ADVANCED COOLING TECHNOLOGIES

The Thermal Management Experts






SOLUTIONS OVERVIEW

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COMPANY OVERVIEW

CLICK TO VIEW COMPANY OVERVIEW >

At Advanced Cooling Technologies, Inc. (ACT), innovation is at the heart of everything we do. Since our founding in 2003, we have been a global leader in thermal management solutions, serving industries that demand precision and reliability, including aerospace, defense, energy, data center, medical, and industrial applications.

Our expertise spans both passive and active two-phase technologies, delivering cutting-edge solutions that address challenges in heat transfer, thermal control, and energy recovery. From developing ruggedized systems for military and aerospace environments to designing environmentally friendly cooling systems for modern data centers, ACT's solutions are tailored to meet the specific needs of our customers.

What sets us apart is our unwavering commitment to Innovation, Teamwork, and Customer Care. With state-of-the-art manufacturing facilities, advanced R&D capabilities, and teams of seasoned engineers, we partner with our clients to drive efficiency, sustainability, and performance.

Whether solving today's toughest thermal challenges or innovating for the future, ACT is your trusted partner for thermal management excellence.

SERVICES WE OFFER

- Thermal & Structural Design & Analysis
- Thermal Management Consulting
- Prototyping & Low-Volume Production
- Product Testing
- Volume Manufacturing
- Spares, Service & Repairs

QUALITY & CONTINUOUS IMPROVEMENT

ACT is constantly improving our quality assurance processes by adopting new techniques and technologies. Our commitment is to achieve the highest quality standards in the industry so we can deliver exceptional products and solutions to our customers.

nqa.
ISO 9001
AS9100
INTEGRATED MANAGEMENT

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17021-1
MANAGEMENT SYSTEMS CERTIFICATION BODY

FACILITY

ACT has over 200,000 square feet of engineering, lab, and manufacturing space, with several unique areas only found in our facilities.

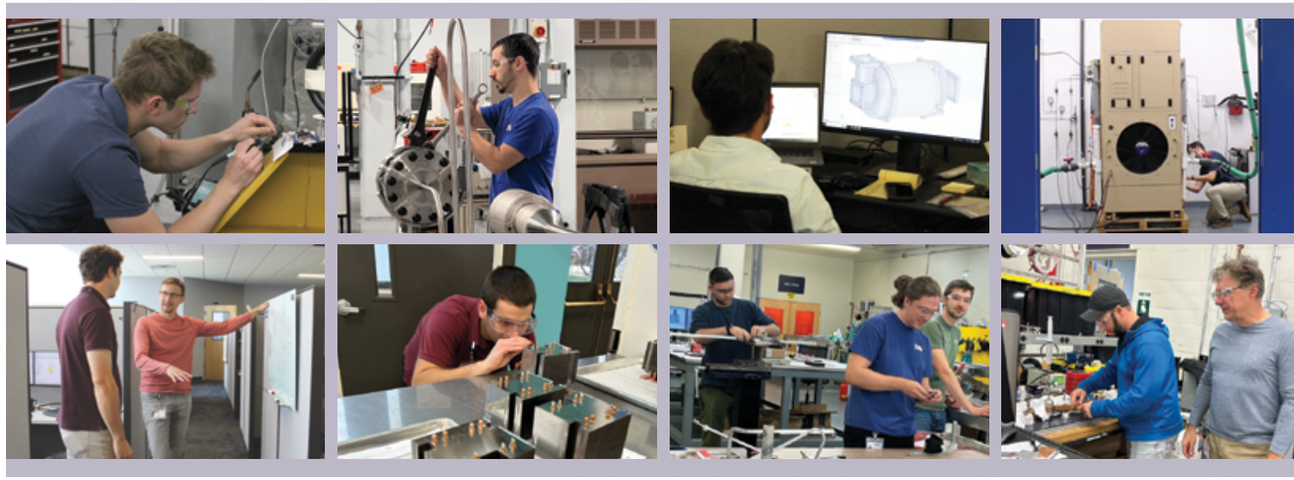
- **Spaceflight Manufacturing:** Highest volume manufacturing in the world for flight-critical constant conductance heat pipes (CCHPs)
- **Facility for Reliably Optimized Server Temperatures (FROST):** Combining R&D and Product Development for next-generation data centers
- **Electrical Engineering Center:** Designing control systems for autonomous operation and energy efficiency across all active product lines
- **Large-Scale Manufacturing:** Delivering industry-leading fielded passive and active cooling systems with unmatched capacity

RESEARCH & DEVELOPMENT

CLICK TO VIEW RESEARCH & DEVELOPMENT >

Research and development have been core competencies of ACT's since our inception and continue to lead our product and market diversification efforts. ACT's research focus areas include a wide range of topics:

- Advanced Spacecraft Thermal Control
- Advanced Heat Pipes
- Pumped Two-Phase Flow
- Custom Cooling Apparatuses
- Combustion and Plasma
- Coatings
- CO2 Capture & Decarbonization
- Advanced Modeling



INDUSTRIES SERVED

CLICK TO VIEW THE INDUSTIES PAGE >

You know your industry best, and we know thermal management best. Together, we can develop industry-leading solutions. Investing in thermal management while developing system architecture gives companies a competitive edge. From reducing energy consumption in data centers to optimizing mass and performance in aerospace applications, ACT develops solutions for your industry's most complex thermal and environmental challenges.

- Space
- Defense
- Aviation
- Energy
- Data Centers
- Medical
- HVAC Energy Recovery
- Power Electronics
- And more

PASSIVE SOLUTIONS

CLICK TO VIEW PASSIVE SOLUTIONS >

Passive thermal management solutions are designed to limit failure points, dramatically increasing the mean time between failure while lowering operational and maintenance costs.

HIK™ PLATES
Efficient heat spreaders: k = 500 to 1,200 W/m-K

CUSTOM LIQUID COLD PLATES
Designed to provide targeted cooling at the board, chassis, or system level.

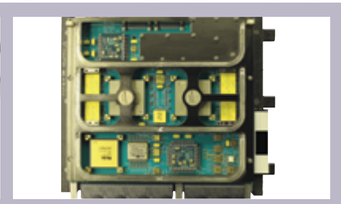
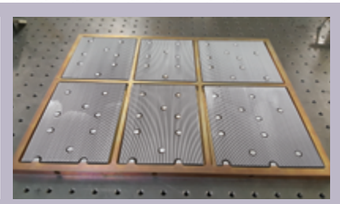
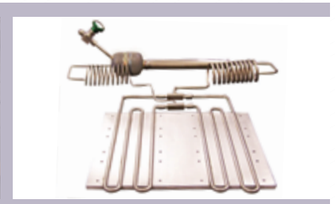
PULSATING HEAT PIPES
Wickless structure utilizes passive two-phase (liquid-vapor) operation to effectively transfer heat.

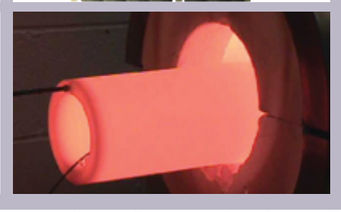
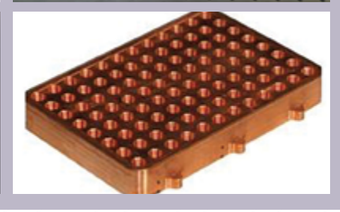
HIGH TEMPERATURE HEAT PIPES
Alkali metal heat pipes, operating between 400° and 1100°C, provide high-temperature heat transfer.

ISOTHERMAL FURNACE LINERS
Specialized insulation liners that maintain uniform temperatures within industrial furnaces.

PRESSURE CONTROLLED HEAT PIPE FURNACES
PCHPs provide temperature stability and control to the milli-Kelvin level.

VAPOR CHAMBERS
Vapor chambers are planar heat pipes that provide exceptional heat spreading capabilities for heat flux of 50 to 1000 W/cm^2.


HEAT PIPES FOR SPACE

CONSTANT CONDUCTANCE HEAT PIPES
Our CCHPs are fabricated to exact aerospace requirements and have over 100 Million hours on orbit.

LOOP HEAT PIPES
Provide long-distance, low-conductance heat transport and temperature control. Optional flex joints and passive switching.

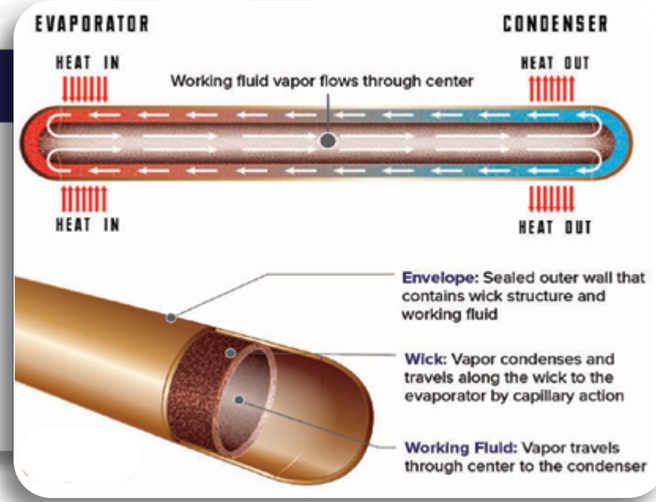
VARIABLE CONDUCTANCE HEAT PIPES
Provide temperature control and means to reduce survival heater power.

SPACE COPPER-WATER HEAT PIPES
SCWHPs offer excellent performance for short-distance, high heat flux transport.

HEAT PIPE ASSEMBLIES

Heat pipe assemblies use a working fluid to transfer heat via capillary action through the evaporation and condensation phase change.

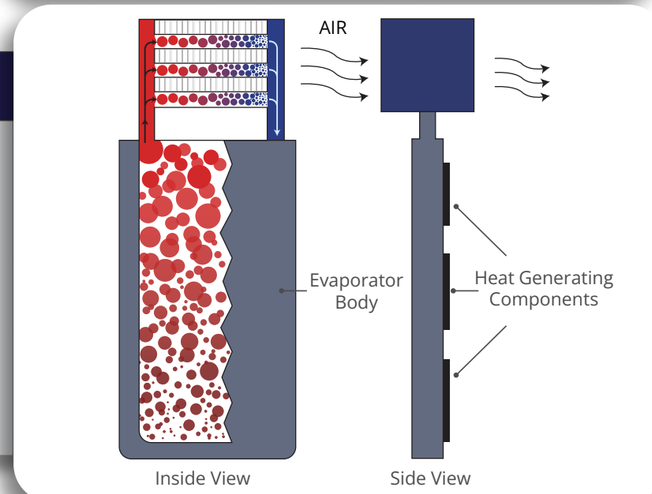
Click to view the Heat Pipe Calculator >



LOOP THERMOSYPHON

Loop thermosyphons are passive, gravity-assisted heat transfer loops that utilize phase changes to transport heat from hot end to cool end.

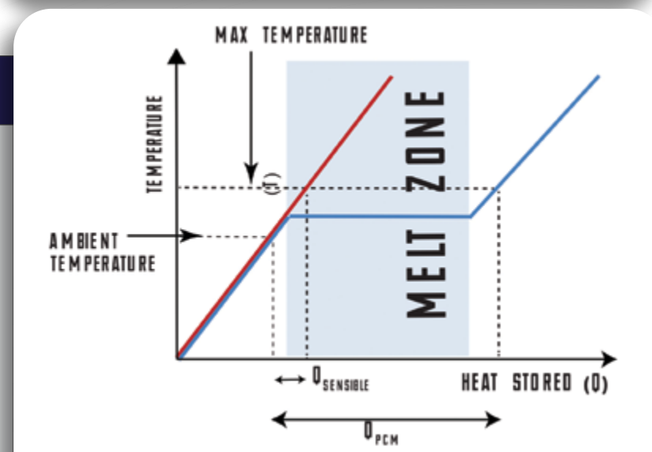
Click to view the Loop Thermosyphon Page >



PHASE CHANGE MATERIALS

PCM Heat Sinks can absorb thermal energy (heat) with minimal temperature rise during the solid-to-liquid phase transition.

Click to view the PCM Heat Sink Calculator >



This graph shows how PCM is used to maintain the temperatures of critical heat-generating components over a given period of time.

ACTIVE SOLUTIONS

CLICK TO VIEW OUR ACTIVE SOLUTIONS >

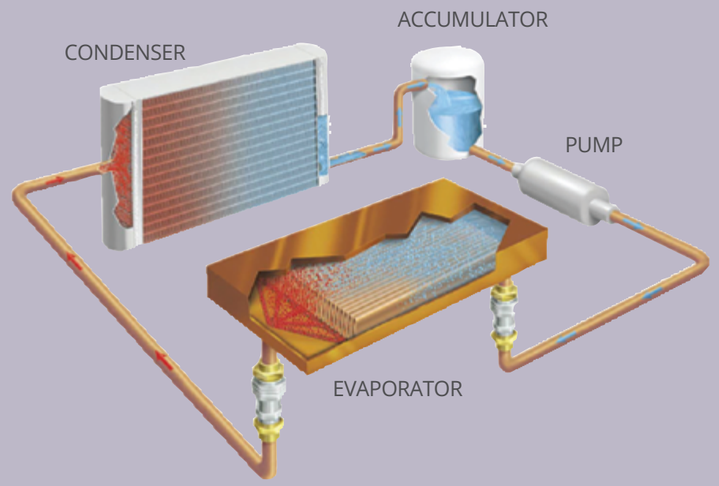
Active thermal management solutions are critical in many high-power applications to maintain safe operation of electronics or cool large spaces that can have a variety of heat loads. ACT designs precision cooling systems that optimize performance and reliability across challenging thermal environments.

PUMPED TWO-PHASE COOLING

Pumped Two-Phase cooling systems transfer heat by evaporation and condensation of a working fluid.

- Increase power density
- Modular and scalable
- 85% reduced energy consumption
- 10 to 200 kW fielded units

CLICK TO VIEW THE P2P LEARNING CENTER >

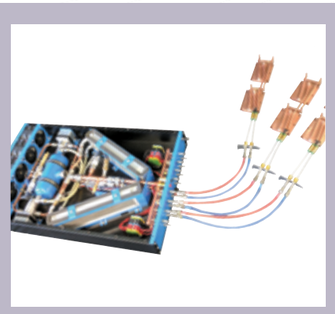


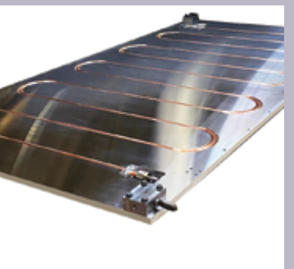
LIQUID COOLING CONTROL DISTRIBUTION UNITS (CDU)

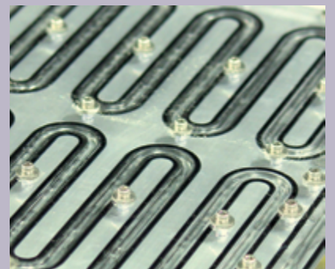
ACT provides turnkey single- or two-phase liquid cooling systems for industrial, data center, and extreme environment defense applications.

LIQUID HEAT EXCHANGERS

Custom liquid-air or liquid-liquid heat exchangers are designed for high performance and compact form factors.




CLICK TO VIEW OUR LIFECYCLE SERVICES >

CHILLERS & ENVIRONMENTAL CONTROL UNITS

TEKGARD

- Horizontal, unitary, and vertical configurations
- Rugged, durable design for harsh environments
- Integrates seamlessly into existing systems
- Active dehumidification
- Heat and cooling settings
- Available in 1 - 12 ton capacities; high capacities possible with additional configurations

CLICK TO VIEW THE TEKGARD® CHILLER PAGE >

CLICK TO VIEW THE TEKGARD® ECU PAGE >

HYBRID ENVIRONMENTAL CONTROL UNITS

VAPHTEK

- Reduce power consumption and cost savings utilizing Pumped Two-Phase mode
- Up to a 70% decrease in power draw when in P2P mode
- Active dehumidification
- Refrigerant side economization protects the conditioned space from contaminants and moture

CLICK TO VIEW THE VAPHTEK™ ECU PAGE >

COOLANT DISTRIBUTION UNITS

- In-rack and end-row data center CDUs
- 15 to 200kW (Proven); scalable to > 1MW
- Single and two-phase operation
- Air or liquid heat rejection

CLICK TO VIEW THE DATA CENTER PAGE >

ALWAYS THERE FOR OUR CUSTOMERS

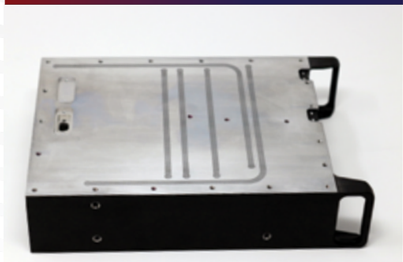
- Field service technicians ready to travel
- Dedicated spares and replacement department

EMBEDDED COMPUTING

CLICK TO VIEW EMBEDDED COMPUTING >

Embedded computing systems act as the brain of a system to execute specific and often complex tasks. High functionality can lead to large power densities, requiring sophisticated cooling systems. ACT provides off the shelf and custom options for both liquid or air-cooled thermal management systems.

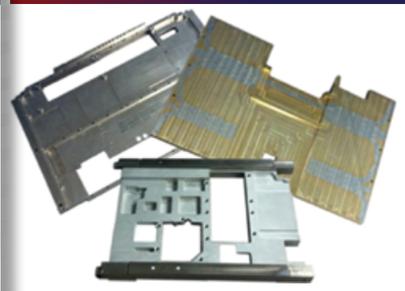
CONDUCTION-COOLED CHASSIS



A conduction-cooled chassis offers the highest degree of reliability, reducing conduction gradients and meeting thermal, mechanical, and environmental requirements.

- No moving parts necessary
- Crucial in harsh environments where air cooling is impractical
- High thermal conductivity to efficiently dissipate heat from electronic components

VME/VPX CARD FRAMES



VME/VPX card frames provide superior thermal conductivity heat spreading, ideal for conduction-cooled or air-flow through systems.

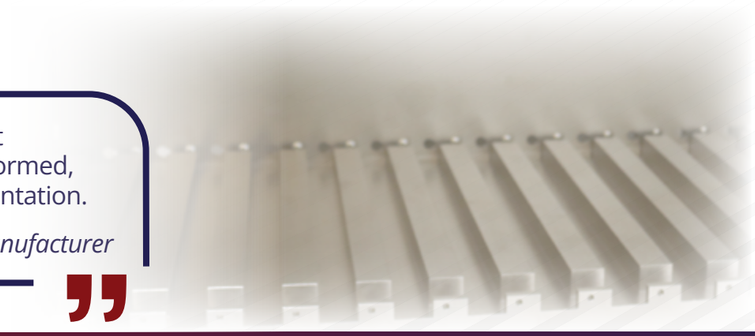
- Scalable; commonly designed in 3U, 6U, and 9U form factors
- $k_{effective}$ > 600 W/m-k
- Proven in lab, factory, and harsh-environment defense and aerospace settings

ICE-LOK® WEDGE LOCK

The ICE-Lok® is the top-performing thermal wedge lock on the market.

- Provides multi-surface mechanical and thermal connection
- 30% lower thermal resistance compared to COTS wedge locks
- Tested in shock, vibration, and TVAC settings

> "Five stars across the board for excellent communication, high quality work performed, on-time delivery, and excellent documentation."
>
> *- Leading Aerospace Manufacturer*



SEALED ENCLOSURE COOLING

CLICK TO VIEW SEALED ENCLOSURE COOLING >

ACT's sealed enclosure cooling systems effectively dissipate heat from sealed electrical and electronic enclosures operating in indoor, outdoor, and other types of environments. ACT develops robust, application-specific cooling solutions that ensure reliable performance across critical industrial sectors, from automation to telecommunications.

HEAT SINK COOLER HEAT EXCHANGER (HSC SERIES)

Part Number	Thermal Capacity W @ 20°C ΔT
ACT-HSC-22:	440
ACT-HSC-45:	900
ACT-HSC-68:	1360

- High-performance, corrosion-resistant, nickel-plated fins
- Few penetrations by cover fasteners, mounting fasteners, and external fan wires create an optimal seal
- Rugged, high-quality construction

HEAT PIPE COOLER HEAT EXCHANGER (HPC SERIES)

Part Number	Thermal Capacity W @ 20°C ΔT
ACT-HPC-15:	300
ACT-HPC-40:	800
ACT-HPC-50:	1000
ACT-HPC-80:	1600

- Optimized for high performance/volume ratios
- Smaller opening footprint on the enclosure wall than the HSC-series
- Dual axial ball bearing fans for years of maintenance-free operation

THERMOELECTRIC COOLER (TEC SERIES)

Part Number	Thermal Capacity W @ 20°C ΔT
ACT-TEC-90:	90
ACT-TEC-300:	300

- No compressors, refrigerants, or circulating liquids
- Great for wash-down/spray-down applications
- Built-in temperature control with an adjustable thermostat

VAPOR COMPRESSION COOLER (VCC SERIES)

Part Number	Thermal Capacity W @ 20°C ΔT
ACT-VCC-1000-DC:	1000
ACT-VCC-2000-AC:	2000
ACT-VCC-3000-DC:	3000
ACT-VCC-5000-AC:	5000

- Harsh Environment Capability (IP55 seal)
- The closed-loop cooling system protects equipment from harsh environments with an adjustable cabinet air temperature

TRY THE ONLINE SELECTION TOOL

Our online selection tool was designed by our engineers to help you quickly and easily select the appropriate cooler for your application.

CLICK TO TRY THE ONLINE SELECTION TOOL >

HVAC ENERGY RECOVERY

CLICK TO VIEW
HVAC ENERGY RECOVERY >

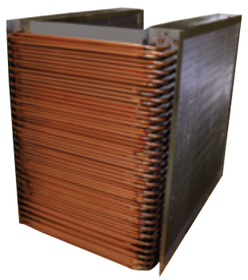
Heat pipe heat exchanger technology from ACT offers an innovative solution for improving energy efficiency and reducing carbon emissions across various industries. ACT delivers next-generation energy recovery systems that outperform traditional technologies, providing unparalleled efficiency and sustainability.

AIR-TO-AIR HEAT PIPE HEAT EXCHANGER (AAHX)

The Air-to-Air Heat Pipe Heat Exchanger (AAHX) uses the air exiting the building (cool in the summer, warm in winter) to either pre-cool or pre-heat incoming outside air.

- Any manufacturable fin height or length
- Side-by-side installation or split up to 30ft
- Vertical or horizontal installation

WRAP-AROUND HEAT PIPE HEAT EXCHANGER (WAHX)



The Wrap-Around Heat Pipe Heat Exchanger (WAHX) is designed to wrap around the active cooling coil of an HVAC system, providing passive heat transport to dehumidify and pre-cool incoming airstream.

- Any manufacturable fin height or length
- Increases AHU's tonnage performance by >25%
- Passive reheat can be 100% controllable
- Payback in under 2 years

SPLIT LOOP THERMOSYPHON

The pump-assisted Split Loop Thermosyphon Heat Exchanger offers the highest levels of energy recovery and cost savings year-round for split airstreams.

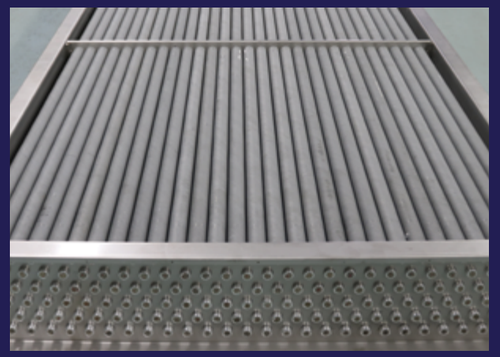
- Any manufacturable fin height or length
- Pumped versions can be split over 300ft apart
- Payback on most projects in under 2 years

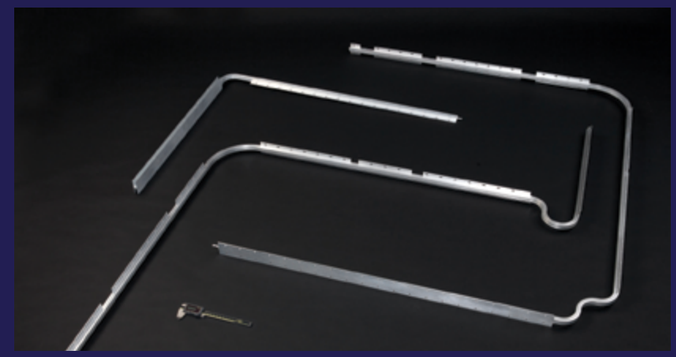
All systems can be corrosion coated with Herasite or Electrofin coatings.

ACT'S HVAC SOLUTION BENEFITS

- ENERGY RECOVERY
- CARBON EMISSION REDUCTION
- NO CROSS-AIR CONTAMINATION
- ENERGY COST SAVINGS

> ACT were very proactive and forward learning in their approach, always willing to work together in a collaborative manner. They were approachable and open with all activities from planning, timescales, designs, risks and testing. I always felt they were very supportive as we discovered technical issues during testing, knowing that they would be there to support the problem solving and get us to the product we needed was excellent.
>
> *-Prismatic*





> Professional attitude, cutting-edge thermal system design capabilities, accommodating to many of the schedule and budget challenges on this particular program.
>
> *- Viasat*

COLLABORATION & PARTNERSHIP

Customer care is at the heart of our approach. We collaborate closely with our corporate partners, offering expert guidance and tailored solutions throughout every stage of product development. Our comprehensive support covers the entire product lifecycle, ensuring your success from initial concept to final production.

PARTNERING WITH YOU AT ANY POINT IN YOUR PROJECT

CONTACT ACT >

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