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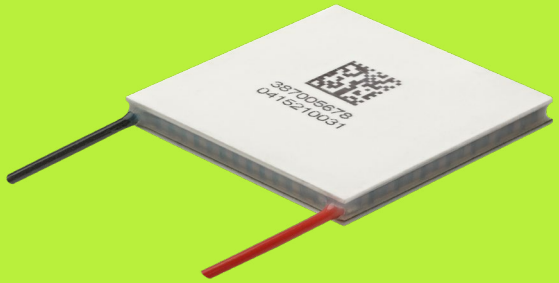
TARK THERMAL
SOLUTIONS

Application Catalog

Thermal Management for

Industrial Applications



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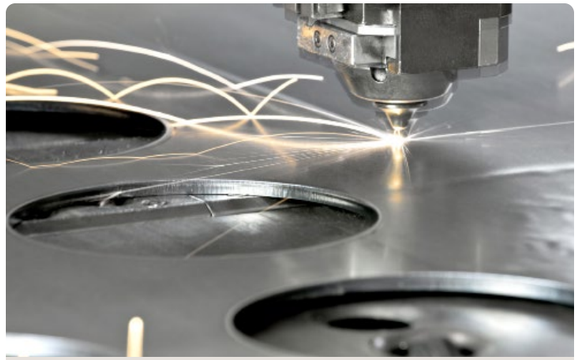
Industrial Applications Cooling

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.

Tark Thermal Solutions 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, micromachining or drilling, industrial lasers generate a significant amount of heat that needs to be managed and quickly dissipated

Temperature stabilization ensures

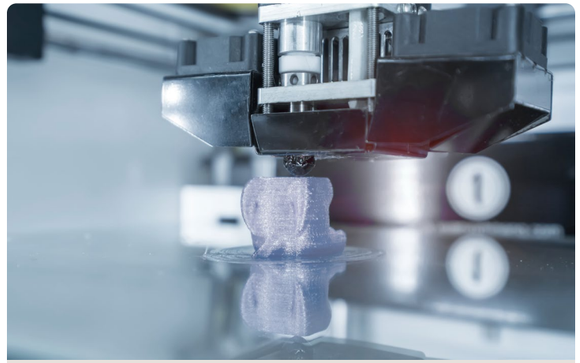
- **Maximum focus**
- **Repeatability**
- **Long-life operation**

Learn more about Industrial Laser

Our products and solutions

Recirculating chillers
- Performance Chiller

Thermoelectric Coolers
- UltraTEC™ UTX Thermoelectric Cooler



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**

Learn more about Additive Manufacturing

Our products and solutions

Recirculating chillers
- Performance Chillers

Thermoelectric Coolers
- UltraTEC™ UTX Thermoelectric Cooler

Laser Projection

Laser projectors used for entertainment applications utilize laser modules to generate highquality 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**

Learn more about Laser Projection

Our products and solutions

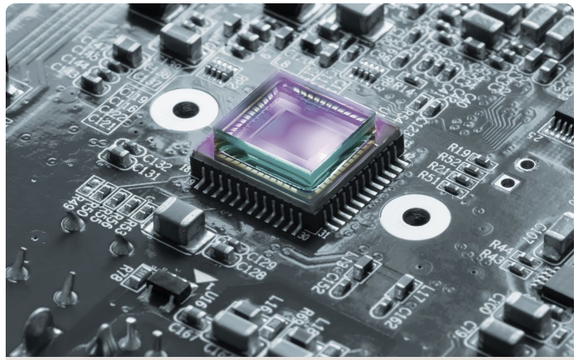
Thermoelectric Coolers
- UltraTEC™ UTX Thermoelectric Cooler

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**

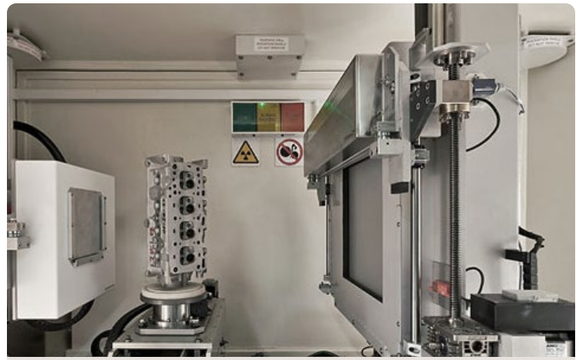
Learn more about CMOS Sensors

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**

Learn more about Infrared Range Sensors

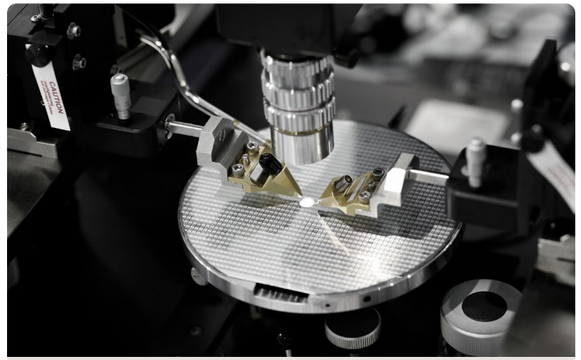


Inspection Systems

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**

Learn more about Inspection Systems



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**

Learn more about Semiconductor Equipment

Our products and solutions

HiTemp ETX Thermoelectric Cooler
Multistage MS Thermoelectric Cooler

Our products and solutions

HiTemp ETX Thermoelectric Cooler
Multistage MS Thermoelectric Cooler

Our products and solutions

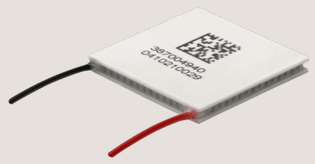
Water Heat Exchangers
Custom Liquid Cooling System

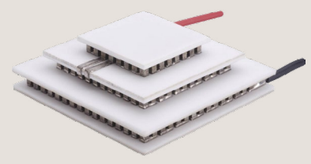
Our products and solutions

Water Heat Exchangers
Custom Liquid Cooling System

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
- Superiour heat routing

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About Tark Thermal Solutions

Tark Thermal Solutions 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.tark-solutions.com