



Sales Engineering Technical Paper Series

Non-Metallic Cable Trays – Weathering Considerations

What is the usable life of Fiberglass Cable Trays in outdoor applications? It’s a common question posed by engineers and designers. In the past, fiberglass tray systems often needed to be over-designed to ensure that performance requirements would continue to be met as the product weathered. Cooper B-Line Fiberglass cable trays are manufactured with a superior technology that minimizes the effects of weathering.

Because the capabilities of fiberglass are not as common as other materials, a series of tests were recently completed to evaluate and predict tray performance over an extended period of outdoor service.

The basis of these tests involved exposure to ultraviolet lamps and moisture for 1000 hours. This criterion was developed by Bell Laboratories to qualify and monitor the production of fiberglass ladder side rails, and has been an accepted practice for almost thirty years. This testing method was developed to represent ten years of outdoor weathering. Coupons were taken from the side rail of a 24F cable tray and tested for mechanical properties and moisture absorption in accordance with the appropriate ASTM procedures.

After 1000 hours of testing the results are as follows:

Water absorption: ASTM D570

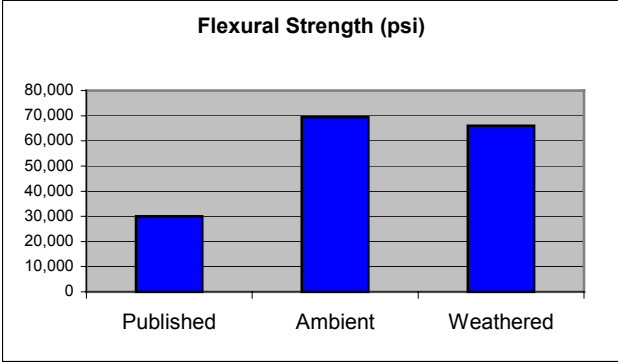
The published value for water absorption is 0.5% maximum. The weathered samples were at 0.33%. This was an average taken from 5 coupons, with the maximum being 0.36%.

Although it is recommended that all cut edges or drilled holes be sealed, these samples were not. This demonstrates that, with good field work practices, the moisture/water absorption often associated with fiberglass tray is not necessarily a concern for normal outdoor use.

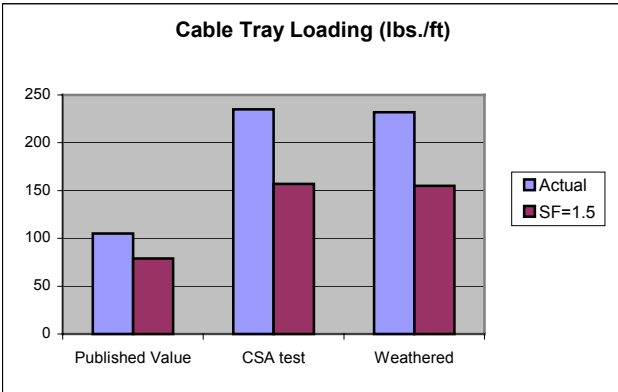
Flexural Strength: ASTM D790

A second set of coupons was placed in the weathering chamber and tested for flexural strength. The initial samples tested at 69,400psi. After exposure, these same coupons were tested at 66,000psi. This translates into a 5% drop in strength.

However, for additional safety, the currently published value for flexural strength is only 30,000psi. Consequently, even after weathering the tested values are more than twice the current published value.



The same applies to the flexural modulus. There was less than 1% loss in this case and the initial value was more than twice the published value. This value directly applies to the tray stiffness and can be used to predict the actual performance in service. Consequently the cable tray loading would be as follows:



The actual value is 232 lbs./ft. and with the 1.5 SF is 155 Lbs. /ft.

By using the full tray testing results from the CSA qualification testing, we can safely assume that a 24F tray will meet NEMA load requirements after 10 years of outdoor service.

These tests show that if the products used meet or exceed the initial performance requirements, they will also satisfy these requirements following ten years of outdoor applications. And although this test only represents 10 years of outdoor use, other applications of this same technology are already approaching the quarter century mark with no failures.

In summary, fiberglass cable tray systems need not be over-designed to maintain performance requirements over time. This allows for proper tray selection at the time of installation, saving both time and money. Look to Cooper B-Line for superior, long-lasting fiberglass cable tray systems.