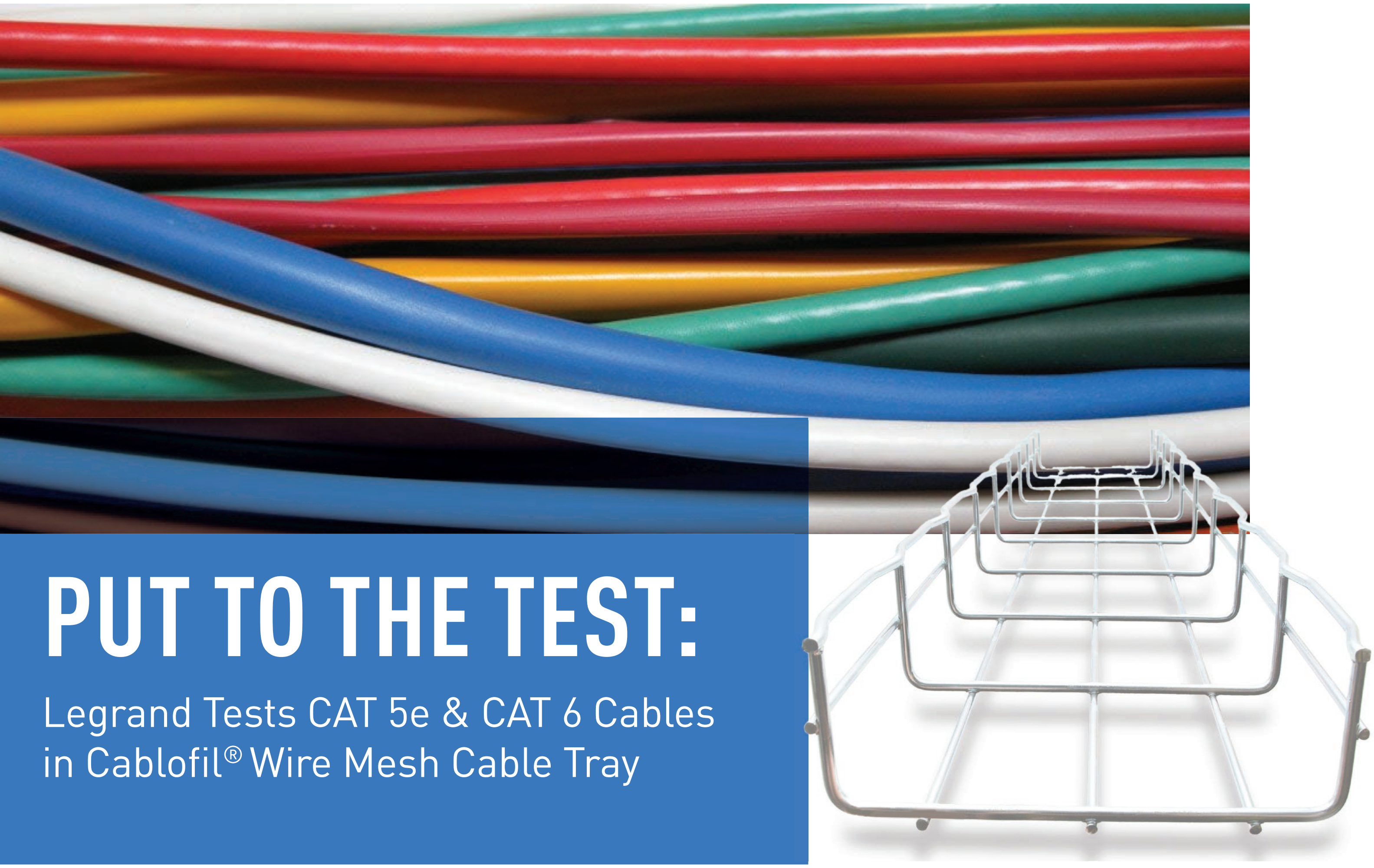


PUT TO THE TEST:

Legrand Tests CAT 5e & CAT 6 Cables in Cablofil® Wire Mesh Cable Tray

With the rapid development of Category 5e and Category 6 cable technology, leading data cable manufacturers realize how important it is to test their products. These tests are helpful when it comes to assessing cables, but often leave out the support or containment system.

Legrand developed a test program where cable tray is used as a containment system. This gives installers and end users a practical, actionable result. When end users demand guarantees after the installation of new structured cabling systems, the installer now has documentation to back up their quality guarantee.

To give an objective interpretation of the results, Legrand employed ETL SEMKO, a fully independent test facility. ETL SEMKO 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.

"When end users demand guarantees after the installation of new structured cabling systems, the installer now has documentation to back up their quality guarantee."

HOW WE TESTED

The purpose of testing was to examine potential short term and long term effects on data cable performance in Cablofil cable tray when fully loaded with data cables.

In order to do this, 300 foot lengths of Category 5e and Category 6 test cable were placed in Cablofil cable tray, subjected 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.

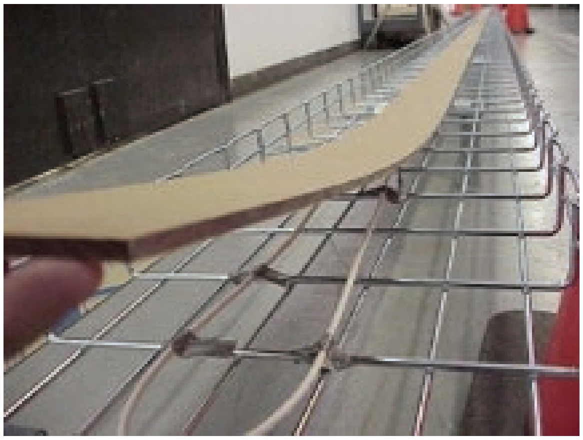
The cable was then subjected to a load. Lexan strips were placed on the cables in succession to provide a uniform crushing load. Calculations showed that five Lexan strips correspond to a total of 40 Category 5e cables resting on the test cable. This is the approximate equivalent of a depth of eight inches of cable laid in the tray, an equivalent much greater than code compliant telecommunications cabling applications. 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.

Since 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 support system could be seen.

A similar test examined the effect on the tray under load, simulating cable aging for 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. This allowed comparisons between the two to be made, and effects on Cablofil cable tray to be 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 was possible to identify changes in the signal and the effect the cable management system had on the cable performance.

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.



Five Lexan strips were used, as they correspond to a total of 40 category 5e cables resting on the test cable.

TESTING METHOD

1. 300 ft. lengths of CAT 5e and CAT 6 test cable placed in Cablofil tray
2. Subjected to zero load
3. Tested to TIA/EIA-568A Draft II (TSB-95) & TIA/EIA-568-B-2-1 Draft
4. Subjected to load using Lexan strips
5. Test repeated with cable laid on flat, even surface
6. Subjected to temperature cycle to examine effects

Comparisons were made for NEXT, FEXT, return loss and input impedance.

WHAT THE TESTING SHOWED

The tests showed that, in a cable depth of 40 Category 5e or Category 6 cables, there was no identifiable difference in performance between Cablofil cable tray and a perfectly flat surface when tested to TIA/EIA standards.

However, the effect of high temperature on Cablofil cable tray was significant. Temperature cycling tests indicated clearly that a containment system that allows air to circulate freely can provide a positive advantage compared to an enclosed environment or flat base, where heat is unable to dissipate, leading to an unacceptable rise in temperature and greater insulation deformation and breakdown.

"The tests showed that, in a cable depth of 40 Category 5e or Category 6 cables, there was no identifiable difference in performance between Cablofil cable tray and a perfectly flat surface when tested to TIA/EIA standards."

WHAT WE LEARNED

Legrand'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 are 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.

All leading manufacturers should provide supporting test data and documentation for similar systems, including containment systems. These tests are helpful and welcomed by designers and installers alike, as many are looking for information and support.

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