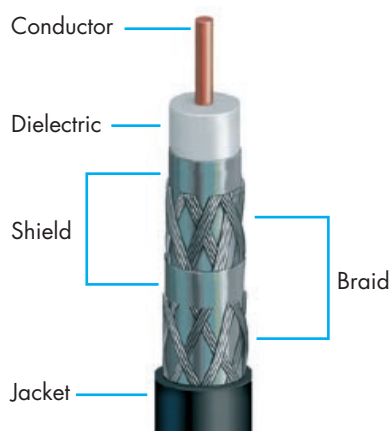


Tech Tips

May 2008



All Aboard!

Just as the conductor on a train makes sure all passengers get to the “end of the line,” the center conductor in a coaxial cable serves to transmit signals to their destination.

Coaxial center conductors may be made of several different materials, including bare copper (BC), silver covered copper (SC), tinned copper (TC), copper-clad aluminum (CCA) and copper-covered steel (CCS). Each material is used for different applications. Conductors also come in solid or stranded varieties. Solid conductors, made of a single conductor, have limited flexibility and should be used in installations where the cable is not subject to repeated flexing. Stranded conductors are multiple small gauge conductors that are together to form a larger conductor. Although the attenuation of stranded conductors is higher than solid conductors, their advantage is flexibility, which is ideal when the cable may be subjected to movement.

Materials

- **Bare copper** is a good general purpose conductor because it transmits all frequencies very well. Bare copper conductors are used in most security installations (CCTV) because it provides optimum performance in closedcircuit video applications. Bare copper conducts well at lower frequencies required by CCTV to offer a high-quality video transmission. Bare Copper also offers very low Direct Current Resistance (DCR).
- Another common type of conductor is **copper-covered steel (CCS)**. The steel core of a copper covered steel center conductor provides extra cable strength, while the copper coating is responsible for transmitting the signals. CCS is used with the higher frequencies of CATV applications, where signals travel on the outer surface of the conductor. This is known as the “skin effect.”
- **Copper-clad aluminum (CCA)** is widely used in applications requiring the conductivity of copper while retaining much of the weight advantages of aluminum. CCA is light weight and is easy to handle and install. The copper on the outside allows for better connections.
- **Tinned copper** and **silver covered copper** are needed when soldered terminations are required, as in a broadcast studio or Central Office environment. Highly trained technicians do the terminations, using specialized techniques and equipment. Because of their metallic composition, silver-copper and tin-copper conductors enable technicians to terminate the cables more effectively. Tinned copper and silver covered copper also offer greater protection from corrosion.