

Inventory in A FTTX PROJECT



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Introduction

Inventory is an essential part of any project. When considering a fiber-to-the-home (FTTH) project, vendor selection must include consideration for the impacts certain products will have on the project's inventory. Additionally, the vendors involved with a project must be innovative with their product sets to allow for the project to be efficient on inventory while maintaining supply chain certainty. Inventory plays a critical role in allowing a project to maintain a certain construction rhythm and allows the construction to stay on schedule.

However, too much inventory could place a project in financial strain if left unchecked. A FTTH project will require balancing the financial constraints of inventory while also having materials available to service the construction needs. The following sections will first look at inventory and its impacts on a company's financials. Then, it will discuss innovative products that allow a firm to solve the financial constraints of inventory while servicing the project.

Financial Impacts

Inventory impacts a company's financials in several ways. The best way to think about this is through the lens of the accounting equation as seen in Equation (1).

Assets = Liabilities + Equity

Equation 1 - Accounting Equation

At the surface level, inventory is a current asset, albeit a less liquid asset than cash, which reduces your cash reserves. This cash, which could be gaining a market return, is now tied up in a depreciating asset. Additionally, there is a risk that the inventory becomes obsolete through technology advances and must be written off altogether

which can inadvertently impact your Profit and Loss (P&L) statement. If inventory must be written off due to obsolescence, this would be recorded as an expense which would directly impact your net income. As seen in Figure 1, the inventory would affect the expense on your P&L which would in return affect your net income impacting the shareholder's equity.

Another consideration when there is an increase in your inventory position is the costs associated with storing and managing that inventory. This can include warehousing, insurance, lease agreements and obsolescence as mentioned.

This results in the balance sheet being impacted by reduced cash which requires higher working capital. The P&L is impacted by higher operating expenses and the risk of writing off inventory which would reduce net income. Distribution partners can be a tool to leverage that will assist with inventory. Otherwise, partnering with your vendor on innovative products to reduce inventory impacts is a clear next step.

Cable Hardware Consolidation

One aspect of a FTTH project is the hardware used to support the cable. In an ADSS application, hardware is often in inventory at high volumes to service construction. One way to reduce the inventory impacts is to have the vendor create a design package for various

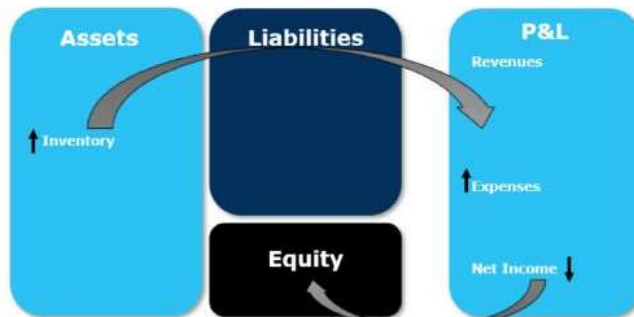


Figure 1 - Inventory impacts from Balance Sheet to P&L

fiber counts. This means that if you had a 72 fiber, 96 fiber and 144 fiber cable in your project, each fiber count would have the same diameter so you can reduce different types of hardware required for the project. As seen in Figure 2, this includes dead-ends, tangent trunnions, downlead clamps and vibration dampers.

Additionally, there may be a case where you have existing inventory of hardware and need the cable vendor to match the diameter of that hardware. The vendor will need the ability to custom design the ADSS to match that hardware to avoid write-offs which will alleviate the net income impact this could have.

Another way that this manifests itself is in the transmission/distribution side of a fiber network with Optical Ground wire (OPGW). Transmission lines that were built 20+ years ago may already have an OPGW cable installed but at a low fiber count and may now require a higher fiber count due to grid modernization needs. With the technological advancements in fiber, OPGW can now be designed with much higher fiber density which results in grid modernization without changing diameters of hardware. This is made possible through 200 μ m fiber technology. As seen in Figure 3, 200 μ m fiber has the same core of 125 μ m as regular 250 μ m fiber but with a reduced coating.

The result of this 200 μ m fiber technology is that it allows

Innovation in products such as LMHD and WTC cable allow for a reduction in traditional diameters and reel sizes; and AFL's Switchblade offers both space and freight savings.

for up to a 50% increase in fiber density in an OPGW cable. This allows your project to increase fiber count without sacrificing the current inventory of OPGW hardware at the original diameter as seen in Figure 4.

Cable hardware can easily be a strain when it comes to inventory but partnering with the right vendor can help you fully leverage design or fiber technology to reduce any impacts on inventory.

Cable Technology

Cable is a huge inventory item of any FTTH project. Its therefore natural that cable can also be an area of concern as you manage inventory. There are new cable technologies in the market that have made noticeable advancements in reducing diameter. Diameter reduction has several impacts on a project but specifically to inventory it can affect your space required for storage.

Microcable technology in the form of AFL's LMHD MicroCore® 600-lb-rated micro-loose tube cable brings

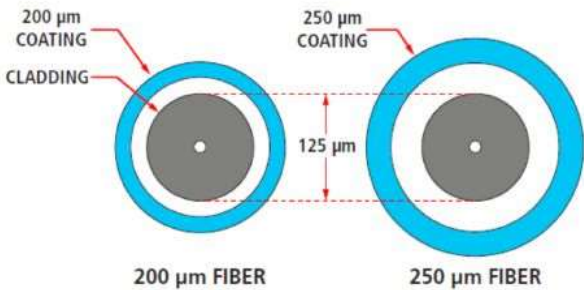


Figure 3 - 200 μ m fiber technology

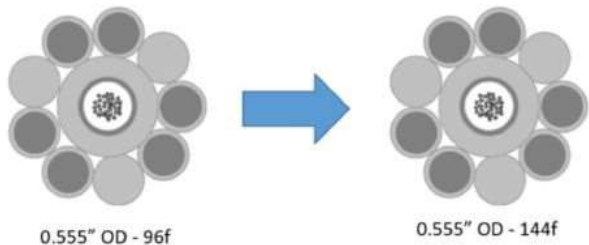


Figure 4 - Fiber count increase in OPGW while maintaining diameter

Fiber Count	Part Number	Diameter (in)	Dead-end	Tangent Trunnion	Downlead Clamp	Spiral Vibration Damper
72	AE0729O620EA1	0.492	ADESE482/510C	ATGN475/525	AGC562562D	AVD462/563
96	AE0969O620EA1					
144	AE1449O620EA1					

Figure 2 - Hardware design packages



Figure 5 - Traditional versus LMHD cable

to the table the same advantages of traditional loose cable but with a 35% reduction in diameter across fiber counts¹ (Figure 5). This can aid in inventory cost reduction as the smaller diameter cable can either fit on smaller reels saving space or drive up reel capacity requiring less reels in total for the project. Comparing 30,000 ft of a traditional 144f loose tube cable with an LMHD 144 fiber yields a reel reduction from an 84"x42" reel to a 58"x32" (Figure 6). From an inventory perspective, this can mean up to a 47% decrease in inventory space required for reel storage.

Wrapping tube cable (WTC) with SpiderWeb Ribbon® (SWR®) is also another example of diameter reduction through fiber technology. With the innovation of SWR,

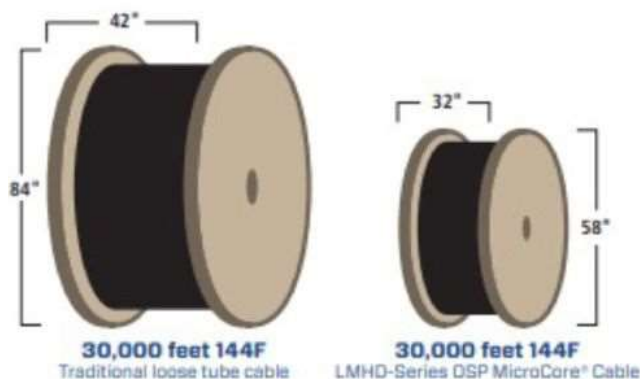


Figure 6 - Reel size comparison between traditional and LMHD cable

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WTC can drive down the average diameter across fiber counts by 18% compared to traditional OSP technology². This is made possible by the intermittent bonds between fibers which allows for flexibility and bunching of fiber bundles as seen in Figure 7.

Both LMHD and WTC utilize innovative cable technology that allow for diameter reduction which helps save on inventory costs from a space standpoint.

Switchblade® Fiber Containment Vault Handholes

Similar to cable, handholes are another product within a FTTH project that can take up considerable real estate. AFL's Switchblade® Fiber Containment Vault handhole

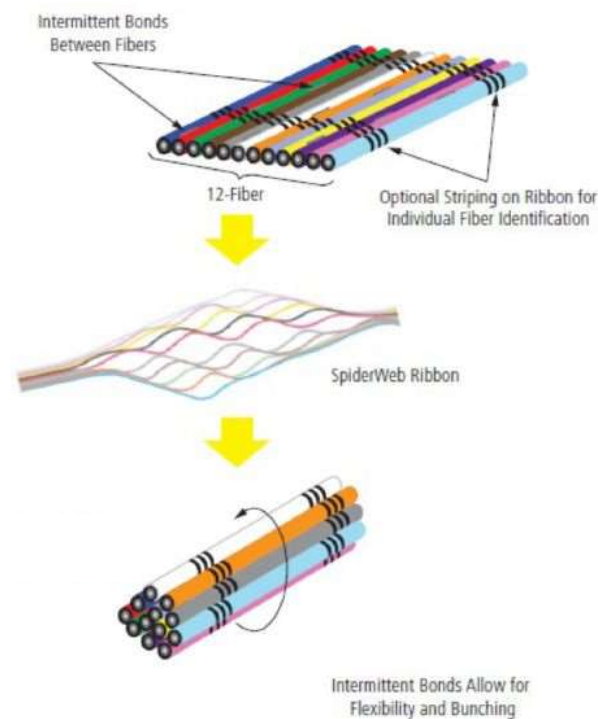


Figure 7 - Spiderweb Ribbon technology

1. Martin, S. (2018). Next generation of fiber optic loose tube cable. AFL Global.

<https://learn.aflglobal.com/white-papers/next-generation-of-fiber-optic-loose-tube-cable>

2. Dobbins, P. E., & Villiger, B. (2015). New ultra-density fiber cable technology for fttx and access markets using new Spiderweb Ribbon®. AFL Global. <https://learn.aflglobal.com/white-papers/new-ultra-density-fiber-cable-technology-for-fftx-and-access-markets-using-new-spiderweb-ribbon>



Figure 8 - Switchblade folding handhole

strives to address this problem. As seen in Figure 8, it has a folding design that allows it to collapse into a stackable, condensed product. With a weight reduction down to 66 lbs., the freight impacts are apparent and the advantages to inventory are huge. So, not only can you ship 200 units on a truckload instead of 120 (Figure 9), but this space savings on the freight side also trickles down to your inventory space as well with the folding design allowing for reduced laydown yard space requirements (figure 10).



Figure 9 - Switchblade freight savings

Distribution partners can be a tool to leverage that will assist with inventory.



Figure 10 - Switchblade inventory space savings

Conclusion

The critical role of inventory management in a FTTH project cannot be overstated. A project must collaborate with its vendor partners to balance the financial constraint of inventory with supply chain certainty. This effort will help avoid excess inventory which can lead to financial strain such as tying up cash in depreciating assets and the risk of inventory obsolescence, which can negatively affect the P&L statement.

The path forward is working with your vendor to adopt technological advances that help mitigate financial risks to inventory. This includes custom cable design packages to standardize hardware and utilizing 200 μ m fiber technology for increased density to match existing inventory. Innovation in products such as LMHD and WTC cable allow for a reduction in traditional diameters and reel sizes; and AFL's Switchblade offers both space and freight savings.

All of these product innovations impact inventory in a way that helps mitigate inventory-related financial risks while supporting supply chain certainty. ■