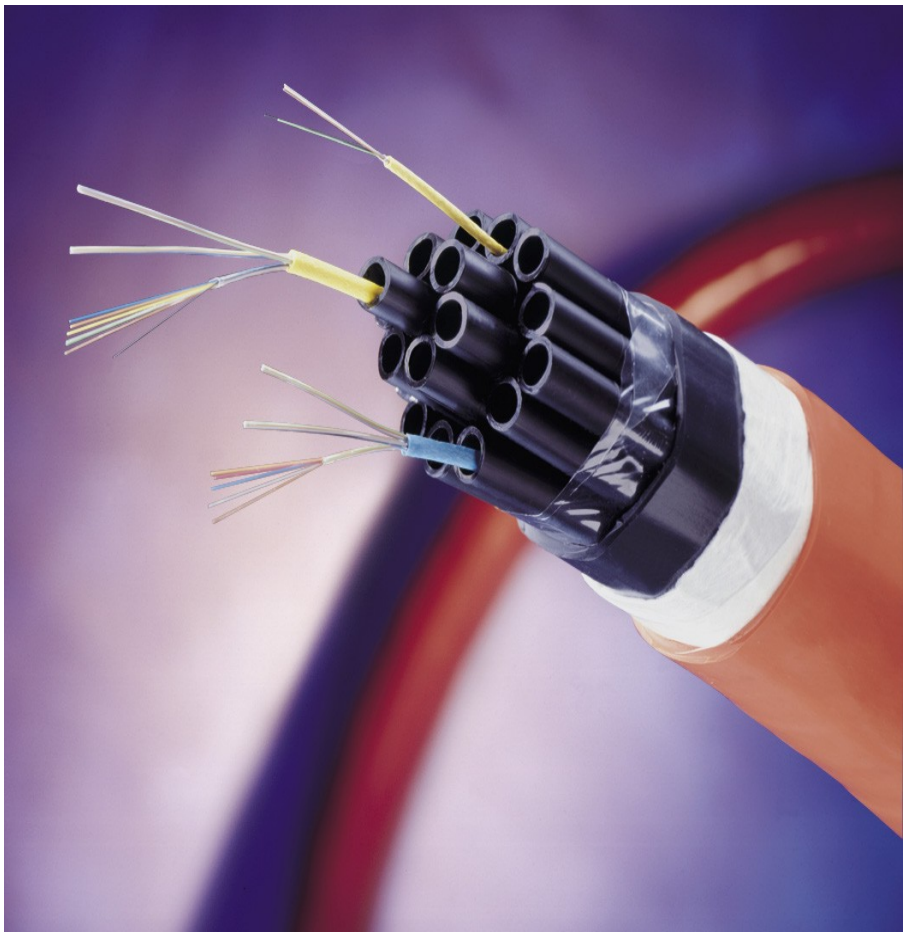
SUMITOMO ELECTRIC LIGHTWAVE

Air-blown Fiber Technology…



The GREEN Solution for Cabling Infrastructure and the Sustainable IT Network

FutureFLEX® Air-blown Fiber® is the most advanced fiber optic infrastructure for the enterprise network. With FutureFLEX, you can empower your IT network with a fiber optic infrastructure that is continuously renewable, recyclable, and sustainable with no end to its life cycle.

Upgrades, expansions, network reconfigurations, or any MACs require no construction work for an environmentally clean system that saves 70-90% in both time and labor costs.

It also provides bandwidth on demand so projects that took days, weeks or months can now be completed in only minutes or hours. Find out how FutureFLEX may impact your LEED credits and help you to achieve your vision for environmental responsibility and sustainability.

FutureFLEX™ AIR-BLOWN FIBER

Contact us today at 877-356-FLEX, email us at fflex@sumitomoelectric.com, or visit us at Hwww.futureflex.comH.

Our technical staff is ready to assist you.

Air-blown Fiber Technology: The "Green" Solution for Cabling Infrastructure and the Sustainable IT Network

Today's enterprises essentially have two choices regarding the method of fiber installation for their structured cabling and network infrastructure solutions; namely the decades old process of pulling fiber optic cable throughout the campus network conduit pathway or the adoption of an Air-Blown Fiber network infrastructure through which fiber bundles can be blown in and out of the network at will.

The conventional and still most common practice of structured cabling and backbone design is to forecast or guess what future network growth and bandwidth requirements will be. Network managers struggle with the decision of whether to install 50/125 micron multimode, 62.5/125 micron multimode, single-mode fiber, or prepare their networks with10-gig or higher bandwidth capacity. Not only must they guess which fiber type best serves their purpose, but they also must contemplate the amount of fiber to install. Due to the labor intensive process and subsequent high cost of pulling fiber optic cable, the guess has to be relatively accurate in forecasting network needs for the next 5-6 years. To manage the risk of having too little bandwidth, enterprises invest in dark fiber, installing more fiber optic cable than is required, leading to *overcrowded conduit systems, material waste, hazards of future abandoned cable, and unnecessary financial capital outlay*. Enterprises also face the risk of having installed the wrong type of fiber optic cable, since new and better fiber types are continuously being developed and introduced, subsequently necessitating labor intensive retrenching and repeating the cabling installation process. The lack of immediate scalability and the propensity toward obsolescence of traditional fiber installation, therefore, results in an "unsustainable" IT fiber optic network infrastructure.

When the enterprise network requires fiber pathway reconfigurations, expansions, and upgrades, (MACs – moves, adds, and changes) traditional cabling practices require the re-entrance into conduit systems both between and within buildings comprising the campus-wide network. Re-entrance into conduit systems and cable trays require construction/installation crews, which disrupt the building site through accessing and removing ceiling tiles and re-entering conduits already overcrowded with existing cables. Dust and debris affect the building's indoor environmental quality, especially in sanitized areas found in hospital and healthcare facilities and can adversely impact LEED (Leadership in Energy & Environmental Design) construction and waste management criteria. Moreover, repeated re-entrance into outdoor conduit systems adversely disrupts the natural areas and the habitat. Depending upon the application and cable type utilized, gels and adhesives for cable preparation are often necessary in the conventional cable installation process, which can impact LEED Indoor Environmental Quality credit 4.1.

Air-blown Fiber — The Renewable, Recyclable, and Sustainable Fiber Optic Infrastructure

Unlike the conventional fiber installation process described, Air-blown Fiber technology provides an immediately scalable, real-time, fiber installation method that facilitates a continuously renewable and, therefore, sustainable fiber optic infrastructure.

The design of the FutureFLEX Air-blown Fiber system includes a highway of tube cables that forms the fiber optic network infrastructure. The tubes, which are unused in the initial deployment, will then provide a pathway throughout the enterprise's local area network between and within buildings comprising the campus for a point-to-point, continuous, and splice-free fiber run.

After the initial installation of the Air-blown Fiber tube infrastructure, network moves, adds or changes can be accomplished simply by installing new fiber bundles into the tubes at speeds of up to 150 feet per minute, which is significantly quicker and less expensive than that employed with traditional fiber installation methods.

FutureFLEX Air-blown Fiber system materials meet RoHS standards to be free of lead, cadmium, hexavalent chromium, and mercury.

The Air-blown Fiber tube cables have small tubes within a tough outer jacket (choices range from 2-19) through which any type and amount of fiber can be blown in and blown out throughout the network on an as needed basis, providing a real-time, on-demand method of fiber installation and bandwidth control. The immediate scalability of the Air-Blown Fiber installation process eliminates the need for forecasting future network requirements, guards against network obsolescence, and eliminates the need for dark, potentially unused, wasted fiber, as is the case with conventional cabling. Since the Air-blown Fiber tubes that are not used in the initial install can be filled with fiber as needed, congested conduit, NEC requirements for the removal of abandoned cables, abandoned cabling channels that often create air flow obstructions, and wasted dark fiber material and associated monetary investment become dead issues.

From a fiber termination unit (FTU) located in an MDF (main distribution frame), data hub or telecom room, the tube cable leads to various tube distribution units (TDUs) within the campus network forming a pathway that ultimately leads to and terminates at multiple communication centers within each building. The Air-blown Fiber system is easily integrated within an existing conventional infrastructure, utilizing the same traditional termination methods.

Since fiber can be blown in and out of the tube cable quickly and easily by utilizing environmentally safe compressed air, various fiber types and fiber counts can be replaced and interchanged in a matter of minutes or hours — creating both a continuously renewable fiber installation process and a continuously renewable and sustainable fiber optic IT network infrastructure. Moreover, through the Air-blown Fiber system, fiber can actually be considered a recyclable material. Although Air-blown Fiber systems are designed differently by various manufacturers, Sumitomo Electric Lightwave's Air-blown Fiber technology allows fiber bundles to be blown out undamaged for reuse, thereby introducing the nation's first recyclable optical fiber product.

For network upgrades, reconfigurations, expansions or any network MACs, an Air-blown Fiber system eliminates the construction work and on-site disruption associated with traditional cabling methods. Since network upgrades, expansions, and reconfigurations typically require only two installers, rather than a 4-8 person installation crew, projects are executed at a fraction of the time and cost of conventional cabling. Typical fiber installation and MAC projects, utilizing the Air-Blown Fiber method, can save 70 to 90% of the time and costs associated with a conventional fiber optic system.

Rather than having to be physically at the site of the upgrade area, a technician makes the fiber upgrade, network reconfiguration, or any network MAC from either a telecom room where the fiber termination unit is located or through enclosed fiber distribution units. This Air-blown Fiber method eliminates the need to physically re-enter conduit, access and remove ceiling tiles, or disrupt the building, facility, or campus grounds in any way (an extremely valuable benefit for general asbestos control and hospital and healthcare facilities' infectious disease control measures).

Currently, no communication & information industry certification standards for structured cabling exist for LEED. However, both the Telecommunications Industry Association (TIA) and BICSI are working closely with the United States Green Building Council to establish such standards.

In the meantime, Air-blown Fiber technology does provide a non-obtrusive and an environmentally clean fiber optic infrastructure solution — positively and substantially impacting overall green initiatives and may impact LEED credits in general areas of Material & Resources, Internal Environment Air Quality, Energy & Atmosphere, and Sustainability.

Air-Blown Fiber and Sustainability:

One of the best-known definitions of sustainability or sustainable development is the definition by the World Commission on Environment and Development, which communicates that sustainability is "forms of progress that meet the needs of the present without compromising the ability of future generations to meet their needs." Another definition of sustainability in recent years refers to how long human systems can be expected to be usefully productive. Considering both definitions of sustainability, it can be said that a usefully productive system depends upon the degree of scalability and future proofing capabilities of that system.

Given the above definitions of sustainability, Air-Blown Fiber technology provides a sustainable means of fiber installation and a continuously renewable and sustainable fiber optic network infrastructure:

- By blowing in and blowing out fiber as needed in real-time, the Air-blown Fiber system is immediately scalable providing a true future-proofed fiber optic infrastructure for the IT network
- Unlike traditional fiber optic cabling methods in which predetermined fiber types and counts are laid with a limited life cycle for useful productivity before the costly and labor-intensive fiber installation process must be repeated, the Air-blown Fiber system is continually renewable and productive with no end to the fiber life cycle, since fiber types and counts can be quickly and easily replaced and interchanged on demand.
- As it relates to LEED sustainability criteria, the elimination of construction work and the need to re-enter conduit for both indoor and outdoor network MACs makes the Air-blown Fiber system conducive for conserving natural areas and the habitat, minimizing site disruption, controlling airborne dust generation, and minimizing the footprint for disruption of environmentally sensitive areas.

Air-Blown Fiber and Material & Resources (LEED MR credits)

Due to the scalability, elimination of dark fiber, almost unlimited network capacity, elimination of large construction work crews for network MACs, and essentially the inherently environmentally clean design of an Air-blown Fiber infrastructure, the impact on material and resources is significant.

- Because fiber is blown in and out on demand and as needed, an Air-blown Fiber system eliminates the need for dark, unused, wasted fiber
- FutureFLEX Air-blown Fiber bundles are reusable and recyclable
- All Air-Blown Fiber bundles are considered to be “rapidly renewable” materials
- FutureFLEX Air-blown Fiber materials are RoHS compliant
- Air-Blown Fiber eliminates the worry and hazards of abandoned cable that must be removed
- Unlike traditional fiber cabling methods, there are significantly less technicians/installers needed for both the initial Air-Blown Fiber tube cable installation and for network reconfigurations, expansions and upgrades (i.e. MACs)
- Since network MACs are completed quickly and easily in a few minutes or hours with Air-Blown Fiber versus the days or weeks to accomplish the same tasks with conventional cabling, there are fewer days/hours on the job resulting in less disruption, less material, less transportation, less contractor call-backs, and much less financial outlay (typically 70-90% project savings with continuous ROI)
- The almost unlimited network capacity of the Air-blown Fiber system eliminates congested conduit or the need to add additional conduit for network growth and expansion
- Air-Blown Fiber reels are reusable with no waste to remove; fiber bundles weigh less than conventional fiber optic cable while eliminating Kevlar and reinforcing glass rods
- With the Air-Blown Fiber infrastructure, MACs require only two technicians as opposed to the large construction/installation crews typical with conventional cabling: only 1 or 2 cars or trucks versus 4 to 6 with traditional cabling methods
- Easy classification of cable pathways eliminate the need for closet/building/pathway hunting associated with conventional fiber optic infrastructures; with Air-Blown Fiber, it’s a continuous fiber run, end-to-end, making fiber easily locatable and accessible
- Based upon the design of an Air-Blown Fiber system, it takes less time to trouble shoot a network problem, less time for network restoration, resulting in less network downtime
- FutureFLEX Air-Blown Fiber has a large network of well entrenched installation and distribution partners heavily located in major regional areas nationwide for fast support and local delivery of material and services
- Due to the clean installation method and elimination of re-entering conduit systems, removing ceiling tiles or disrupting the facility in any way for network MACs, the Air-Blown Fiber system consequently eliminates the need for special HEPA filters, NAPEs, and preparatory fiber installation processes in environmentally controlled facilities, such as hospitals, healthcare clinics, clean rooms, and laboratories.
- True future proofing, real-time, on-demand fiber installation and bandwidth control extends the life cycle of the fiber installation and infrastructure, creating a continually renewable system

Air-Blown Fiber and Internal Environment Air Quality (LEED EQ credits)

An Air-blown Fiber System's unobtrusive, non-disruptive design for fiber installation and subsequent network expansions, reconfigurations, and upgrades is inherently clean and environmentally friendly, promoting both occupant safety and environmental air quality across all enterprises spanning all vertical industries. The value of the clean Air-Blown Fiber optic infrastructure, however, is paramount for the special environmental requirements of hospitals and healthcare facilities.

- Since an Air-blown Fiber infrastructure requires no construction work for network fiber installations or MACs, it does not in any way disrupt daily operations for the enterprise or the comfort and well being of building occupants, directly complying with EQ Credits 3.1 and 3.2 for Construction IAQ Management Plan.
- By performing network fiber installations, network expansions, reconfigurations, and upgrades (MACs) behind the scenes in a centralized area, accessing and removing ceiling tiles or any construction work on walls and floors become unnecessary, thereby preserving air quality for the safety and well being of occupants. This benefit is of significant value in the hospital and healthcare sectors where infectious disease control standards must be met for patient safety.

  Unlike conventional structured cabling, Air-Blown Fiber can be easily blown in and out quickly and easily in highly sanitized or intensive care areas without construction work. Hence, the Air-Blown Fiber system immediately complies with the American Institute of Architect's (AIA) ICRA (Infectious Control Risk Assessment) standards. Air-Blown Fiber's environmentally clean process protects both patients and staff, particularly from airborne contaminants and opportunistic pathogens, such as Aspergillus, that may result in lethal infections and a direct threat to immune deficient patients. By adopting an Air-Blown Fiber infrastructure, hospitals and healthcare facilities eliminate the necessity of having to use special HEPA filters and NAPEs, move patients and staff from the work-site, engage infectious disease control officers and agencies, and train construction crews on infectious disease procedures, which comprise 40% of the time and cost of the overall network project.

- Air-blown Fiber's elimination of construction work and removal of ceiling tiles and other disruption to the interior building guards against hazards such as asbestos and airborne pathogens, promoting the health and safety of occupants through the preservation of internal environment air quality as asserted in EQ Credit 5
- Unlike conventional cabling infrastructures, the Air-Blown Fiber network infrastructure never requires adhesives or gels (EQ Credit 4.1)

Air-blown Fiber and Energy & Atmosphere (LEED EA credits)

- An Air-Blown Fiber infrastructure takes up less building space and provides virtually unlimited network capacity, thereby allowing HVAC and other energy systems to operate with unobstructed air flow
- Any system supported by Air-Blown Fiber reaps the continuously renewable and sustainable properties of the Air-Blown Fiber infrastructure. For example, new energy systems, requiring a fiber upgrade, expansion, or new pathway reconfiguration, can be installed in minutes or hours without disrupting the facility versus the days or weeks it would take to complete the costly and labor intensive project utilizing traditional cabling. The real-time control of the energy system

and fast restoration turnaround times, provided by Air-Blown Fiber, ensures the system will always operate at peak performance.

Closing:

The continuously renewable and sustainable attributes — as well as the labor savings, continuous ROI, and significant reduction in the overall cost of ownership —provided by an Air-Blown Fiber network infrastructure has catapulted its adoption among progressive organizations including the Pentagon, Mayo Clinic, NASA's Constellation Space Program, University of Phoenix (Cardinals' Stadium –Host of the 2008 Super Bowl), ESPN, CNN, McCarran International Airport, Johns Hopkins University and many others. Given the inherent environmentally clean design of an Air-Blown Fiber infrastructure and the myriad of contributions it makes to the Green initiative, enterprises have even more justifiable reasons to consider the benefits of Air-Blown Fiber in the development of a truly sustainable IT network.

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