Single-Jacket vs. Double-Jacket ADSS Fiber Optic Cable

Carson Joye, Application Engineer, AFL

All-dielectric self-supporting (ADSS) fiber optic cables are used in a variety of outside plant applications. As the name suggests, these cables contain no metallic components and are supported without the need of a messenger wire. These features make ADSS cable very advantageous in electric environments of overhead power lines from low-voltage distribution to EHV transmission. With the wide range of applications comes a variety of ADSS cable designs as well. One categorical design difference is a single-jacket versus a double-jacket cable. This paper will discuss the advantages and typical applications of each of these design types.

A double-jacket ADSS cable design includes a polyethylene inner jacket that surrounds the central core of buffer tubes that house the individual fibers, which are stranded around the FRP central member. Aramid yarn, the strength component that allows ADSS to be self-supporting, covers the inner jacket. A polyethylene outer jacket goes on top of the aramid yarn. AFL's standard ADSS cable families are double-jacket designs.

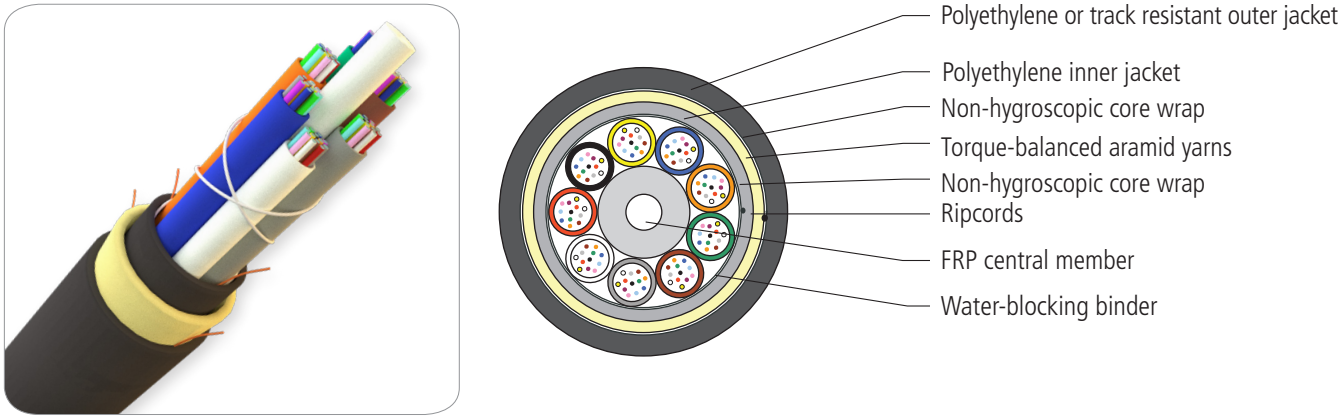

Figure 1: Double-Jacket ADSS Fiber Optic Cable

The double-jacket cable design allows for higher tensile strength with more aramid yarn. For this reason, double-jacket designs are almost always required in transmission line applications where longer pole-to-pole span lengths require greater tensile strength. For electric space potential values above 12 kV, a different outside jacket material is used that is resistant to electric tracking. Referred to as "track-resistant ADSS", these cables are usually double-jacket designs. For transmission lines above 69 kV, the ADSS placement location should be evaluated for electric tracking potential. Contact AFL for further information on track-resistant ADSS cables.

The single-jacket ADSS cable is designed for the typically shorter pole-to-pole span lengths of distribution and sub-transmission environments. With no inner polyethylene jacket, aramid yarn instead covers the core of buffer tubes. For the right application, the single-jacket design can provide a cost-effective option while also reducing the size and weight compared to a similar double-jacket cable. A single-jacket design can also reduce cable prep time for splicing with one less polyethylene jacket to remove.

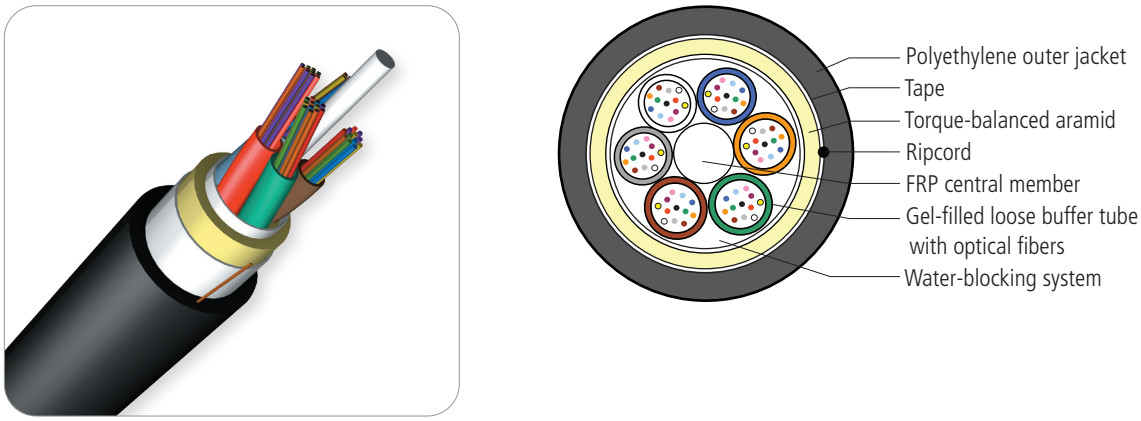

Figure 2: Single-Jacket ADSS Fiber Optic Cable

Traditional double-jacket ADSS cable can be engineered to longer span and heavier environmental loading (e.g. ice and wind) applications. In shorter span environments like distribution lines, a single-jacket design could be the most efficient and effective design.

All fiber networks are unique. Contact an AFL Applications Engineer to determine the best ADSS design for your specific network.