensitive electronics must be protected from the large amount of heat generated by the laser.

- A thermal solution will enable
- High-quality parts**
- Long-life operation**



Laser Projection

Laser projectors used for entertainment applications utilize laser modules to generate high-quality images. Heat load in each laser can be more than 100 Watts and must be efficiently dissipated.

- Thermal management will
- Extend laser life-time**
- Enable crisp image resolution and a wide color palette**

LAIRD THERMAL SYSTEMS PRODUCTS AND SOLUTIONS

Nextreme™ Performance Chiller
UltraTEC™ UTX Thermoelectric Cooler

Learn more about **Industrial Laser**

Nextreme™ Performance Chiller
UltraTEC™ UTX Thermoelectric Cooler

Learn more about **Additive Manufacturing**

UltraTEC™ UTX Thermoelectric Cooler

Learn more about **Laser Projection**

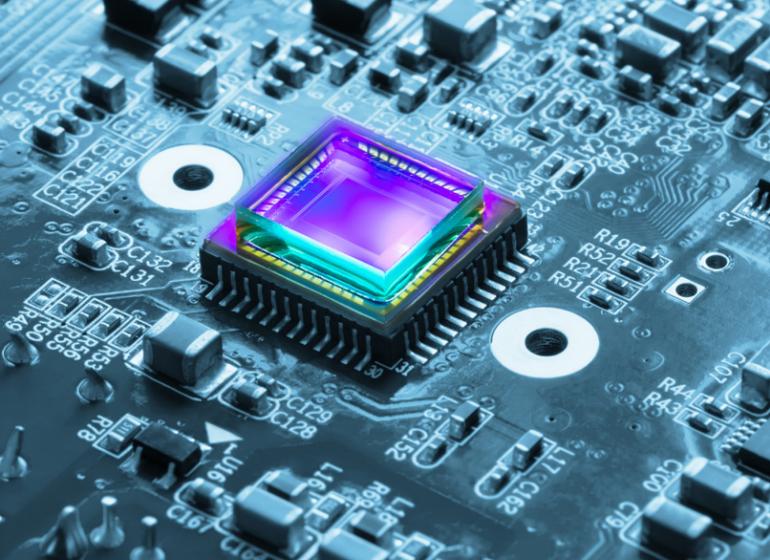
Why Recirculating Chillers?

- For higher heat loads
- Reliable
- High Coefficient of Performance (COP)



Why Thermoelectric Coolers?

- Spot cooling for low heat loads
- Lower cost
- Solid-state construction providing long life and low maintenance



CMOS Sensors

Enhanced CMOS sensor technology enables the capturing of high-resolution images at fast readout speeds for machine vision, weather forecasting, optical character recognition, barcode readers and more.

Thermoelectric cooling will ensure
High image resolution
Capturing of maximum light spectrum



Infrared Range (IR) Sensors

Infrared Range (IR) sensors are used in a variety of applications, including temperature sensing, video surveillance and motion detection. To obtain maximum image quality, IR sensors must be cooled to overcome thermal noise.

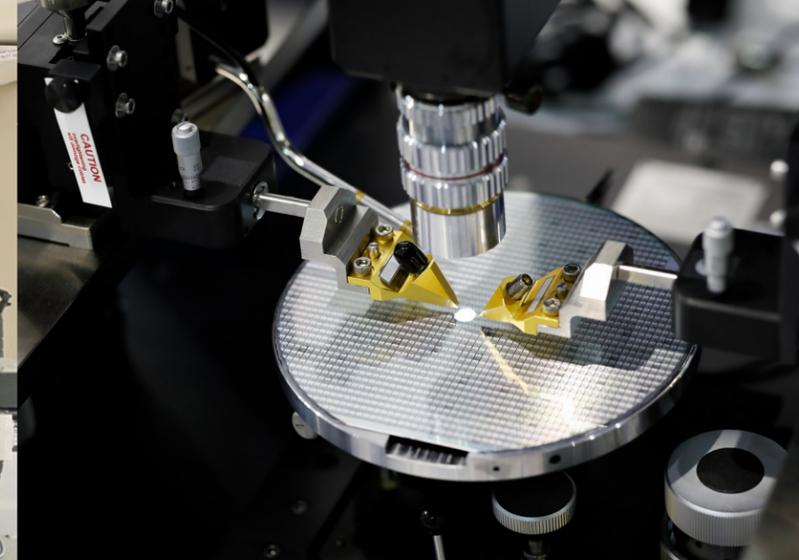
Thermoelectric cooling will ensure
High image resolution
Capturing of maximum light spectrum



Inspection Systems

X-ray inspection can be used for both process and quality control in automated assembly lines. Thermal management is required to dissipate the large amount of excess heat generated by the X-ray tube.

Liquid cooling systems ensure
Long operating life
Maximum system uptime



Semiconductor Test Equipment

Semiconductor test equipment used for quality control is often installed in semiconductor fabrication environments, which is one of the most challenging applications for designing and building liquid based cooling systems.

Liquid cooling systems enable
Maximum system uptime
Stable temperature environment

LAIRD THERMAL SYSTEMS PRODUCTS AND SOLUTIONS

HiTemp ETX Thermoelectric Cooler
Multistage MS Thermoelectric Cooler

Learn more about **CMOS Sensors**

HiTemp ETX Thermoelectric Cooler
Multistage MS Thermoelectric Cooler

Learn more about **Infrared Range Sensors**

Water Heat Exchangers
Custom Liquid Cooling System

Learn more about **Inspection Systems**

Water Heat Exchangers
Custom Liquid Cooling System

Learn more about **Semiconductor Equipment**



Why Thermoelectric Coolers?

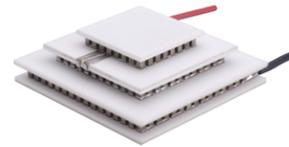
Cool to well below ambient

Withstand high temperatures up to 150°C

Compact form factor

Solid-state construction providing long life operation

Can be placed in vacuum



Why Liquid Cooling Systems?

High heat pumping capacity

Higher efficiencies than air-based heat transfer mechanisms

Precise Temperature Control

High Reliability

Superior heat routing





About Laird Thermal Systems

Laird Thermal Systems designs, develops and manufactures 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.

With unmatched thermal management expertise, our engineers use advanced thermal modeling and management techniques to solve complex heat and temperature control problems. We have more than 50 years of experience in the design, manufacture and servicing of thermal management solutions with millions of installations in operation today.

Contact us for a solution to your next thermal management challenge.

Learn more by visiting www.lairdthermal.com

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