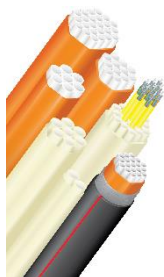


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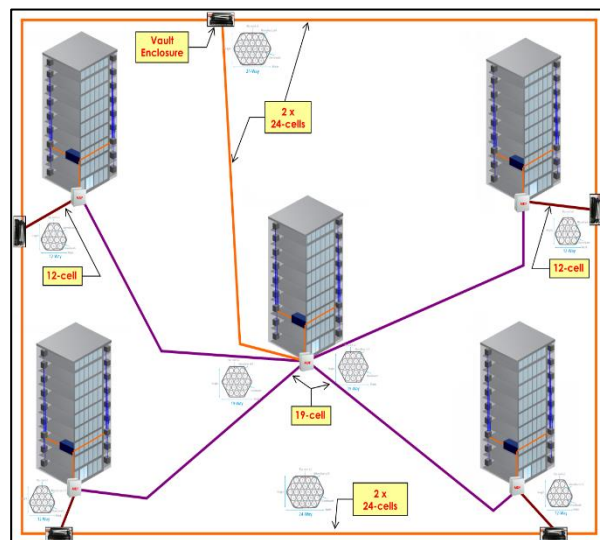
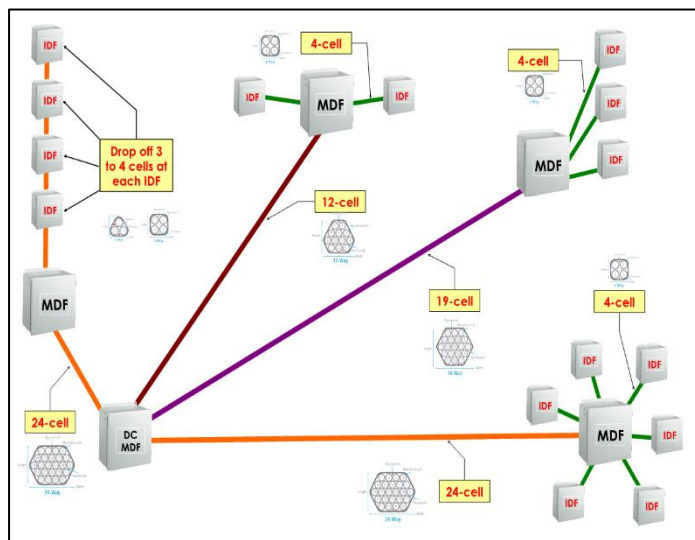
Key Aspects of Jetted Optical Fiber Cables – Industrial Sites

While there are many specific advantages of using Jetted Optical Fiber Cables as opposed to pulling traditional Optical Fibers, there are some key features which stand out when applied to harsh environments and industrial locations. The most outstanding feature, is regarding the ability to rapidly change the fiber strand count or type (OS2, OM1-OM5) on the fly ... without having to physically unearth the pathway. Let's examine how this works ...



Jetted fiber was MADE to be blown IN and OUT in a matter of minutes, from its rugged pathway. The pathway is a collection of tubes, cells or MicroDucts that are jacketed with a very durable material ... most often recently, using HDPE (**H**igh **D**ensity **P**oly**E**thylene). This outer jacket or sheath is so durable that it can be direct buried, directionally bored, trenched, etc ... without using an outer armor (*the exception is when an area suffers from large mouthed rodents that insist upon such a diet*).

Taking this rugged pathway between buildings in an industrial campus and continuing into those buildings in RISER and/or PLENUM areas, suggests that the best design techniques employ a home-run strategy. More clearly, let's assume a basic design that include a central data location that needs to connect to multiple buildings, floors and edge devices. By using a home-run design, one now has specific MicroDuct(s) that feed from the central location to each endpoint. Further, these MicroDucts can easily be “uncoupled” and rerouted at any time, to change the path's direction.

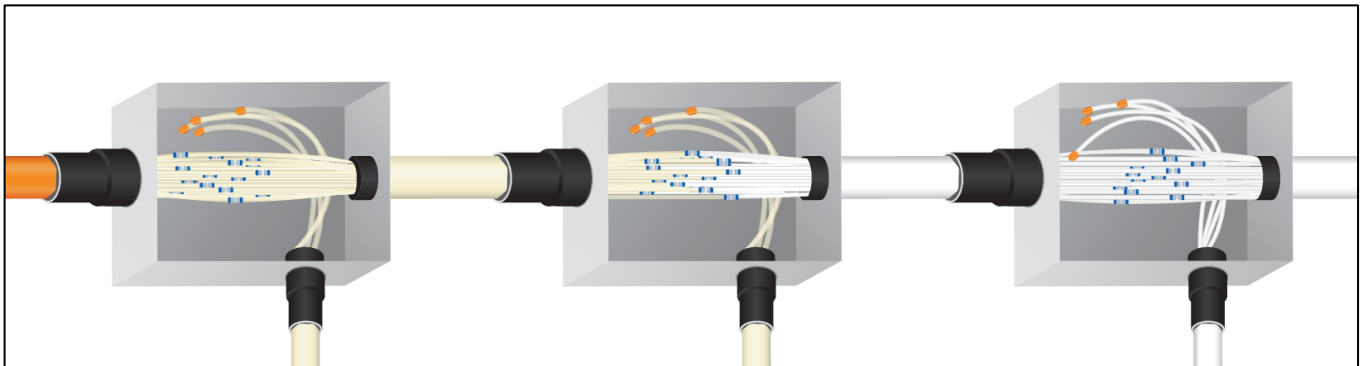


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When we take a step back to look at what this gives us, we immediately see the following distinct advantages ...

- All pathways are typically unseen ... buried (with or without an exterior 4" conduit)
- The pathways do not need to be excavated whenever a major change is needed
- To re-route a pathway, the MicroDucts are simply uncoupled and recoupled ... after jetting internal fiber cables out (if present).
- Fiber can be added, changed or removed from any MicroDuct run at any time ... in a matter of minutes.
- Removed fiber can be repurposed & reused in future runs

What one may not realize, until doing a bit more investigation, are the other advantages that are brought forth when using a true enterprise type jetted fiber cable that is INDOOR/OUTDOOR rated. Such a fiber cable typically has water-blocking within, plus is flame rated to pass RISER or PLENUM requirements. This suggests that the fiber cable is **NEVER SPLICED** between environments ... typically a requirement when deploying conventional fiber between outdoor, indoor and air-handling spaces. The reason this works, has to do with the change in pathway material in those different areas.



Look carefully at that image. The pathway is changed from one material to the next, by coupling the inner MicroDucts together. The first junction reflects coupling of outdoor HDPE to RISER-rated pathway. The second junction reflects coupling the RISER-rated pathway to PLENUM-rated pathway. The Indoor / Outdoor fiber can now be routed straight through the entire connected pathway from start to endpoint ... no splices of fiber strands.



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So, what other features or advantages does jetted fiber bring to the party? Let's take a closer look at the list ...

- **Static vs Dynamic:** Traditional pulled fiber is generally pulled into place and then left alone. When it's usefulness is done, most times it is abandoned. Jetted fiber is never abandoned. It can be quickly and easily jetted back out, leaving the pathway ready for a new fiber cable.
- **Non-disruptive Access:** Any time fiber needs to be changed, pulled fiber can often disrupt the normal functionality of an industrial or manufacturing plant, due to having to completely re-access the original pathway. Not true with jetted fiber. One needs only to access the junction enclosures within the telecom closet, etc. The "in-between" pathway stays intact and in place.
- **Lower Labor Costs:** With conventional pulled fiber, fiber is typically dropped off in multiples of 12 strands ... regardless of what is needed. Jetted fiber is specific to each individual MicroDuct. One can choose any fiber type (OS2, OM1-OM5) and counts from 2 to 96 strands PER MicroDuct. No splices and fewer individual fiber terminations mean reduced labor costs. Not to mention reduced testing and enclosure costs.
- **Distance of runs:** Because conventional fiber is pulled, one is limited to the manufacturer's tensile strength rating of the overall cable ... typically 300 to 600 lbs. Jetted fiber is NEVER pulled ... it is safely jetted on a stream of air or nitrogen. The pathway is rated considerably higher. For example, a 19-cell pathway has a 2,500 lb tensile strength rating. A 24-cell pathway is rated around 3,100 lbs !!! This suggests that one can have fewer pull-points and/or vaults, because they can be spaced apart with more distance.
- **Duct bank size:** Duct banks are typically over-sized because of the eventual congestion of filled innerducts ... housing abandoned cables. Since jetted fiber is never abandoned, duct banks can be comfortably downsized.
- **Fiber Count Density:** It is interesting that if one populates a 4" conduit with 5 x 12-cell pathways (60 pathways total) and jetted a 96-strand fiber through each of the MicroDucts or cells, the aggregated total would be 60x96 or 5,760 strands of optical fiber. But more importantly, that is what COULD be jetted within that single 4" conduit. The total potential is real, but normally not necessary in the beginning.

In summary, jetted optical fiber has so many more positive aspects than does conventional fiber. When you consider the non-disruptive access that it gives to a network, it's a win-win for all.

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