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## Cabling Systems for 2008 and Beyond

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The US economy is troubled, and manufacturers are facing even more of a downturn.

"The enterprise network is undergoing a major shift in emphasis that impacts cabling," said Jim Hayes, president of the Fiber Optic Association Inc., the international non-profit professional society for the fiber optic industry that develops educational programs and certifies fiber optic technicians. "Users expect mobility, demonstrated by the sales of laptops exceeding desktop computers and the popularity of mobile platforms like the Blackberry and iPhone which approach laptop capability. Wireless has had growing pains, but with the advent of 802.11n, better cell-phone data systems and the likelihood of success for WiMax, users now have adequate wireless bandwidth practically everywhere and are not crazy about being tethered to a patchcord. They are annoyed enough to have to plug in for recharging their batteries."

On the cabling scene, we are watching an unusual phenomenon. Fiber optic cabling is gaining market share with an unusual twist. It seems that for every five percent of increased fiber optic cabling installed in the horizontal building infrastructure, the copper based cabling loses 22 percent of the footage that would have been installed in a traditional structured cabling scenario. Zone cabling with fiber to the zone hub is the first giant step to fiber to the desktop (FTTD). Fiber has been a crucial part of the campus and riser solution for years. Now fiber is reaching the horizontal plane in the structure with a host of economic and functional benefits.

Currently, the plenum-approved communications cable is dominating for new building installs in the United States. Return-air plenum design is still less expensive than ducting feed and return HVAC. That brings up another area of concern: supply.



Copper continues to be a cost concern as well as a supply issue. However, the biggest supply weak point is the fluoropolymer materials used to insulate the high performance copper based twisted pair cabling for plenum approved cable.

There are only two major producers of the fluorinated ethylene propylene (FEP). DuPont produces what's commonly known as Teflon, and Daikin USA produces what's commonly known as Neoflon. If either or both of these material suppliers have a problem, the entire communications industry, especially the United States, may find itself "up the proverbial tributary with out the proper means of propulsion."

The National Electrical Code may be changed to allow other cable constructions to be approved, but that cycle with the National Fire Protection Association takes three years. The NFPA might open the plenum approved cable exemption to include the low-smoke, zero-halogen restriction of hazardous substances compliant cable that is already approved by the EU. However, that would still take three years to approve. How long could the communications industry wait? The consumer could return to the use of metallic conduit for the cable installation, but that is not likely.

A shortage of FEP has occurred several times in the history of plenum-approved (CMP rated) cable. With each shortage, prices rose dramatically, and hybrid constructions were introduced using a mix of other insulating materials to make up for some of the material shortfall. Today, that may not be possible because the higher performance cables (Cat 5e, Cat 6 and soon cat 6A) cannot function properly with the resultant delay skew caused by different insulation material properties.

The good news doesn't stop there. Increasingly, the safety focused industry watchers are asking questions about the resultant toxic gasses in the building's air system generated in a fire scenario. We are discovering that the "fire-safe" fluoropolymers materials used in plenum-approved CMP rated cables actually generate toxic gasses that can incapacitate or kill the building occupants when the cables are exposed to various levels of heat. Since the original approval of the use of CMP-rated cables in the return-air building plenum spaces, there have been no official testing of the cables for incapacitation factor or toxicity of the off gasses under heat.

Current flame testing in North America for plenum cables measures fire and smoke but disregards the toxicity and corrosivity of resulting gases, both of which are significant threats to life and property. Even without the event of a fire, the heat decomposition of FEP may emit colorless and odorless hydrogen fluoride (HF) gas, which becomes hydrofluoric acid in the eyes, nose and throat of individuals exposed to the gas. HF is the most toxic, corrosive and reactive of all the halogens.

### A safer solution from Canada

Canadian and U.S. Military departments avoid the use of CMP cable, opting for safe alternatives, such as the European standard low-smoke, zero-halogen (LSZH) cabling. All the major domestic manufacturers are making LSZH cable. It's the standard across Europe. It's accepted by stringent military specs here but isn't suitable for installation in our buildings?

Electec Ltd., a Canadian innovator of manufactured wiring systems, uses an LSZH material for EZ-Cabling zone boxes and terminal housings and offers an LSZH-cable version in addition to their standard construction.

While waiting for building codes to reflect the toxicity of Teflon, FEP and perfluorooctanoic acid (PFOA) could take years. Electec Ltd. has a solution today and continues to develop.

"I urge engineers, consultants, specifiers, building owners and contractors alike to look at the cable they are contemplating installing in their air handling spaces and seriously consider setting a higher standard, not only for themselves, but for anybody that may ever occupy the space they are realizing," said Chris Pezoulas vice president of business Development.

"When EZ-Cabling was first conceived, it was to address green building/abandoned cable issues and provide improved labor efficiencies. It wasn't until we became more educated about the materials being used as flame retardants in CMP and limited combustibility plenum communications cables that we realized we had also developed the safest alternative to plenum rated cable." Pezoulas said. "With all that we know today about the toxic nature of Teflon

FEP and PFOA, it astounds me that the policy and code makers in North America have ignored the toxicity of plenum cable flame retardants. Exposed plenum cable in air handling spaces is a chemical nightmare.”

The preterminated horizontal cabling solution features an Ultralx flexible steel armor, which, in addition to EMI and mechanical protection, offers a noncombustible fire barrier. The fire barrier prevents the cable from being a dangerous fuel and/or toxic gasses source in the event of a fire.

The environmental and safety issues will continue to play a role in the development of our future cabling solutions. For now, awareness of the problem seems to be a problem in itself.

**BISBEE** is with Communication Planning Corp., a telecomm and datacomm design-build firm. He provides a free monthly summary of industry news on [www.wireville.com](http://www.wireville.com).

