

ARMACELL SOLUTIONS

Office/Mixed-Use

Office/mixed-use developments are properties that marry residential and commercial spaces. They may include apartments or condos along with commercial office space, shopping or restaurants. These distinct uses propose HVAC and energy challenges for building designers. Armacell has energy-efficient insulation solutions designed with mixed-use construction in mind.

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MAKING A DIFFERENCE AROUND THE WORLD



OFFICE/MIXED- USE SOLUTIONS

As society continues to adopt high efficiency and standard-of-living philosophies, mixed-use construction projects become an increasingly attractive development endeavor. Although their origin dates back to ancient times, rising land costs in “24-hour” cities promoting high-growth populations create new challenges today that can stress even the most advanced technologies and design. Whether mixed-use developments are driven by private or public enterprise, the implementation challenges remain similar.

Creating a condensed environment where individuals, families, work colleagues, and neighbors can live and work comfortably provide specific challenges when designing climate controlled spaces. While baseline HVAC and plumbing technologies are readily available, controlling the efficiency of these technologies, while accounting for space constraints and multi-use requirements, bring significant challenges to the forefront of design.

POPULARITY AND TRENDS

The demand for mixed-use facilities can be accounted for by their attractiveness to STEM-focused cities garnering economic investment from large technology companies and publicly funded research groups. More specifically, impetus on building mixed-use facilities can be seen as a symptom of even larger trends, such as urbanization and energy efficiency. As mixed-use construction projects grow in size they employ more and more ducting

WALKABILITY

and close proximity to work are driving

MIXED-USE

building trend.

Millennials and boomers alike say they prefer a walkable community.



and plumbing, which in turn requires increased reliability and consistency, to satisfy the increased demand on larger populations operating within a smaller physical footprint.

Relaxation of mixed-use zoning regulations and STEM-focused jobs are bringing people back to living in cities, as opposed to more rural areas. Creating spaces where hotels, restaurants, retail businesses, and residential apartments exist in harmony means that we have begun shifting our lives from enduring long commutes and storied shopping experiences to immediate deliveries and rapid mass transit. With these transformative shifts in our living and working experience comes advanced design techniques and technologies for managing the acoustic comfort, indoor climate, and resources of legacy HVAC and plumbing systems.

HEATING/COOLING METHODS

Heating and cooling challenges within mixed-use buildings are numerous. Vertically and horizontally oriented building designs create distinct design challenges. Although heating and cooling requirements will vary per building and room in mixed-use design the end-goal of meeting efficiency and space requirements, while maintaining sustainable growth of the neighborhood, is paramount. A building may be required to operate with a



particular program during the day and then an alternate setting at night.

Mixed-use buildings could require a number of heating and cooling solutions operating as an integrated system. Within the same building, a condenser water system could service residential floors via water-source

heat pumps with VAV (variable air volume) in the office floors. Additionally, VRF (variable refrigerant flow) could be used to cool hotel floors while the resultant hot and cold water is used to heat and cool the lobby area via radiant technologies. A top priority for mixed-use building design is management and reliability of these systems. Simplicity in design, ease of installation, and immediate access for operational maintenance remain areas of particular importance.

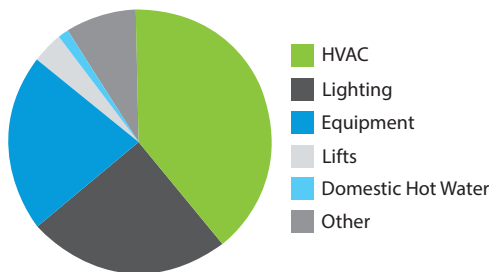
Given the increased usage of varied ducting and plumbing within vertical mixed-use structures, issues of moisture intrusion can reach unmanageable levels during operation if not properly accounted for. If, for instance, insulation gets wet then that moisture could lead to mold problems that may go undetected for months or even years simply as a result of the physical constraints of the construction envelope. Additionally, refrigerant piping is a constant culprit for condensation build up and even refrigerant leaks over time. As this piping traverses the inner workings of a multi-use building, the risk of moisture damage increases exponentially. Designing a system with the most protective insulation barrier is insurance any designer can afford.





As mixed-use buildings are filled with dozens of different air-conditioning technologies, it is safe to assume that the noise from the fans and blowers inherent to these technologies will bring along unpleasant noises and acoustic ailments.

HVAC RANKS AS #1 IN ENERGY USE IN TYPICAL OFFICE BUILDINGS



While insulation can be used to preserve air quality and temperature, the acoustic benefits should not be taken for granted in designs mitigating confined spaces. For example, air-handling units cooling a restaurant require specific acoustic conditioning to maintain the acoustic comfort of occupants in an adjoining hotel floor. Lining and wrapping ductwork with closed cell insulation helps manage audio frequencies specific to air-handlers and potential microbial growth common to open-cell insulation types.

INNOVATIONS

It is important for designers to take note of the increased popularity of mixed-use buildings. Innovation will be required to

manage the residual effects of increased population density and resource demand in these facilities. Topics like passive fire control, uniform equipment systems, and increased integration of dissimilar technologies already present opportunities for innovation in the mixed-use design of today. As custom HVAC and plumbing solutions become increasingly sought after, designer reliability and consistency will become an increasingly important standard by which these facilities are developed.

LEED® certification is increasingly popular. While it is a benefit for building owners and tenants, demanding limitations will be placed on technology selection and implementation. Appropriate selection of materials and equipment that qualify buildings for LEED certification is necessary if an owner wishes to achieve long-term durability and lower maintenance costs. Insulation systems should provide both of these things. At Armacell, we are innovating for a better future.

INSULATION DESIGNED FOR THE CHALLENGES OF MIXED-USE BUILDING APPLICATIONS

The one thing all of these design variables have in common is the need for proper insulation. Armacell's insulation systems are ideal for insulating chilled water piping, chillers, cooling tanks and air handlers. Insulating pipes, refrigeration lines or cooling systems not only promotes energy

efficiency, but it also prevents condensation on below-ambient temperature surfaces — a critical issue for mixed-use facilities and communities.

Specifying Armacell Solutions for commercial offices and mixed-use buildings is a smart move. Armacell uses a fiber-free, formaldehyde-free, low VOC formulation for its foam insulation, which makes it an excellent option for any environment, eliminating particulate that can jeopardize air quality and equipment. Closed-cell structures also prevent moisture ingress and naturally resist growth of mold and mildew. Most importantly, the flexible nature of Armacell's insulation means it installs easily in tight spaces in floors, walls or ceilings. You can count on Armacell insulation retaining its thermal integrity over time, lasting well into your future. ■





OFFICE/MIXED-USE BUILDINGS RELY ON OUR PROVEN SOLUTIONS

PROJECTS WON

- **451 Tenth Avenue Apartment/Office Building - Phase 1** – New York, NY
- **511 E 86th St Apartments/Mixed-Use** – New York, NY
- **ASHRAE's New Global HQ** – Peachtree Corners, GA
- **Bulletin Building/One Drexel Plaza** – Philadelphia, PA
- **CalSTRS Headquarters - Phase 2** – West Sacramento, CA
- **Centene Healthcare Headquarters & Parking Garage - Phase 1** – Charlotte, NC
- **Centene Healthcare Headquarters - Phase 2** – Charlotte, NC
- **Duke Energy Tower Charlotte** – Charlotte, NC
- **FedEx Logistics Headquarters Office** – Memphis, TN
- **First National Bank Tower Charlotte HQ / Mixed-Use Development** – Charlotte, NC
- **HQ2 - Amazon - Tower 1 & 2 Mixed-Use** – Arlington, VA
- **JP Morgan Chase Office Building** – Plano, TX
- **Kiewit Regional Offices HQ - Phase 1** – Lone Tree, CO
- **L L Bean Corporate Headquarters** – Freeport, ME
- **MassMutual Life Insurance Office** – Boston, MA
- **Microsoft Offices at Atlantic Yards** – Atlanta, GA
- **One Santana West Office Building & Parking Garage - Phase 1** – San Jose, CA
- **Pegatron Corporation** – Ciudad Juarez, Mexico
- **Promega Corporation R&D Building** – Fitchburg, WI
- **Puma HQ @ Assembly Row Offices/ Retail/Garage - Block 5 - Phase B** – Somerville, MA
- **Rosemary 360 Office Building @ Rosemary Square** – West Palm Beach, FL
- **Three Ballpark Center** – Cobb, GA
- **Uptown 500 Apartment/Retail/ Restaurant & Parking Garage** – Wheeling, IL
- **Wolf Point South Tower B / Salesforce Tower** – Chicago, IL
- **Wyoming Life Resource Center** – Lander, WY

SMART SOLUTIONS FOR YOUR BUSINESS

Armacell's Solutions Portfolio groups insulation products into comprehensive packages aimed at making the specification of the right insulation for mechanical systems easier than ever before. Mechanical engineers, insulation contractors, building owners, or distributors can easily identify the best insulation products for use in an air plenum, on HVAC/R mechanical piping, chilled, or plumbing – the key places where insulation is critical to the performance of the equipment. Packages offer two levels of cost and service: High and Superior Performance with a 10- or 15-year warranty.

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 inventor of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal 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 more than 3,300 employees and 27 production plants in 19 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for acoustic and lightweight applications, recycled PET products, next-generation aerogel technology and passive fire protection systems.

For more information, please visit:
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