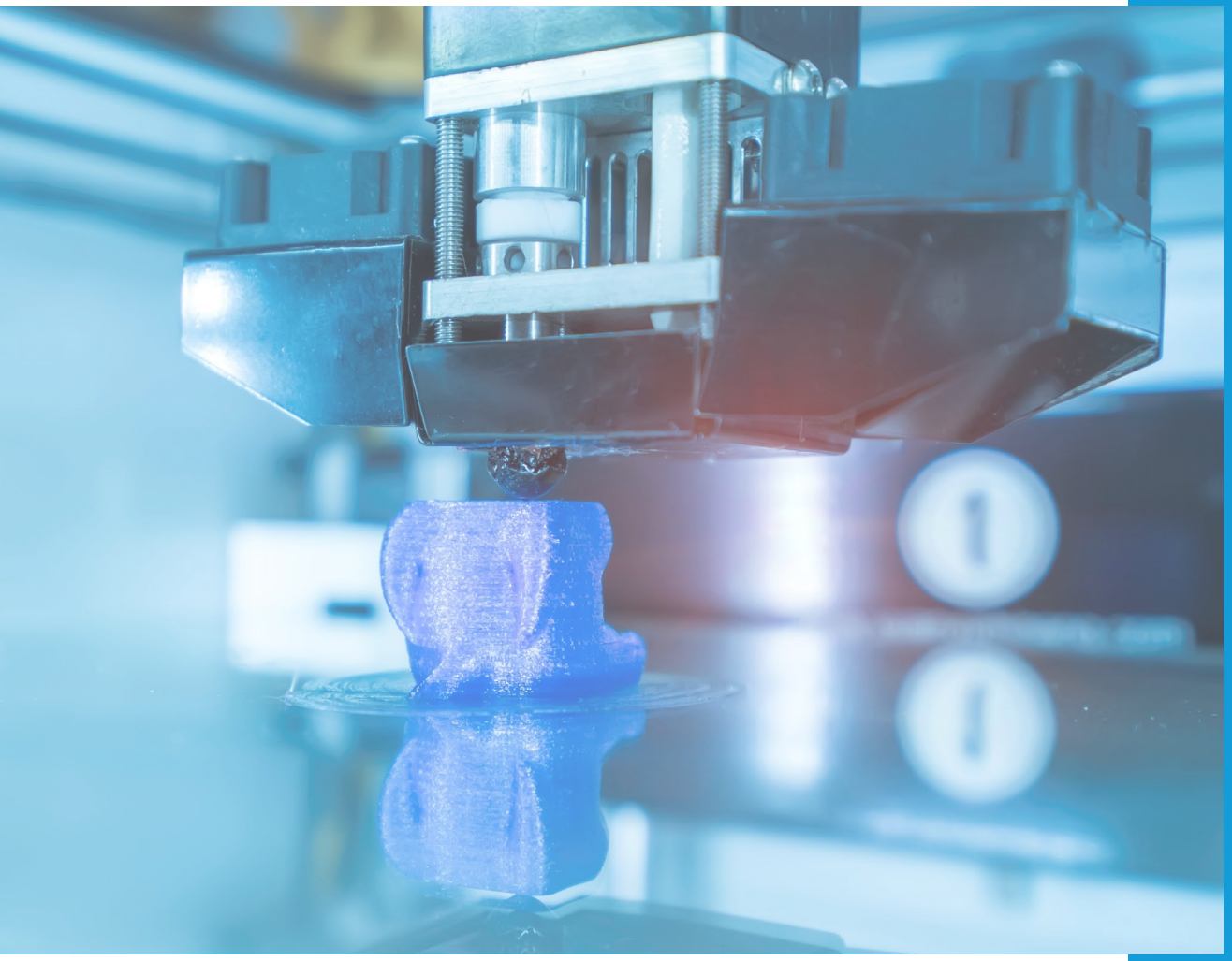
Laird™
THERMAL SYSTEMS

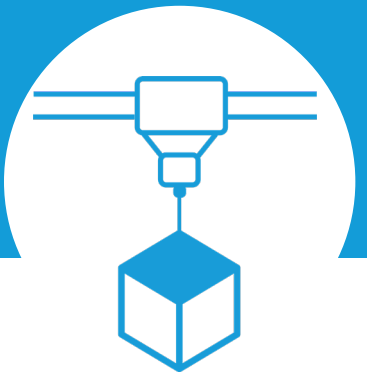


Precise Thermal Management for **Additive Manufacturing**

Introduction

Additive Manufacturing enable

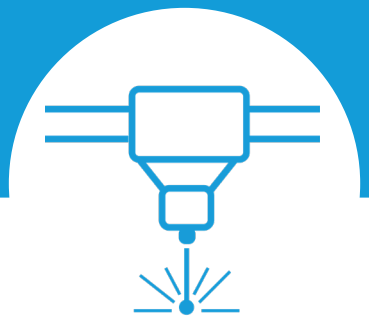
- Rapid prototyping
- Workflow digitization
- Manufacturing of final products



Thermal management is required to

- Cool laser and electronic beam optics
- Cool power source
- Control viscosity of liquid powder

Application Overview



A Laser beam, electron beam, or a thermal heated printhead are used to melt material together and create a 3D object

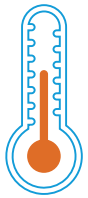
3D Technology Applications

- Medical – casts, prostheses etc.
- Aerospace and automotive - light weigted parts
- Consumer goods

$36.61 Billion

Expected additive manufacturing market by 2025 (up from USD 8.4 billion 2019)

Application Challenges



TEMPERATURE CONTROL

Require stable operating temperature of 20°C ± 0.1°C

POWER CONSUMPTION

Maximizing performance while reducing power consumption

VIBRATION AND NOISE

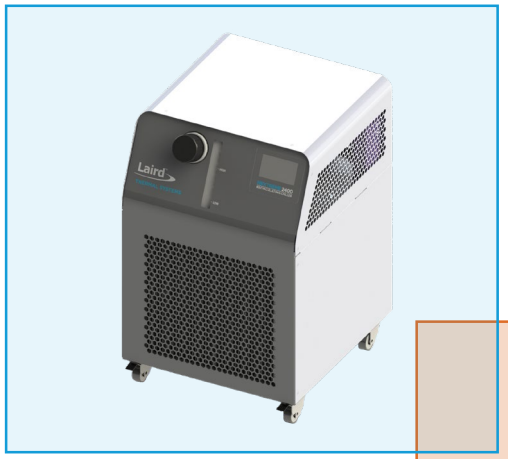
Loud, vibrating machines create dangerous work environment

ECO-FRIENDLY

Governments phase out refrigerants with high global warming potential (GWP)

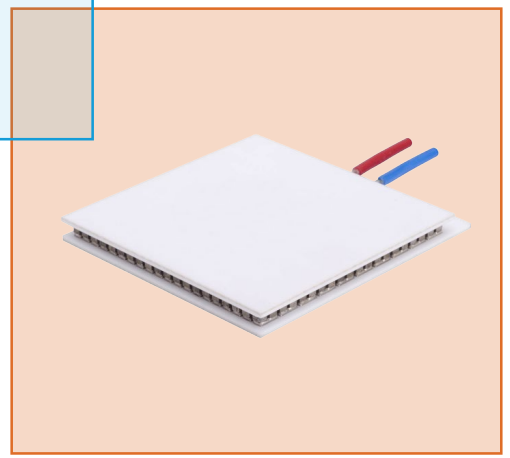
Comparing Cooling Technologies

Compressor-Based Refrigeration Systems



- High Coefficient of Performance (COP)

Ambient Liquid Loop Systems utilizing Thermoelectric Coolers



- Spot cooling of system components

Ability to cool to well below ambient temperatures

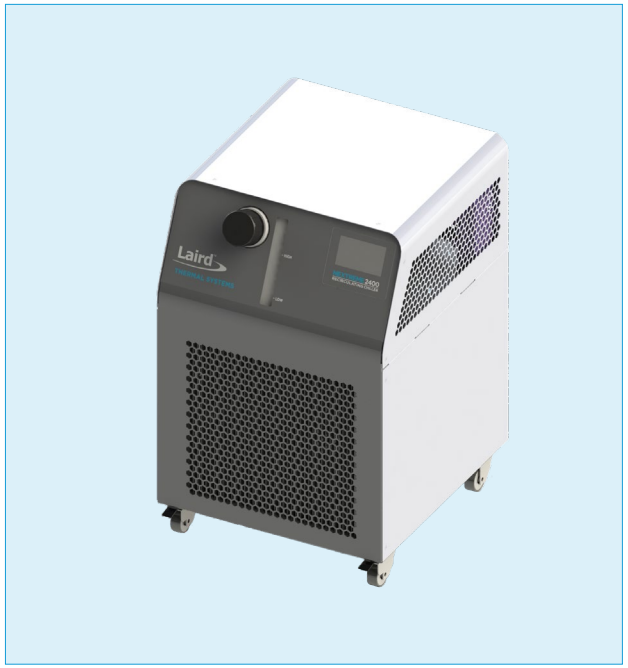
Thermoelectrics in 3D Printers

Laird
THERMAL SYSTEMS

Recirculating Chillers efficiently cool Additive Manufacturing systems

Nextreme™ Chiller Series

The next-generation recirculating chillers



The Nextreme™ Chiller is available in 1550, 2800 and 5000 Watts.

- **Precise Control** — Temperature stability to within ±0.1°C.
- **High COP** — Achieves high COP to minimize power consumption
- **Low GWP** — Half the GWP compared to traditional hydrofluorocarbons (HFC) refrigerants
- **User-friendly** — LCD touchscreen display
- **High uptime** — Maintenance can be scheduled at any time

UltraTEC™ UTX Series

Premium thermoelectric coolers

Precise Temperature Control
Spot cooling allow for precise temperature control

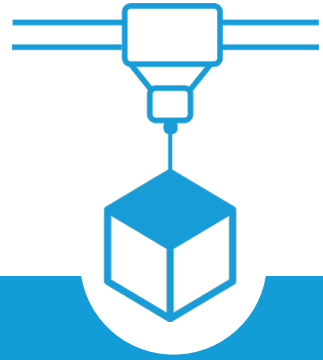
296 Watts Heat Pumping Capacity
Advanced thermoelectric materials for higher heat pumping capacity

(ΔT) up to 72°C
Improved temperature differential with higher thermal insulating barrier

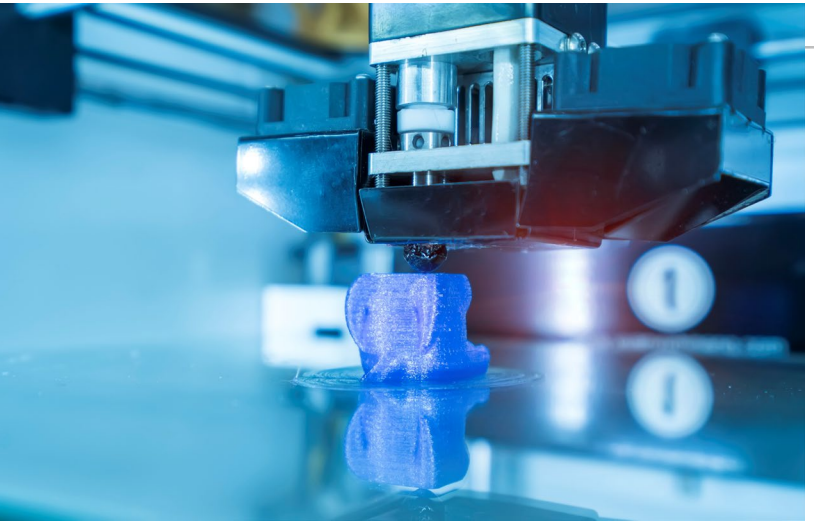
Reliable Solid-State
No moving parts, solid-state Peltier coolers significantly reduce maintenance and total ownership costs.

The UltraTEC™ UTX Series is offered in 13 models.

Conclusion



3D Printers require thermal management solutions for maximum performance



3D PRINTING MACHINES REQUIRE ACTIVE COOLING

Ensures **maximum performance** and **long operating life**

THERMAL MANAGEMENT DESIGN CHALLENGES

Demands for **high performance, reduced energy consumption, environmentally friendly refrigerants**

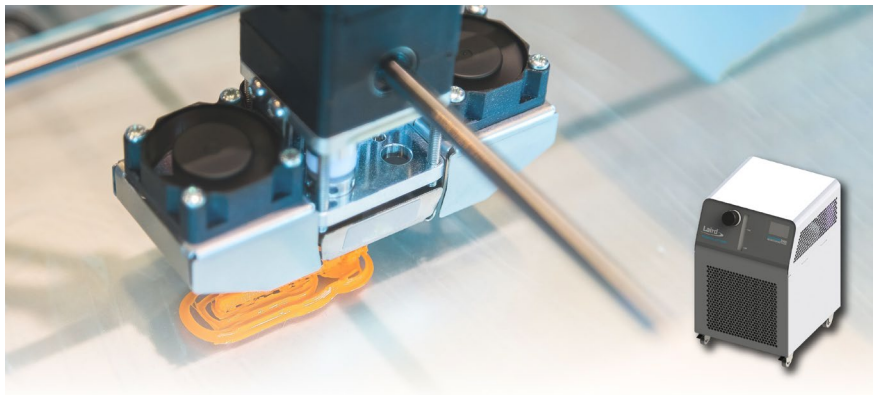
THERMOELECTRICS PROVIDE SPOT COOLING

Reliable and **cost-effective** cooling of components.

NEXTREME CHILLERS OFFER HIGHER COP

For **precise temperature control** of additive manufacturing applications

For More Information



More information on the Nextreme Chiller Series can be found by visiting

https://www.lairdthermal.com/products/liquid-cooling-systems/nextreme-recirculating-chillers

More information on the UltraTEC UTX Series can be found by visiting

https://www.lairdthermal.com/products/thermoelectric-cooler-modules/peltier-utx-series

Read more about precise thermal management for additive manufacturing in our application note

https://www.lairdthermal.com/thermal-technical-library/application-notes/precise-thermal-management-additive-manufacturing

About Laird Thermal Systems

Laird Thermal Systems develops thermal management solutions for demanding applications


Medical


Analytical


Industrial


Transportation


Telecom

DIVERSE PRODUCT PORTFOLIO
Thermoelectric Coolers, Thermoelectric Cooler Assemblies, Temperature controllers and Liquid Cooling Systems

SOLVING COMPLEX ISSUES
Our engineers use advanced thermal modeling and management techniques to solve complex heat and temperature control problems

ACCELERATING TIME-TO-MARKET
We partner closely with our customers across the entire product development lifecycle.

MAXIMIZING PERFORMANCE
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

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THERMAL SYSTEMS

Have a question or need more information about
Laird Thermal Systems? Please contact us via the website at www.lairdthermal.com

Precise-Thermal-Management-for-Additve-Manufacturing-Presentation-021521