



Tried & Tested

Cablofil completes testing of cable tray
with Intertek Testing Services

Forward

About the Author: Mr. Tim Place is the President and CEO of Cablofil, Inc., located in Mascoutah, IL USA. Place is directly responsible for bringing welded wire mesh cable tray to the North American market. He plays an active role in working groups for the publication of industry standards such as the Telecommunications Industry Association (TIA) and participates in continuing research for the development of new telecommunication standards. Place holds a BS and BA in physics from Greenville College and a MBA with a marketing concentration from Webster University.

Introduction

With the rapid development of Category 5e and Category 6 cable technology, leading data cable manufacturers are highlighting the importance of testing their most technological products. Much of the testing information offered to users and installers involves the cabling of the system but not the containment system.

In order to provide practical help based on factual testing, Cablofil developed a test program involving Cablofil cable tray as a containment system. As end users demand a guarantee when a new structured cabling system is installed, the program was designed to create independently verified documentation to support the installer's quality guarantee.

To give an objective interpretation of the results, Cablofil employed the services of a fully independent test facility – ETL SEMKO. This organization is a division of Intertek Testing Services Ltd., the world's largest product and commodities testing organization and a global leader in testing, inspection and certification services.

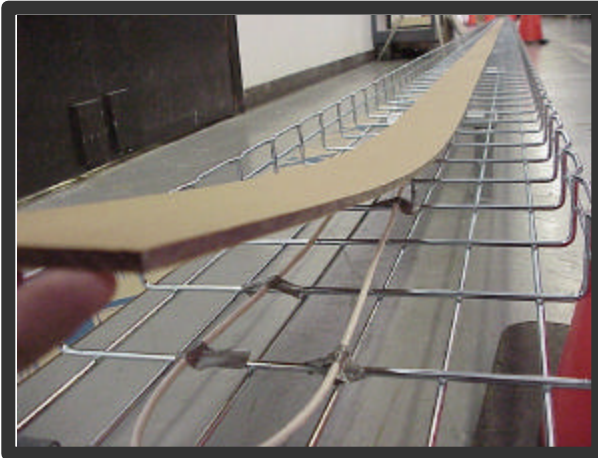
Purpose

The objective of the test program was to examine the short term and long term effects, if any, on Cablofil cable tray containing the total weight of Category 5e and Category 6 cables together with any subsequent effect this might have.

Testing Process

During the test, 300 foot lengths of Category 5e and Category 6 test cable were placed in Cablofil cable tray, subject to zero load and tested to the requirements of TIA/EIA-568A Draft II (TSB-95) and TIA/EIA-568-B-2-1 Draft respectively.

The cable was then subjected to a load; a number of Lexan strips were placed on the cables in succession. Calculations showed that five Lexan strips correspond to a total of 40 Category 5e cables resting on the test cable. This is the approximate equivalent of a depth of 8 inches of cable laid in the tray, an equivalent much greater than an average telecommunications cabling application. Cable tray fill rules are found in the NEC and TIA 569-A 4.5. A second set of measurements were taken, which allowed the difference in performance before and after the loading to be calculated.



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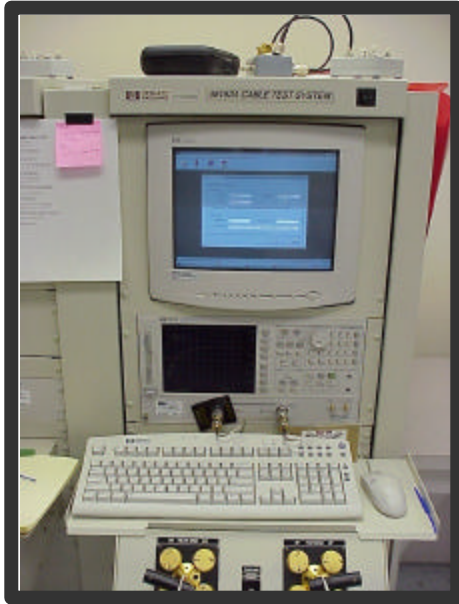
As it was not possible to determine if any changes in performance were due directly to the effect of the containment method, the test was repeated with the cable laid on a flat, even surface. By comparing these results, the effect of the containment in isolation could be seen.

A similar test examined the effect on the tray under load, simulating aging up to 15 years. Undertaken in a temperature cycling chamber, both Cablofil cable tray and the cables were subjected to a -40°F to +185°F (-40°C to +85°C) temperature cycle, 200 times, over a two-week period. A set of readings were taken before and after cycling and loading, for cables laid in Cablofil cable tray and for cables placed on a flat surface. Once again, comparisons could be made, and the effect on Cablofil cable tray was determined.

Pre-load and post-load differences were plotted on a graph along with limitations, as given in the appropriate standards. By comparing the shape of these graphs, it is possible to identify changes in the signal and therefore the effect the cables have on the performance of Cablofil cable tray.

Comparisons

Graphical comparisons were created for attenuation, NEXT, FEXT, return loss and input impedance. Return loss measures any change in the performance of the cable due to a change in its properties, causing signal reflection from impedance changes in the link. It is generally accepted that return loss is a reliable indication of how the cable may be affected within a containment system.



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The tests show that in a cable depth of 40 Category 5e or Category 6 cables, there is no identifiable difference in performance between Cablofil cable tray and a perfectly flat surface at these loads.

It does; however, appear that the effect of high temperature on Cablofil cable tray is significant. Temperature cycling tests indicated clearly that a containment system that allows air to circulate freely can provide a positive advantage, compared with an enclosed environment or flat base in which heat is unable to dissipate, leading to an unacceptable rise in temperature.

Conclusion

Cablofil's proactive approach in providing independently verified test data to confirm the performance of a cable containment system has been widely applauded by consultants, manufacturers, industry training bodies, as well as by installers themselves.

The benefits of Cablofil cable tray is well documented. Ensuring that cables are raised above floor level by a free draining, ventilated and protected system will ensure optimum performance. The maximum depth of cabling should be no greater than recommended by the specific manufacturer. The system is quick and economical to install, which is an obvious benefit to both the installer and the end user.

Having taken an industry initiative, Cablofil believes that its example should be followed by other leading manufacturers, in providing supporting test data and documentation for similar systems. What is also clear is that any additional test data that could be supplied by cable manufacturers to indicate the effect on performance of a comprehensive range of containment systems and environments, would be welcomed by designers and installers alike.

The author would like to make clear that the tests undertaken were only on Cablofil cable tray and the comments made regarding test results are only for this product. For full test results on CD, contact Cablofil at 800-658-4641.



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