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Mission, Vision, and Values

Advanced Cooling Technologies, Inc. (ACT) is a premier thermal management solutions company. Under our ISO9001 and AS9100 certifications, we design and manufacture thermal management products for diverse applications including aerospace, electronics, HVAC and energy recovery, and temperature calibration and control. We strive to be the thermal management experts of choice in these diverse markets.

Our diverse R&D and Technical Services programs range from developing thermal protection materials for space reentry vehicles to investigating nanoscale heat transfer in next generation electronic devices to designing high temperature heat recovery systems for industrial processes. Our multidisciplinary technical staff provides customer focused, innovative engineering solutions, as well as advanced research and development services to clients worldwide.

Core Competencies

ACT has a proven track record of developing advanced thermal products for a variety of applications and markets. We actively participate in research and development of emerging technologies in the area of thermal, material science and energy engineering. Our competencies include:

» Design and manufacture of heat pipes, heat pipe assemblies, loop heat pipes, vapor chamber assemblies, cold plates, Hi-K plates and isothermal furnace liners.

» Research and development in emerging technologies including nanoscale corrosion resistant coatings, catalytic reaction, gasification, phase separation and thermal storage systems.

» Experience and capabilities to undertake all phases of thermal product development - design, analysis, prototype fabrication, manufacturing and qualification testing.

» Advanced simulation capabilities for understanding material and thermal interactions from molecular-scale to macroscale.

Brief History

ACT was founded in January 2003 by Dr. Jon Zuo and Scott Garner in Lancaster, PA as a thermal technology R&D firm. By leveraging our experience and strong technological capabilities, we have developed active product manufacturing business, opened many new markets and developed many new customers. Some accomplishment along the way:

» Tibbetts award in 2011 for advanced technical innovation and economic growth via SBIR program.

» Recognized as one the top 50 fastest growing companies in central Pennsylvania: in 2007, 2009, 2010, 2011 and 2012.

» Voted as one of the Best Places to Work in Pennsylvania for 2013.

» The company has been profitable from its inception and has been growing in size and capabilities.

Management and Personnel

The ACT management team consists of individuals with established track records in technology development and commercialization. Throughout their careers, they were involved in pioneering work on heat pipes, loop heat pipes and other two-phase heat transfer devices. Led by President and CEO Jon Zuo, they are the inventors or co-inventors of more than 60 U.S. and international patents and the authors of more than 350 scientific publications.

In addition to our highly recognized management team, ACT retains some of the best and brightest minds in the business. With more than 25 engineers, our technical team has backgrounds in diverse fields including mechanical, electrical, chemical, aerospace, nuclear, materials, manufacturing, and physics. Many of our engineers hold advanced degrees in these fields. Pooling our expertise assures we can serve a wide variety of diverse thermal challenges.

Developed Technologies / R&D

ACT maintains a strong R&D activity which supports the company's diverse thermal product portfolio and simultaneously explores new technologies/applications for expansion of our thermal expertise and product line. These activities are funded by government agencies from SBIR/STTR/BAA programs, industrial customers and internal R&D programs. Technologies developed by ACT over the past several years include:

- Heat pipe-based heat sinks for thermal management: Terrestrial electronics cooling (copper-water), on orbit satellite thermal management (aluminum-ammonia), and high temperature calibration equipment (liquid metal heat pipes)
- Isothermal furnace liners and blackbody cavities: Heat redistribution within a furnace to provide stable, highly uniform temperature profile (within 0.1°C)
- Nanoscale corrosion-erosion resistant coatings: Chemically inert ceramic coatings, which lower the corrosion rate by two orders of magnitude than gold plating.
- Thermal storage: Phase change materials and metal hydrides-based technologies for designing compact heat storage systems
- Pumped liquid cooling: Robust cooling technologies for very high heat fluxes with minimal pressure drop penalty scenarios like cooling of power electronics and computer microprocessors
- Pumped two-phase cooling: Phase change mechanisms (evaporation and condensation) -based absorption and rejection of heat for substantially higher flux performance requirements of military and space thermal control applications
- Phase separation: Momentum-driven vortex phase separators (MVS) for gravity-independent separation and inventory management of liquids, gases and solids within a fluid system; MVS- based direct contact heat exchanger (DCHX) developed for gravity-independent thermal energy transfer
- Thermoelectric cooling: Thermoelectric-based cooling solutions for thermal management of add-on electronic devices in communications and surveillance aircraft
- Advanced heat exchanger: Innovative heat exchanger R&D for varied applications like highly efficient HVAC systems, passive maintenance of chemical reactor outlet temperature, and vapor compression systems
- Advanced modeling technologies: Development of modeling capabilities in the realm of Molecular Dynamics, Ab initio methods, Boltzmann Transport method, Peridynamics for gaining fundamental insights into the thermo-mechanical behavior of high-technology composites, ablative materials, polymers and semiconductor devices

> ACT responded and felt like a team member rather than just a subcontractor. This was appreciated considering the complexity of this program.

MILITARY PRIME COMMUNICATIONS SUPPLIER

Products

ACT is an industry leader in providing custom thermal solutions for a variety of applications in commercial and government markets. We are one of the very few companies that routinely deliver heat pipe products for satellite, terrestrial and high temperature applications.

- Heat pipe and custom heat sinks
- Cold plates
- Constant conductance heat pipes
- Variable conductance heat pipes
- Loop heat pipes
- Heat pipe assemblies
- Hi-KTM plates
- Isothermal furnace liners, blackbody cavities
- Vapor chamber assemblies
- Heat pipe heat exchangers
- Energy recovery systems (HVAC)

ACT provides support for our customers' thermal management needs for all environments and through all stages of their product design cycles.

Services

ACT offers a complete range of thermal & mechanical design, engineering and testing services – everything from initial concept generation to product design to high volume production of a fully integrated thermal management solution – and everything in-between.

Our services include:

- Feasibility studies: Early stage exploration of proposed thermal technology
- Trade studies: Early stage assessment of best suited thermal technology for a project
- Design and analysis: Generation of cost effective thermal designs and analysis using finite element analysis (FEA), computational fluid dynamics (CFD) simulations and custom/in-house heat transfer codes
- Prototyping: Custom thermal management and system prototyping for a range of thermal solutions based on our products
- Manufacturing: In-house volume manufacturing of heat pipes and thermal management devices as per ISO9001:2008 and AS9100 quality standards for military, aerospace and commercial applications
- Product testing: Characterize thermal products vs. performance targets applicable standards or competitor products

Our experienced engineering team and leading edge technology developers enable us to offer a broad range of services at a consistently high quality level.

Markets/Customer

We serve customers in diverse markets including aerospace, electronics, automotive, avionics / aircraft, LEDs, material processing, HVAC and energy recovery, and temperature calibration and control. Our products provide reliable thermal management for electronics, biomedical, aerospace, HVAC, and other sophisticated devices on the ground, and in the water, air, and space. Our customers include:

Government:

» National Aeronautics and Space Administration (NASA)

» Department of Defense (DoD) - Defense Advanced Research and Project Agency (DARPA), Army Research Laboratory (ARL), Naval Air Systems Command (NAVAIR), Missile Defense Agency (MDA), Office of Secretary of Defense (OSD)

» Department of Energy

» National Science Foundation

Industrial/commercial:

» Bell Helicopter

» Boeing

» ITT Exelis

» Lockheed Martin

» Northrop Grumman

» Orbital Sciences Corporation

Core Advantage

ACT's customers can benefit from our:

» Unrivaled heat pipe product experience

» Diverse R&D and technical capabilities, ITAR compliance

» Strong focus on customer satisfaction

» Manufacturing, quality systems certified to AS9100 and ISO9001.

» Manufacturing, testing capabilities for terrestrial and aerospace heat pipes (> 40,000 ft2 facility)

» Expertise in engineering design, analysis as well as advanced modeling techniques

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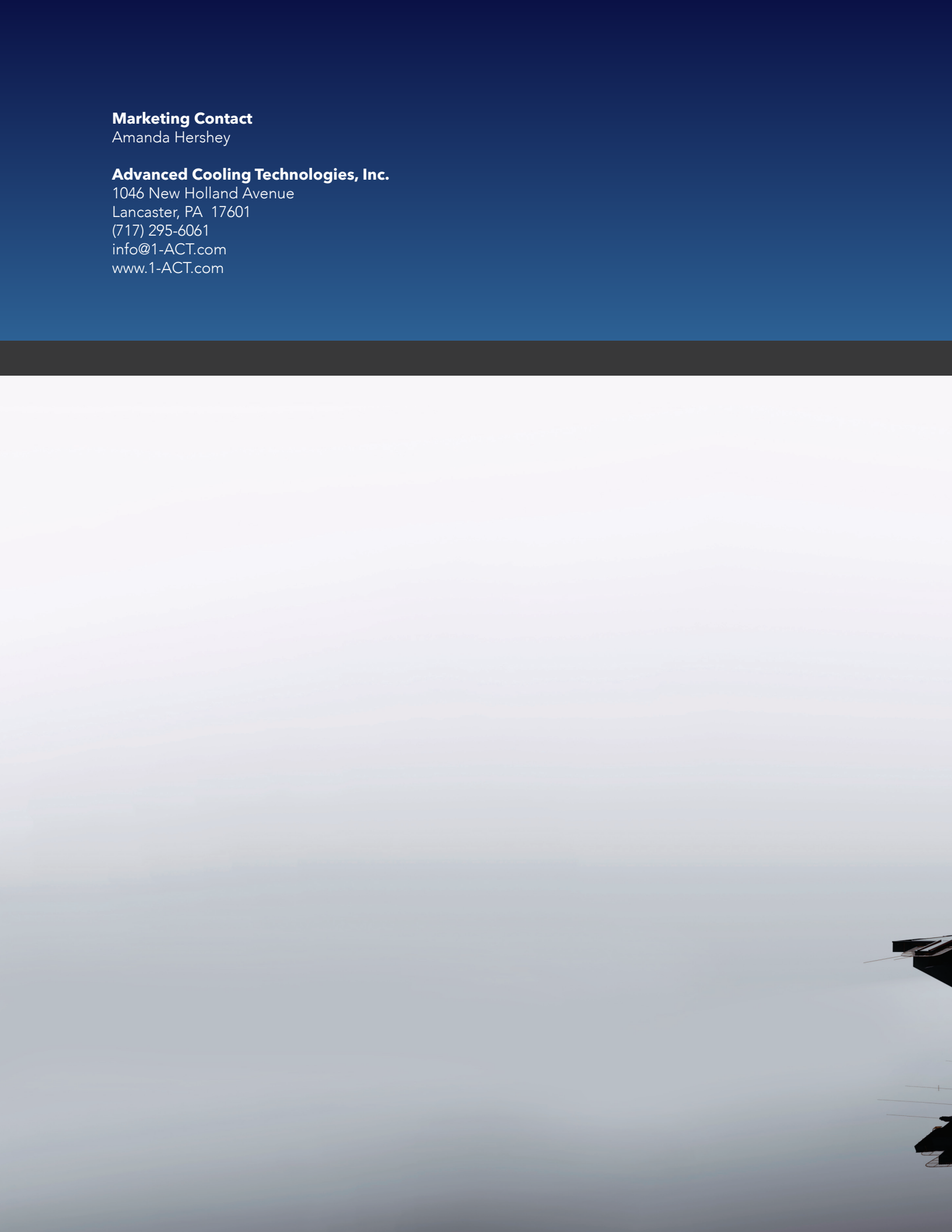

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