

Dyplast products

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meTECNO Benchmark ARCHITECTURAL SYSTEMS

Teamwork: U.S. Postal Service Center



*Philadelphia Mail Processing and Distribution Center
(Photos courtesy of ©Damianos Photography)*

Architectural Insulating Panels

Architectural Insulating Panel Systems utilize lightweight, insulating foam cores with steel or aluminum faces integrally bonded to each side. Architectural Insulating Panels form a high-strength structural building unit for walls, ceilings, or floors that can be readily attached to a standard steel frame construction grid. These composite building units can be designed to meet the most demanding specifications for strength, flexibility, and thermal control (up to R48) - - while providing a broad array of architectural colors and textures.

Architectural Insulating Panel Systems are an economical alternative to metal clad buildings with batt insulation, insulated concrete forms, or tilt-up construction. Not only do installed costs rival other methods of construction, the long-term energy savings make Architectural Insulating Panels the life-cycle cost winner.

Architectural Insulating Panel Systems offer superior thermal control, dramatic energy savings, low maintenance, durability, good looks, flexible design, and easy installation.

The Project and Our Ultimate Clients

When the exterior wall cladding of a 10,000 square foot building fails due to blisters or adhesion, it's a problem. When the same type of failure occurs on a government building 100 times larger, it's a catastrophe. To make sure there weren't any failures in the future of Philadelphia's new \$165 million mail processing and distribution center, the project's architect relied upon laminated polyisocyanurate insulated metal panels with a proven record of performance from Metecno-Benchmark Architectural Systems. Benchmark required over 100,000 board feet of polyisocyanurate foam sheets for the Philadelphia Distribution Center and selected ISO-C1 from Dyplast Products as the insulation of choice.

The 930,000 sq-ft U.S. Postal Service Processing and Distribution Center sits on a 50-acre site located in southwest Philadelphia's Eastwick section and is accessible to nearby Philadelphia International Airport and Interstate 95. The USPS facility processes 8 million pieces of mail daily in its 630,000 square foot, split level workroom. To get the mail in and out as quickly as possible, the facility has more than 100 loading and unloading docks, located on the sides and along the back of the workroom, and uses the latest in high speed sorting technology.

The building is of a style the architect calls "Soft Industrial" and uses smooth-faced insulated metal panels and generous amounts of glass to create an office-look. The smooth faced insulated panels are primarily used on the public face of the building, where offices, support spaces and the primary employee entrances are located. The rest of the building, which is essentially a massive square box, is clad with deep-ribbed metal wall panels. The chosen profile was MeTecno-Morin Corp's MR-36 panel, using Dyplast Products ISO-C1 polyisocyanurate insulation.

Benchmark's Engineering department had early involvement in the design stage and was able to marry the window and walls as an integrated system and develop a total systems approach to the exterior cladding. The wall panels selected were Benchmark's Designwall 2000H that can be produced in standard 1 to 24 foot lengths and constructed from either steel or aluminum. These smooth-surfaced panels feature a double-gasket shiplap joint that maximizes thermal efficiency and creates a double barrier against air and water penetration. The panels have 20-gauge exterior faces and are finished on the exterior side with two coats of paint. These insulated panels are available in a standard thickness of 2 or 3 inches, but in the case of the USPS facility a custom 3 ¼ inch was required to accommodate the strip widows. In order to meet the required tolerances, Dyplast fabricated sheets of polyisocyanurate foam up to 24 feet in length with a height tolerance of +1/32 inches and 1/8 inch tolerance on the width and length. These tight sheet tolerances enabled Benchmark to manufacture metal skin panels with a tight fit, uniform density and assure a flat panel without voids.

According to Pat Johnson, the Project Engineer from Benchmark, ISO-C1 polyisocyanurate foam provided the required high shear modulus, superior K factor as well as the required Code specifications. In fact, ISO-C1 is the only polyiso specified by FM and classified by UL as a Class 1 foam under ASTM E-84, and is additionally specified with the Benchmark panel configuration in meeting the stringent FM 4880 requirements.



"The new 930,000-sq.-ft. USPS distribution center in Philadelphia will not only streamline and consolidate the city's postal service, it will create a new model for future facilities."

Key Players!

Owner: U.S. Postal Service, Arlington, Va.

Architect: Kling, Philadelphia

General Contractors: J.E. Dunn Construction, Kansas City, Mo.; INTECH Construction, Philadelphia

Construction Managers: Jacobs Facilities, Laurel, Md.; Gilbane Building Co., Arlington, Va.

Building Panel Designer/Provider: MeTecno-Benchmark

Insulation Supplier: Dyplast Products

Mechanization: IG Associates, Philadelphia
Geotech Services: Langan Engineering, Philadelphia

Fire Protection Services: Rolf Jensen & Assoc., Fairfax, Va.

The Client's Perspectives

Bill Powell, project contract manager at USPS, said the construction of the Philadelphia facility was in the works for almost two decades before any dirt was moved. The project, which broke ground in August 2003, was completed in late 2006. The project's mission is to streamline and consolidate postal services for the city, Powell said. In the process, it has become the first urban processing center built to use computer-aided distribution networks, and Powell said it could serve as the model for future centers in major cities.

Kling of Philadelphia designed the building, keeping in mind both the efficient circulation of mail and the thousands of workers soon to inhabit the massive building. "It became natural to think of a separating, organizing element between the administrative elements and the workroom," Kling project director Richard Farley said. For the general contractors, a joint venture of J.E. Dunn Construction of Kansas City and INTECH Construction from Philadelphia, construction has required "a little bit of everything," said Travis Noble, senior project manager from Dunn Construction.

"This is a great project in the sense that we are dealing with a lot of different types of construction in one project," Noble added. Skinned with smooth, silver metal panels and horizontal strip windows, the support building sits in front of the separating wall. The look, which Kling designer Robert Little called "soft industrial," is similar to a modern, corporate office building. Little used the panels and strip windows to exaggerate the building's horizontal proportion. "The metal panels provide a sleekness that could not be achieved in the same way with other materials," Little added. "The building would appear more massive than it actually is if brick or precast panels were used."

Like the support area, the workroom is also a steel-framed facility with metal deck and concrete floors. The exterior is a corrugated, field-assembled, metal panel with exposed fasteners that works as a cost-effective solution to keeping with the industrial aesthetic. Structural bays in the workroom area are 50 ft. by 50 ft., running the height of the workroom, which is split between two levels. Although the entire facility is the same height, the workroom area is two levels while the support areas are split into three levels.

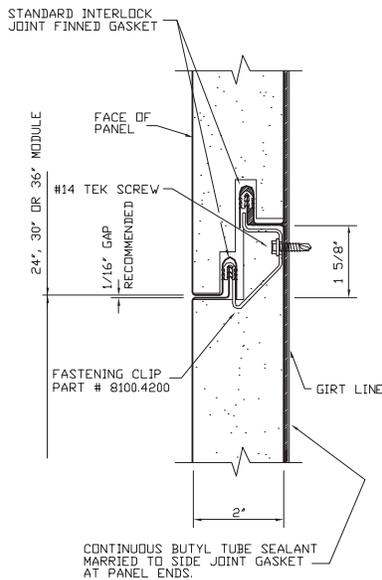




Dyplast Products' polyisocyanurate bunstock exiting the free-rise tunnel. ISO-C1 can then be cut virtually to any length and subsequently cut in sheets to 1/32" tolerance.

Why MeTecno-Benchmark Architectural Systems?

The 2000 series features a double-gasket shi lap joint in both vertical and horizontal applications to maximize thermal efficiency and create a double barrier against air and water penetration. Laminated construction allows for the maximum design flexibility for custom fabricated applications. In addition, Designwall™ 2000 allows for the use of Dyplast's ISO-C1 polyisocyanurate with its extraordinary insulating value, low water absorption, high strength, dimensional stability, and other excellent physical properties. Custom fabricated shapes are also available to meet a variety of design criteria. As with Designwall™ 500 and 1000, the 2000 Series exterior surfaces are offered in embossed steel.



"SIDE JOINT DETAIL"

Polyiso vs. Alternatives

Dyplast ISO-C1's service temperature range is -297F to +300F, making it an excellent product for architectural and structural panel applications. Although conventional wisdom has been that new generations of pentane-blown foams have poorer thermal insulating properties, Dyplast broke the paradigm by achieving an industry-best aged K-factor of 0.18 at 75F (*independent laboratory*), reaching compliance with the traditional ASTM C591 standard that many had lobbied to make less restrictive. And ISO-C1's K-factor improves significantly as temperatures drop. ISO-C1 is the only polyiso specified by Factory Mutual and classified by Underwriters Laboratories.

With the lowest K-factor of any commercially viable insulation, polyiso is the insulation-of-choice for the majority of architectural panel applications where high shear modulus, superior K factor, as well as requisite Code specifications are applicable. And twenty years after installation ISO-C1 retains essentially the same physical properties as it had after six months. Insulation alternatives for architectural panel applications are often selected only because of lack of familiarity with the improved characteristics of polyiso. For instance:

- Polyiso's insulating value is 40% better than typical structural panels made with Expanded Polystyrene (EPS); EPS also has inferior water absorption and service temperature ranges;
- Extruded Polystyrene (XPS) also has poorer insulating value with an aged K-factor of 0.259 vs. 0.18 for ISO-C1, and is manufactured in short lengths that make it unsuitable for long wall, roof, or floor applications;
- Polyurethane (PUR) insulation has been generally replaced by polyisocyanurate (PIR) insulation, which is a form of polyurethane but with better K-factor and dimensional stability. Polyurethane foam-in-place insulation is utilized in limited applications, but susceptibility to blistering, outgassing of foaming agent residues, and shrinkage must be considered.

Introduction Dyplast Products

Dyplast Products is the preeminent manufacturer of polyisocyanurate and expanded polystyrene rigid foam products, and also offers a variety of complementary products for commercial, industrial, and residential customers. With world-class production facilities in Miami, Florida, we offer our customers unsurpassed responsiveness using a wide range of product configurations. Our customer-focused staff, combined with our sound financial footing, ensure we deliver incomparable value to our customers far into the future. Dyplast Products is the preeminent manufacturer of polyisocyanurate and expanded polystyrene rigid foam products, and also offers a variety of complementary products for commercial, industrial, and residential customers. With world-class production facilities in Miami, Florida, we offer our customers unsurpassed responsiveness using a wide range of product configurations. Our customer-focused staff, combined with our sound financial footing, ensure we deliver incomparable value to our customers far into the future.

Introduction to MeTecno-Benchmark

MeTecno-Benchmark Architectural Systems is a Columbus, Ohio based manufacturer of premium flat architectural metal wall panel systems. MeTecno-Benchmark utilizes laminated panel technology with polyisocyanurate foam insulation that allows for maximum thermal efficiency plus design flexibility for custom fabricated applications.

MeTecno-Benchmark Architectural Systems is a rapidly growing company focused on serving the building industries with excellent products and customer response. MeTecno-Benchmark excels at both large and small projects, and works directly with architects, project managers and owners to achieve the maximum in building design, value, and on-time service. MeTecno-Benchmark pledges to do whatever it takes to maintain its satisfied customers.

Dyplast
products

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Because project conditions and local codes vary, the customer is responsible for determining product applicability and installation procedures. No warranties are given or implied. All implied warranties of merchantability or fitness for a particular purpose are expressly excluded.

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