

CASE STUDY

Cooling Data Centers

The demand for higher processing power at data centers is fueling the need for architects and data center managers to seek out improved cooling strategies that boast enhanced energy efficiency. Armacell's portfolio of insulation products can provide innovative relief to cooling systems, even on roof-tops, in this fast-paced, digital industry.

Armacell in action.

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 **armacell**[®]
ArmaFlex[®]

Energy Efficiency: Front and Center



Deep in what is known as “Data Center Alley,” a global data center, colocation and peering services provider acquired over 120 acres in Virginia to build a vast, multi-building data center campus. This ongoing, multiple structure expansion project with over 500,000 square foot of space and thousands of feet of refrigerant piping needed to be energy-efficient as these facilities boast a low power cost and LEED® Gold and Silver Sustainability certifications. HITT Contracting, Insul-Tech, Inc. and W.E. Bowers, who were awarded the project, knew they would need an exceptional, energy-efficient, insulation product for the refrigerant lines used to cool the data centers and equipment. The move-in ready buildings each house seven pods and the pods are built out as the data center needs more. Having a concentration of servers, switches and racks in one building, can cause heat to build up and create cooling and power density¹ issues. By insulating cooling systems with Armacell’s closed-cell, thermally efficient foam products, data center managers can improve sustainability and reduce operational costs. “Data center systems insulation projects represent a challenging, new space for Armacell. By having our

Project:

A global data center, connectivity and cloud services organization undertakes construction on a new multi-building campus which includes advanced cooling system lines that need insulation that can withstand the elements and provide exceptional energy efficiency.

Location:

Virginia, USA

Insulation Contractor:

Insul-Tech, Inc.

Mechanical Contractor:

W.E. Bowers

General Contractor:

HITT Contracting

Challenge:

Insulate hundreds of thousands of linear feet of refrigerant pipe situated in tight quarters on roof tops and in buildings within a short project timeline.

Solution:

Install 1 inch thick AP ArmaFlex Black LapSeal in tube form and AP ArmaFlex in sheet form for its easy-to-install nature, (especially in constricted spaces) and product longevity.

Did you know that data centers can use **75% more cooling power than actually required? Installing insulation systems on equipment can significantly reduce this waste.**



products optimally performing in a market segment where innovation, technology, and efficiencies are on the forefront is very exciting,” remarked Kent Stapleford, Eastern Regional Sales Manager for Armacell. Too often, Armacell products are buried within an old specification for a mechanical system. This project is a true testament of our material evolving in conjunction with U.S. and global megatrends that will shape our future.”

FIRST CLASS SOLUTION

HITT Contracting is a national commercial construction leader and ranked one of the top 50 largest general contractors in the U.S. For this project, HITT collaborated with Insul-Tech and W.E. Bowers, who have partnered in the critical facilities construction arena for many years. These principal partners work hand in hand and have solid experience working on high profile, fast-paced project builds. W.E. Bowers brings with them the understanding of how their customers operate and manage projects, which is a vital aspect to an insulation contractor like Insul-Tech. This deep knowledge allows an insulator to complete their scope of work on time and under budget, while setting up the groundwork for future successes.

HACKING PROJECT CHALLENGES

Each of the new buildings in this ongoing construction project housed data center cooling systems and refrigerant piping on roof tops. Each building had over 175,000 linear feet of piping and the team estimated that would require over 400,000 feet of Armacell insulation to complete. Our contractors knew this project would be a challenge due to the sheer volume of the prefabricated refrigerant piping racks needing insulation. The installers were also working in tight areas due to the piping being clustered closely together on the racks so it was important for Insul-Tech to use a product that could be installed easily in small spaces without quality concerns. “When you are working in areas with minimal space at a critical facility, the job needs to be done correctly – the first time – we cannot have a problem due to material quality. There is no room for

error as once those areas are insulated and covered up, we cannot go back into them, so product selection and installation is crucial,” remarked Matt Stillitano, Vice President at Insul-Tech, Inc. By using ArmaFlex Black LapSeal on this project the contractors could reduce the total installation time due to the speed of applying tubes with a self-sealing, secure lap seal adhesive closure. The construction teams, contractors and insulators worked together diligently and even though this large project had difficult site constraints and weather delays, the team overcame these issues, delivering on budget and on schedule.

DECODING INSULATION SOLUTIONS

The most common air-based cooling methods for data centers utilize HVAC systems to support “cold aisle/hot aisle” orientation which involves facing the cold sides of each server cabinet away from the hot sides of the next row of servers and blowing cooled air into the room. Another method uses “Hot Aisle Containment” or “Cold Aisle Containment” where either the hot aisle air or cold aisle air is enclosed and captured, turning the rest of the room into a return air plenum. Other types of cooling systems besides air-based are legacy floor-based cooling, traditional evaporative cooling, or liquid-based methods, the latter having a recent increase in popularity for data center managers. In one type of liquid-based cooling method, water flows through chilled pipes and cooling tower pumps which cool the hot side of the cabinet to decrease the temperature. The one thing all of these cooling methods have in common is the need for proper insulation to control costs and drive energy efficiency. Stillitano knew the importance of choosing the right product. “For us there was never a discussion to use a different brand of insulation,” said Stillitano. “We have a partnership with Armacell and they are a key part to Insul-Tech’s success. We are confident that their products will last over time.” Armacell’s ArmaFlex® closed-cell foam insulation is a rubber-based flexible material ideal for insulating chilled water piping, refrigerant piping, chillers, cooling tanks, air handling units and ducts. Insulating a system

not only promotes energy efficiency, but it also prevents condensation on below-ambient temperature surfaces—a critical issue for data center management. Specifying ArmaFlex for data centers is a smart move. Armacell uses a fiber-free, formaldehyde-free, low VOC formulation for its foam insulation, which makes it an excellent choice for data center environments, eliminating particulates that can damage sensitive servers. Its closed-cell structure prevents moisture ingress and naturally resists the growth of mold and mildew due to the included anti-microbial, MICROBAN additive. The flexible nature of elastomeric insulation means it installs easily in tight spaces around pipes or inside walls or ceilings. You can count on ArmaFlex insulation retaining its thermal integrity over time, lasting well into the digital age. ■

1. Power Density: The amount of equipment you can put in a room before it gets too hot or you run out of power.

For more information visit:
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Insulation for Information Management

- Durable, low-profile LapSeal with wider release tab for quick and easy application
- ASTM E 84 25/50 rated up to 2" wall
- GreenGuard Certified
- Fiber-free, formaldehyde-free, low VOC and non-particulating formulation protects indoor air quality
- Microban® antimicrobial product protection inhibits the growth of mold and mildew on the insulation
- Closed-cell foam structure prevents moisture wicking and eliminates the need for additional vapor retarder

All data and technical information are based on results achieved under typical application conditions. It is the customer's responsibility to verify if the product is suitable for the intended application. The responsibility for professional and correct installation and compliance with relevant building regulations lies with the customer. By ordering/receiving product you accept the Armacell General Terms and Conditions of Sale applicable in the region. Please request a copy if you have not received these.

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ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,100 employees and 24 production plants in 16 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.

For more information, please visit:
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800-866-5638

