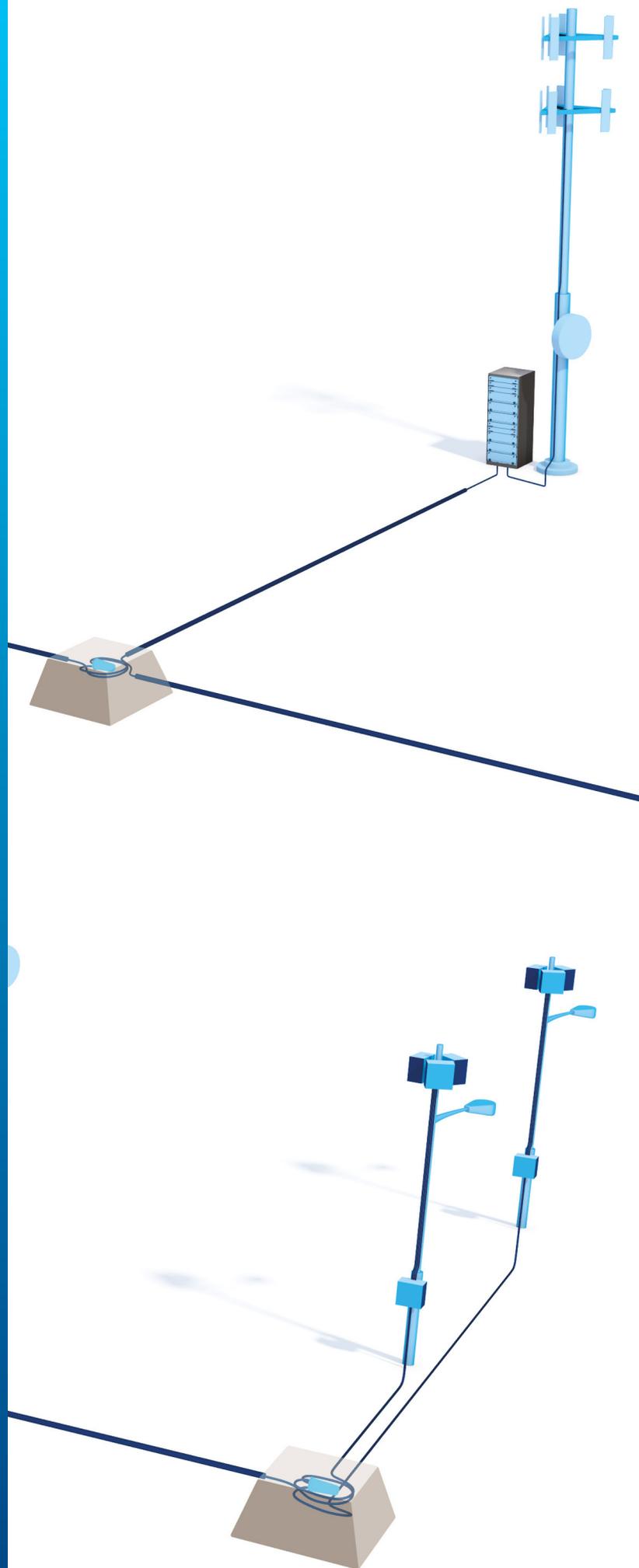


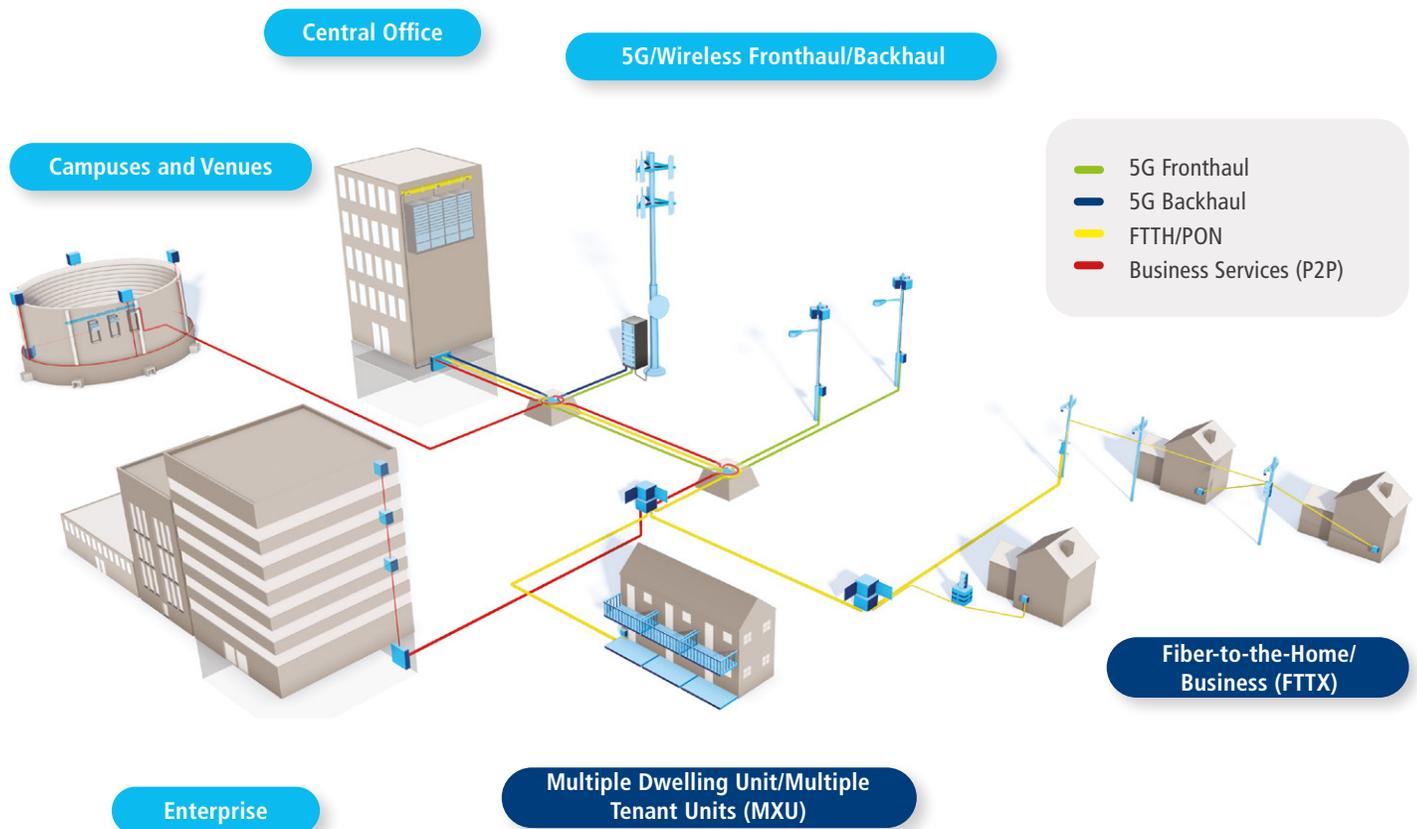


5G Fronthaul and Backhaul

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The AFL Converged Access Network



Click on the blue buttons above to see how AFL's fiber and equipment solutions can help you build an expandable, flexible and accessible network in a range of application areas.

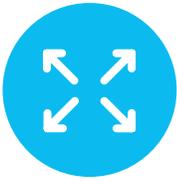
To read more about our MXU and FTTX Solutions visit: learn.aflglobal.com/brochure

The access network of today and tomorrow is not an FTTH network. It is not a 5G Backhaul and Fronthaul network. And it is not a set of point-to-point connections for business services. It is all these things at once and more. It is a platform—a highway of the future connecting service providers to their customers. It is a highway that must carry all the traffic of today, and all the traffic that will be there tomorrow.

However, we don't know what the traffic of tomorrow will look like. How much will home data traffic grow compared to others? What will future versions of PON (Passive Optical Networks) require for

wavelengths and split ratios? How dense will 5G, or someday 6G, small cells be? What will be their bandwidth requirements? How will enterprise connectivity demands change over 20 years? These questions are impossible to answer definitively. But we can still build the access network today which will be able to handle the answers—the AFL Converged Access Network.

AFL's Converged Access Network meets the demands of the present and the future through three key characteristics: Expandability, Flexibility and Accessibility.



Expandability

Expandability refers to the ability of a network to handle increased traffic in the future. The simplest way to do this is to deploy more fiber, but there is an expense to this. AFL solves this problem in several ways. One of the most dramatic ways is by providing the most compact ribbon cables available-AFL's Wrapping Tube Cable (WTC) with SpiderWeb Ribbon® (SWR) technology. This cable allows more fiber to be deployed in the same pathways so that network operators can deploy far more fiber with only an incremental increase in cost. These higher density fiber cables allow operators to use a portion of the fibers to support current needs while allowing for further growth with the remaining dark fibers. AFL also accomplishes expandability through modular solutions such as IDEAA® distribution cabinets and ASCEND® fiber panels.



Flexibility

Flexibility refers to the ability of a network to adapt to changes. The specific nature of network demands is hard to predict. What if a disruptive wireless service provider installs 5G nodes at certain locations, and needs fronthaul and backhaul services? Merely having fibers near the locations is not enough. Fortunately, AFL splice closures, terminals, hubs and other components provide modular and highly flexible solutions which allow the network to adapt. Need to make a new fiber connection somewhere? 12 fibers? 24? Change the wavelengths used in the network? With AFL solutions, the network can be redesigned to accommodate these scenarios.

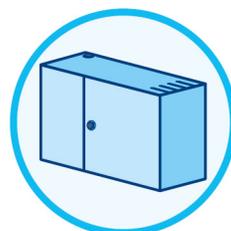


Accessibility

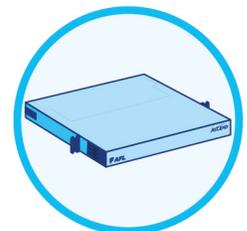
Accessibility refers to the ability of technicians to go into the field and make network changes. It is one thing to make design changes on a computer image; however, making those changes in the field can be a challenge. Here, too, AFL provides solutions including highly modular, craft-friendly connections, industry-leading fusion splicers and test equipment which also make documentation simple, and even the design of SWR makes craft interaction easier.



WTC/SWR Technology



IDEAA®
Distribution Cabinets



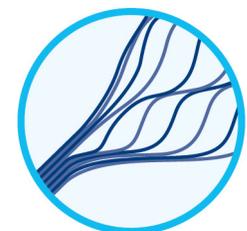
ASCEND®
Fiber Panels



Fusion Splicers

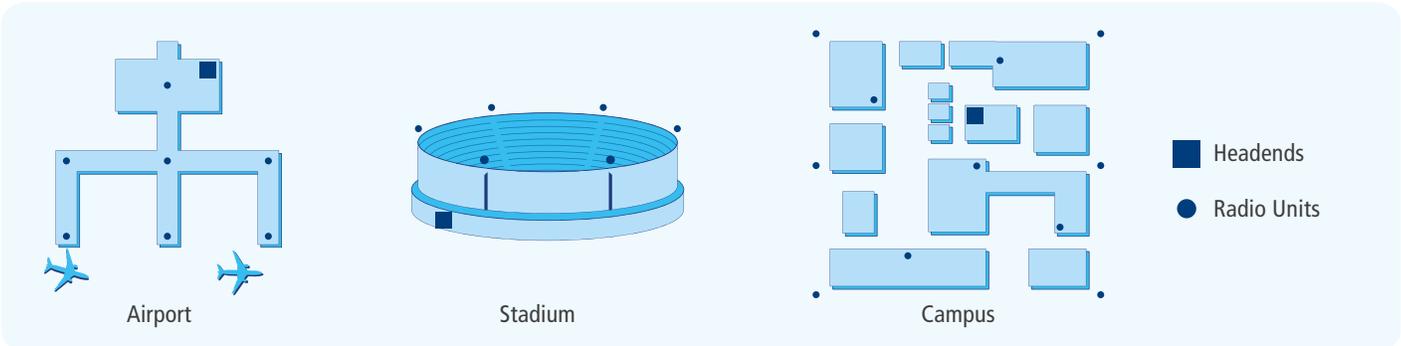
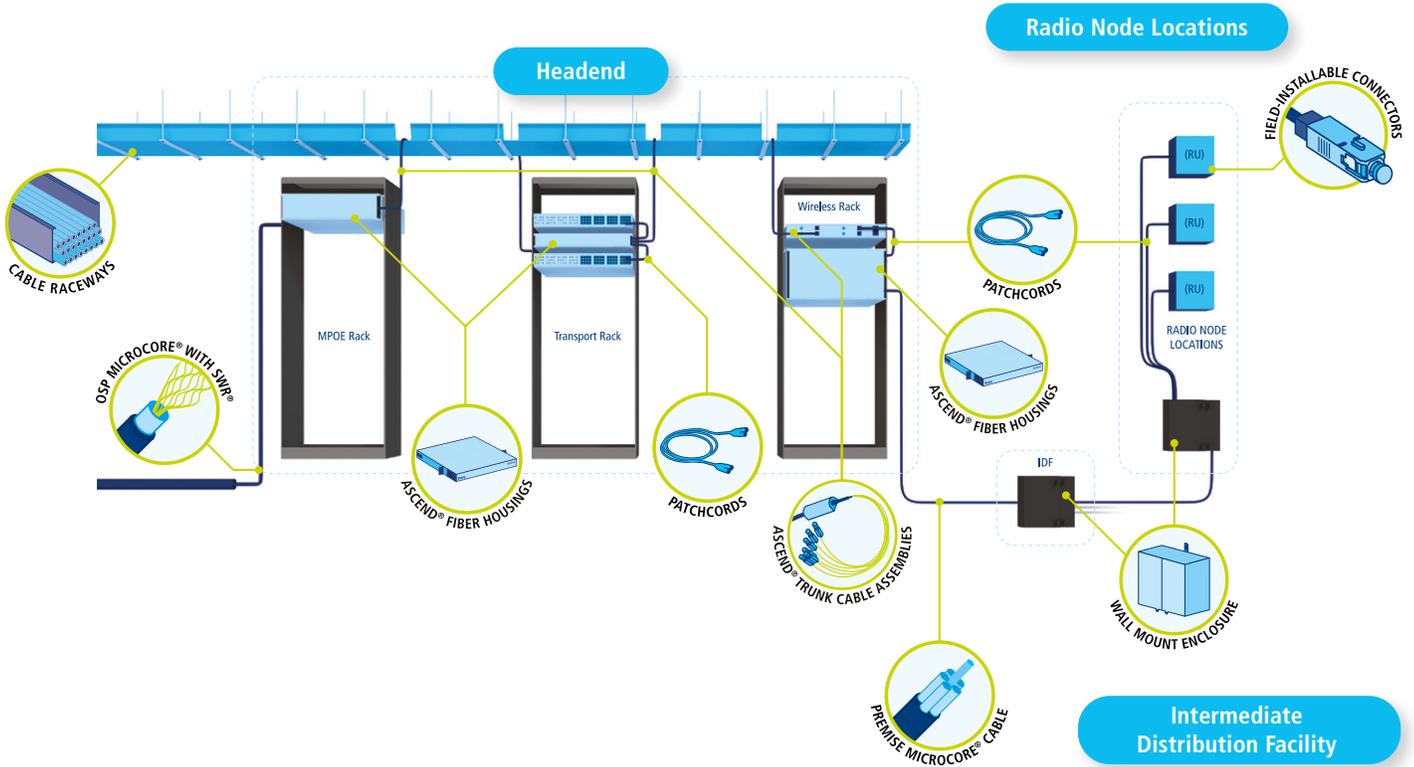


Test Equipment



SpiderWeb Ribbon® (SWR)

Campus/Venue Networks

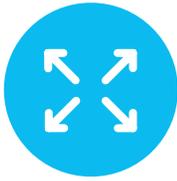


Passive DAS system depicted

 Click on the blue buttons in the image above to see more about the products that make up the AFL Campus/Venue network solution.

24/7 connectivity is one of the key characteristics of modern society. In locations where people gather in large numbers, the expectation is to have seamless connectivity and bandwidth. Meaning, higher-density wireless access points are needed plus a higher-density fiber infrastructure to support them. AFL has the right solutions for this type of network.

AFL offers several key benefits for the campus and venue network:



Expandability

AFL’s Premise MicroCore® and Wrapping Tube Cable (WTC) with SpiderWeb Ribbon® (SWR) provide an ultra-high density of fiber within a given pathway. With space often at a premium in campus/venue environments, network designers and installers benefit from these cable options when designing a robust network that consists of enough fiber for current and future generations. Modular components like AFL’s ASCEND® panel also allow for upgrades to higher fiber counts, different wavelengths and more. This maximizes the amount that a network can grow before it needs to be replaced and the chance that critical hard-to-install components (e.g. cable runs) can remain in place through upgrades.



Flexibility

AFL offers several points of flexibility for network designers, installers and operators. Modular products like the ASCEND fiber panel and WME enclosures allow many options to reconfigure networks by changing splice trays, connectorized modules and more. AFL’s FASTConnect® and FUSEConnect® field-installable connectors also provide flexible termination options.



Accessibility

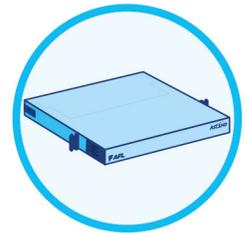
From SpiderWeb Ribbon’s remarkable design to make 200 µm fiber backward compatible with 250 µm for ribbon splicing, to our industry-leading core alignment Fujikura 90-series splicers, to the craft-friendly and modular design of ASCEND panels and WME enclosures, AFL makes it straightforward and simple for technicians to install and maintain fiber networks.



Premise MicroCore®



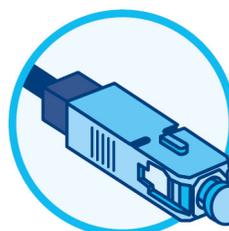
WTC/SWR Technology



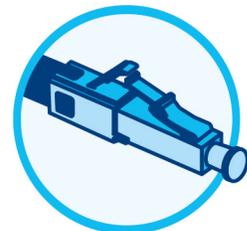
ASCEND® Panels



ASCEND



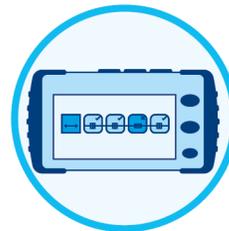
FASTConnect®



FUSEConnect®



Fusion Splicers



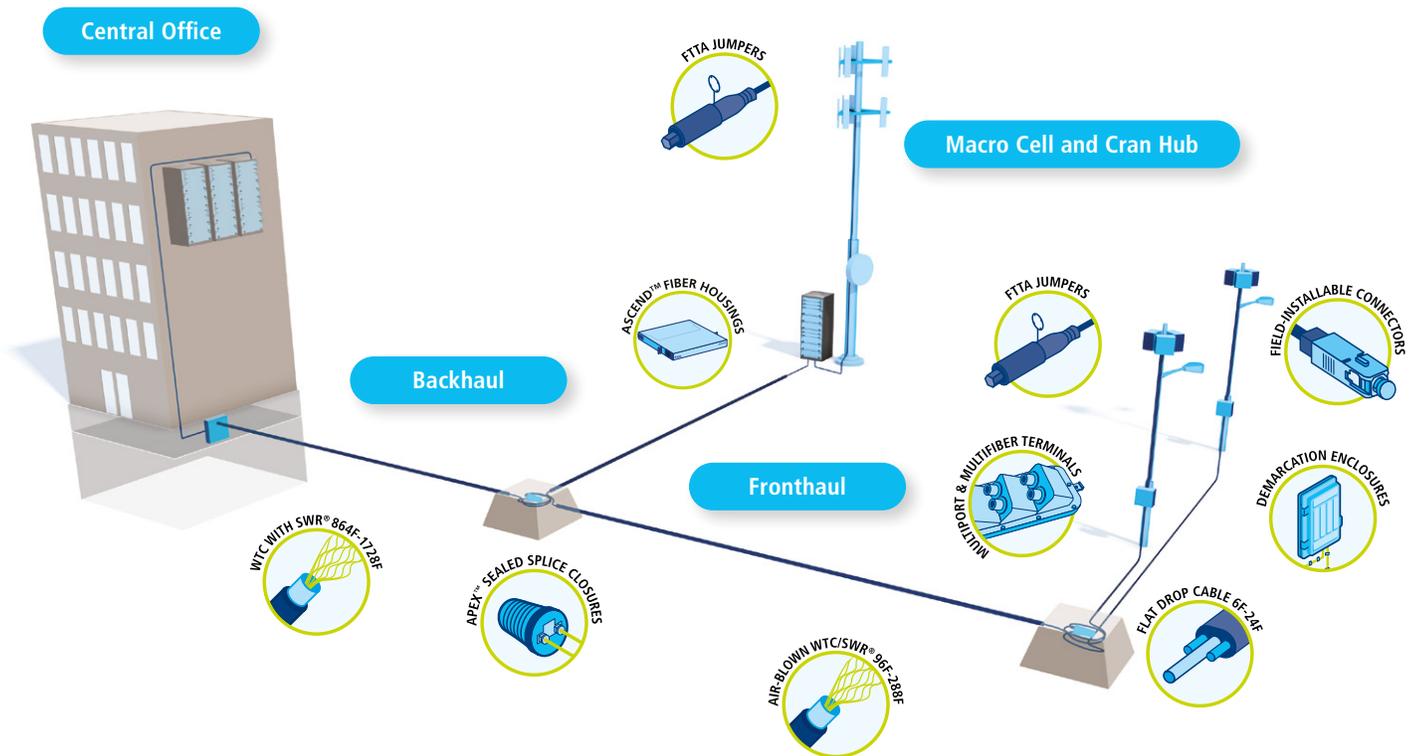
Test Equipment



SpiderWeb Ribbon® (SWR)

5G/Wireless Access Network

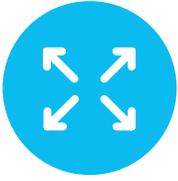
(Fronthaul, Backhaul, CRAN Hubs, Macro and Small Cells)



Click on the blue buttons above to see how AFL's cable, connectivity, splicing, and test and inspection equipment work together to enable an expandable, flexible and accessible access network for wireless services.

AFL offers industry-leading solutions for LTE and 5G fronthaul and backhaul. As wireless data traffic continues to grow exponentially, the demands placed on the access network also continue to grow in two important ways. First, through the addition of more small cell sites covering smaller areas, and secondly through the increase in data traffic to and from each cell site. A further development is in the implementation of CRAN (Centralized or Cloud Radio Access Network) which centralizes base station functions for several small cell sites.

Key challenges faced by operators include: planning the connections to many small cell sites, making (and getting permits for) pathways and handholes to connect all of these sites, and planning future flexibility in case more small cells need to be added later—or another wireless operator comes along, representing a potential customer and revenue stream for the access network. Here again, the key characteristics of AFL's Converged Access Network provide critical advantages.



Expandability

AFL's Wrapping Tube Cable (WTC) with SpiderWeb Ribbon® (SWR®) provides the highest amount of ribbon fibers in the smallest space possible. This allows more fiber to be deployed in the same duct space and coiled in smaller handholes, easing installation and permitting, and allowing for future growth. AFL also offers highly modular connectivity solutions which can be expanded and modified to accommodate new customers.



Flexibility

AFL's solutions allow the Access Network to be redesigned to accommodate new customers and usage cases. The design of SWR allows for simple separation of one to 12 fibers at a time. The use of highly modular components in our ASCEND® panels and other products allows for changes to the number of fibers connected, the use and type of Wavelength Division Multiplexing (WDM) employed, and more.

This allows the access network operator to build a network today with the confidence that they can adjust it as future demand patterns change.



Accessibility

It is one thing to design a network that is expandable and flexible; but to make use of those characteristics, someone needs to go out in the field and make a change. AFL creates craft-friendly solutions so that the change process simple.

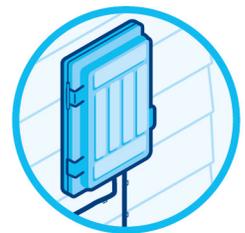
- SWR® technology makes it easy to identify and separate any number of fibers from an existing cable to make a new connection.
- Wrapping Tube Cable is flexible enough to store easily in a handhole or aerial slack loop.
- Closures are easy to enter, change, exit and re-seal.
- Fujikura core alignment fusion splicers, like the 90S and 90R, make splicing easy to perform and document. AFL leads the industry in solutions for splicing dissimilar fibers like 200 µm to 250 µm and bend insensitive to standard fiber.
- Test and inspection equipment is easy to learn and use, making documentation a cinch.



SpiderWeb Ribbon® (SWR)



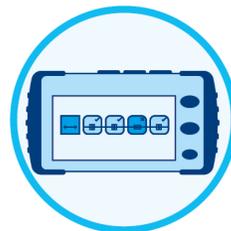
Wrapping Tube Cable (WTC)



Closures



Fusion Splicers



Test and Inspection Equipment

About Us

Our exceptional products, innovative solutions and engineering expertise make connections possible

AFL provides industry-leading solutions, products and services to the energy, service provider, enterprise, hyperscale and industrial markets.

We manufacture, engineer and install fiber optic products and associated equipment.

This includes:

- Fiber optic cable
- Transmission and substation accessories
- Fiber optic connectivity
- Fusion splicers
- Test and inspection equipment

AFL's service portfolio includes market-leading positions with the foremost communications companies supporting central office, outside plant, wireless and enterprise applications.

Whether you need to build or upgrade a network or apply the latest fiber optic technology, AFL connects you with the solutions that fit your every need.

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