

## TECHNICAL DATA SHEET

### DESCRIPTION

The Delta Tie is a two-dimensional truss of structurally non-conductive, non-corrosive fiber composite used as a wythe connector for concrete insulated sandwich panel construction. The P24 is used for 1"-4" insulation, and the P24XL is used for 1"-8" insulation.

### APPLICATION

Ties are normally installed in the seams between sheets of insulation or the insulation can be cut and the ties positioned through the insulation. For insulation with an integral vapor barrier it is important to ensure that it is also cut so as not to interfere with the concrete - tie embedment. Ties must be installed a maximum of 12" from any edge or opening. A typical spacing pattern provides one tie for every 2 to 8 square feet of panel surface area. The preferred tie orientation is parallel to the height of the panel.

### PRODUCT SPECIFICATION

- Composite Modulus - 8,370,000 psi
- Composite Tensile Strength - 167,400 psi
- Poisson's Ratio - 0.26
- Density - 100 lbs/cu ft

**Alkali Resistance** - Made from continuous wound alkali resistant glass fibers in an alkali resistant epoxy bisphenol A vinyl ester resin. The resin is rated for continuous alkali exposure at up to 180°F, and is also UV resistant. The resin's glass transition temperature is 285°F, and its melting point is 650°F.

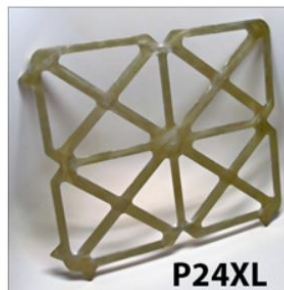
**Glass Content** - 1.45 micron, 2.4 g/m, 14GPa tensile strength, continuous roving fibers at 77% by weight. The continuous operating temperature of the 19% zirconium glass fiber is 900°F.

**Thermal Conductivity** - 0.1447 BTU/hr F ft (0.25 W/m-C) where Insulation Board is 0.014, and Concrete is 1.2414. The Delta Tie R-Value is 0.576 sq ft F hr/BTU per inch of thickness.

**CTE** - is matched to concrete at 0.000055 in/in/F.



P24



P24XL

Delta Tie

### FEATURES

- Fast and flexible installation
- Use with rigid foam insulation of your choice
- Up to 75% fewer ties versus comparable systems
- No thermal bridging between wythes
- Provides a range of composite action levels
- Passed ASTM E-119 (4 hr) and NFPA 285 fire testing
- New application software to aid with design and layout

### BENEFITS

- Increased load bearing
- Stiffer insulated panels, easier to handle
- Material, labor and transportation reduction
- Applicable to all brands of foam panel insulation

### TECHNICAL DATA

Load Capacities

\*Ultimate Strength Per Tie. Factor of Safety is variable based on the panel configuration.

Delta Tie Type	Insulation Thickness (in.)	Tension Capacity* (lbs.)	Shear Capacity* (lbs.)
P24 (5" x 7")	1" - 2"	3,407	3,602
P24 (5" x 7")	3"	2,546	1,784
P24 (5" x 7")	4"	2,136	1,356
P24XL (9" x 11")	1" - 5"	5,800	3,700
P24XL (9" x 11")	6"	3,400	3,075
P24XL (9" x 11")	7"	4,000	2,800
P24XL (9" x 11")	8"	3,200	1,650

### INSTALLATION

1. Install the required reinforcing, then place and screed the concrete for the outer wythe to its designed thickness. Flat sheet mesh and concrete design mix using a superplasticizer admixture are recommended.
2. Cut the first strip of insulation board to the required width (4"-12" max) per placement drawings and place it tightly against the side of the concrete form and on top of just cast concrete while concrete is still in its wet or plastic state.
3. Add full sheets of insulation to within 4"-12" of opposite edge; place filler piece to edge.

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4. Insert Delta Tie vertically from top to bottom of panel per placement drawings between insulation sheets. Maximum Delta Tie spacing is 24"x48". Delta Ties can work with 24" or 48" wide sheets of insulation; the width of the sheets determines the row spacing. If the tie hits the reinforcement, prior to reaching its minimum embedment depth, move the tie slightly so that the reinforcement sits in the depressed "V" section of the tie. NOTE: THE MINIMUM DELTA TIE EMBEDMENT INTO THE FRESH CONCRETE IS 1½".

Alternative Method: Cut the first strip of insulation, then insert the first row of Delta Ties spaced vertically as required. Add the remaining courses of insulation and connectors. Use the insulation manufacturers recommended tape for sealing the insulation joints.

5. When all of the sheets of insulation and connectors have been placed in the panel and once the concrete in the bottom wythe has an initial set, complete the balance of the panel by installing the required reinforcing steel, lifting inserts, embeds and concrete. Finish and cure the backside of the panel per the project's specifications. After proper concrete set, the panel may be removed from the form and the process repeated.

6. It is critical and required that Steps #1 through #5 above be completed immediately after the bottom wythe has been cast and leveled to required thickness. This is to ensure that the concrete mix is in a wet or plastic state and workable to be able to embed the Delta Tie properly. If the Delta Tie is not embedded into the concrete while the concrete is still plastic, the concrete will not properly flow through the openings in the tie, which "locks" and holds the tie into the concrete. This could result in failure of the panel.

7. When a post installation test procedure is required, the concrete strength should be at least 1500 psi at the time of the test. Using an analog or digital scale, 45-55 lbs. can be applied to the tie by hand. Any visible looseness of the tie connection would be an indication of improper installation. When combined with a check of the height of the Delta Tie exposed above the insulation, to verify that it was installed to the appropriate depth to provide at least 1.5" of embedment in both the fascia and the structural wythes, this will be sufficient to ensure that the installation was done correctly, and the remaining installation steps can proceed. Important

### Installation Notes:

1. The person that is installing the insulation and Delta Ties should lightly step several times on the insulation sheets immediately adjacent to and surrounding the tie to make certain concrete is consolidated around the tie and flows in and around the "anchoring" holes in the tie.
2. Set time of concrete varies as a function of many factors, including (but not limited to): mix design, concrete temperature, ambient temperature and mix time. The installer must ensure that the concrete has not reached initial set before ties are installed.
3. Care must be taken to ensure that Delta Ties are installed in their intended orientation in the panel
4. With the Delta Tie visible above the insulation, it is easy to verify if the Delta Tie is set at its proper depth. Utilize a tape measure to randomly check that the ties have a minimum of 1-1/2" above the insulation.

## HOW TO ORDER

Specify: (1) quantity, (2) size, (3) name

Example: 500, 9" x 11" Delta Ties

## ORDERING INFORMATION

### DELTA TIE SANDWICH PANEL CONNECTOR

Product Code	Description	Weight
124107	5" X 7" TIE	0.12 LB
143984	9" X 11" TIE	0.80 LB

## MANUFACTURER

Dayton Superior Corporation  
 1125 Byers Road  
 Miamisburg, OH 45342  
 Customer Service: 888-977-9600  
 Technical Services: 877-266-7732  
 Website: www.daytonsuperior.com

**TECHNICAL DATA SHEET****WARRANTY (ACCESSORIES)**

Limited Warranty. Dayton warrants, for a period of 60 days from the date of shipment (three years from the date of shipment in the case of formwork, excluding any consumable Products included with such formwork), that Products and any associated application drawings and engineering services provided by Dayton ("Ancillary Services") will be free from defects in material and workmanship and, in the case of custom designed formwork, that the formwork will meet the specifications set forth in the design drawings approved by Dayton and Customer. Any claim under this warranty must be made in writing within such warranty period. If any Product and/or Ancillary Service covered by a timely claim are found to be defective, Dayton will, within a reasonable time, make any necessary repairs or corrections or, at Dayton's option, replace the Product. Unless pre-authorized by Dayton in writing, Dayton will not accept any charges for correcting defects or accept the return of any Product. This warranty will not apply to any Products that have been subjected to misuse, neglect, storage damage, misapplication, accident or any other damage caused by any person other than Dayton, or that have not been maintained in accordance with Dayton's specifications. THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AS TO THE PRODUCTS AND ANCILLARY SERVICES. DAYTON MAKES NO OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. THE REMEDIES SET FORTH IN THIS SECTION ARE CUSTOMER'S EXCLUSIVE REMEDY FOR BREACH OF WARRANTY.