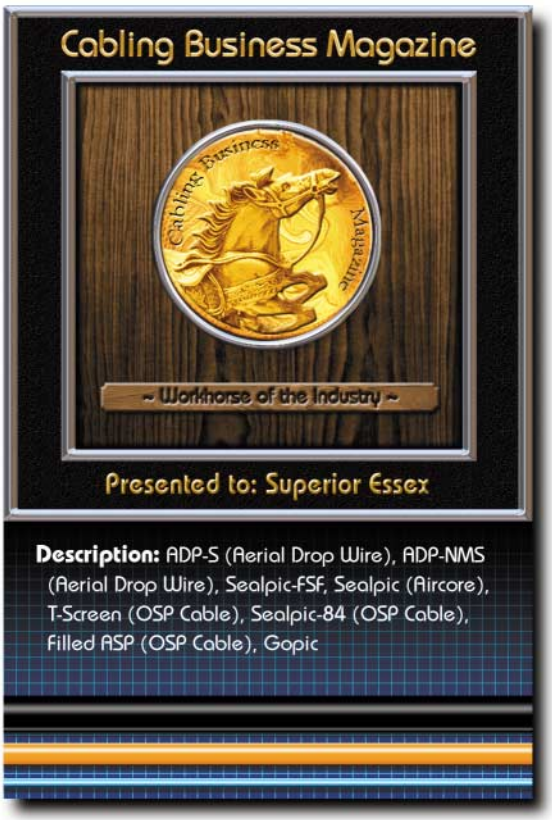
Selecting OSP Copper Cable

An Economical Approach

By Earl C. Scholtens

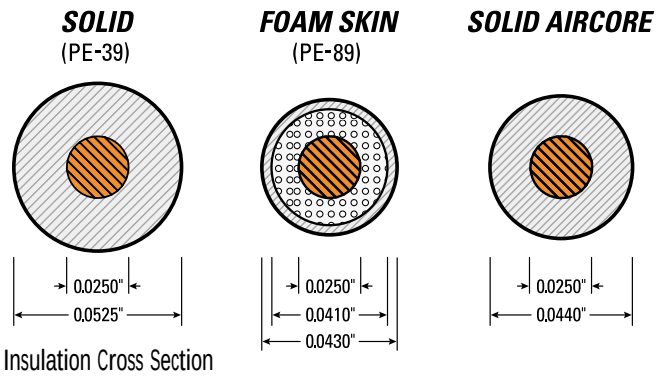


In today's business climate, engineering managers are constantly being asked to curtail budgets or get creative with cost saving measures. Many of these cost savings opportunities exist within the specifications placed on the OSP copper cable. Either out of habit or lack of knowledge, buyers of OSP copper cable routinely miss opportunities to purchase the most cost-effective product for their application. The challenge for these indicators of cable is how to appropriately cut costs without compromising on product quality or performance. To help in this process, this article addresses the top seven cost considerations when making an OSP copper cable selection. First, a caveat. The least expensive cable product may not be appropriate for the intended application and when you are unsure you should check with an expert. Saving a few dollars on the front end can wind up as a costly mistake after installation if the cable does not perform as needed.

1. "Foam-Skin" Insulation versus "Solid" Insulation

Choosing "foam-skin" insulation over "solid" insulation can save between 10 - 15 percent in cable costs. As an example, take a look at the difference between two very common OSP cables, PE-39 and PE-89. PE-39 cables are manufactured utilizing "solid" insulated conductors, meaning the polyolefin insulation is applied to the copper conductor in a single solid layer. PE-89 cables are manufactured utilizing "foam-skin" insulated conductors, meaning the polyolefin insulation is applied in a dual (layered) process. The inner layer of the insulation consists of "foamed" polyolefin followed by an outer solid skin layer. The technology behind the dual insulation process is newer and allows more efficient utilization of the insulation material. Without getting too technical, miniscule air bubbles are injected into the foam layer allow for an overall thinner wall thickness. The reduction in the insulation thickness equates to a reduced core size, which allows for a corresponding reduction in the amount of filling compound, shield tapes and jacket materials used in the cable. Besides the insulation differences, all other raw materials are identical, including the filling com-

Relative Diameter Comparison of Insulated Conductors



Insulation Cross Section

RBOC's have trusted us as their #1 cable supplier for years.

See what we can do for you.

Outside Plant Composite Cable
with Multiple combinations

Outside Plant Coax

Outside Plant CATV Cable

Outside Plant Indoor/Outdoor
Fiber Optic Cables

Outside Plant
Loose Tube Fiber Optic Cables

You may know us as the largest manufacturer of OSP copper cable in the U.S. We've also become a major supplier of OSP fiber optic and coax cable to some of the largest and most demanding telecommunications companies in the world.

Over the past 45 years, SUPERIOR ESSEX has steadily built our reputation for reliability, performance, expertise and an extensive product line customers rely on. Our products' performance is as important as how we do business. *Gain the Advantage* with SUPERIOR ESSEX.

SUPERIOR ESSEX™

Gain the Advantage

770.953.8338
superioressex.com

pound, shielding and jacket materials. In most circumstances PE-89 cables (with foam-skin insulation) are perfectly suitable for the same applications that specify PE-39 cables and the smaller diameter of PE-89 cables make them better suited for use in conduits. However, PE-39 cables are sometimes preferred for installations taking place in areas where there is a high risk of lighting strikes. The solid insulation is more tolerant of voltage surges.

2. Shielding Materials

Differences in shielding can affect total copper cable costs by four to 17 percent. Primarily, there are two different types of shields (rodent resistant and non-rodent resistant) and two

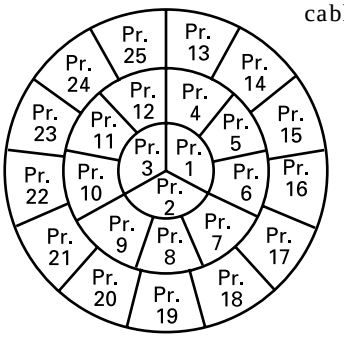
categories of materials (Aluminum/Steel and copper/bronze). The rodent resistant shields provide the most physical protection for the cable but are also the most expensive. They typically range from a 10 mil copper shield to a five-mil bronze alloy shield. The non-rodent resistant shields range from five-mil to eight-mil thickness and are typically constructed of copper, bronze, aluminum and/or steel. In general, the aluminum and/or steel shielding will be the most cost effective option and will provide an adequate level of physical protection and electrical bonding. If you are not concerned about rodent protection, the aluminum/steel shielding is likely to be your least expensive solution.

3. Sheathing (Jacket) Materials

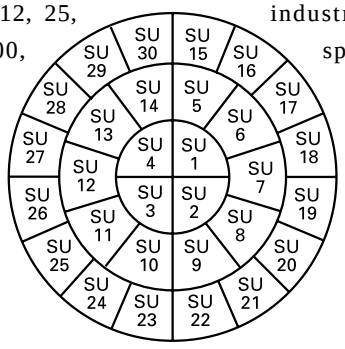
The choice of jacket compound can impact total cable cost up to six percent. The two most common jacket materials used in the U.S. today are linear low-density polyethylene (LLDPE) and polyvinyl chloride (PVC). PVC's are more costly, but are necessary to pass flame (VW1) test requirements. The VW1 requirement is considered important for aerial drop wire applications with some telephone companies. The concern is that a non -VW1 drop wire could easily transfer a flame to the house in the event of a nearby fire. While aerial drop wires represent a legitimate justification for PVC sheathing, LLDPE is a better choice for virtually every other application. Not only is LLDPE lower in cost, it is superior to PVC in durability and water permeability.

4. Pair Counts

The telecommunications industry has standardized on common pair counts for OSP cable. Most OSP cable manufacturers produce and inventory these pair counts. The common pair counts are 6, 12, 25, 50, 100, 200, 300, 400, 600, 900, 1200, 1500, 1800, 2100, 2400, 2700, and 3000 pair. Note that on the larger pair counts, the cable manufacturer can easily produce its work-in-process inventory in sub groups of 100 pairs, which leads to efficiencies in manufacturing and ultimately a lower cable cost. Non-standard cable pair counts such as 10, 18, 20, 30, 75 and 150 pair are more expensive to manufacturer and consequently carry a higher market price (per pair). Non-standard pair count cables are also not typically stocked by distributors and will often require minimum order quantities and have longer lead times. It may be tempting to go with non-standard pair count cable if your application does not require the next higher size of standard pair count cable, but keep in mind the long-term pair-count requirements of the cable. A larger standard pair count cable may eventually be necessary anyway and the cost difference is often small.



25 Pair
(25 Groups of pairs)



3000 Pair
(30 – Super Units of 100 pair)

5. Common Industry Specifications versus Special Requirements

The telecommunications industry has standard industry specifications that apply to OSP copper cable. In the RUS (formerly REA) market place they are known as RUS 7 CFR specifications. In the Bell market place they are Telecordia GR-421-Core or ANSI/ICEA specifications. Cable manufacturing plants are designed around making cable to these specifications. Deviations, such as special printing, packaging, pair configurations and shipping arrangements add cost to the final product.

While most manufacturers are pleased to handle such special requests, customers are often unaware how much their requests are adding to their final costs and would be better off choosing one of the "standard" products.

6. Length Requirements

One way to reduce cable costs is to avoid cut charges by buying full reels or cable "shorts". Distributors and cable manufacturers typically charge a fee of $100 (or more) per cut to cut a cable to a specific length. This charge represents not only the cost of physically cutting a length off of a reel, but also helps to make up for the reduced value of the piece of cable remaining after the cut and includes the cost of an additional reel. Before requesting a specific cut length and accepting a cut charge ask your distributor if he has any short pieces that might meet your needs. Short lengths often are offered at discounts and a longer "short" may be more cost effective than a cable cut to your requested length with an additional cut charge. For example, let's say that the job requires 600 ft. of PE-89 cable and your supplier has a 900 ft. reel in stock. The service charge that you will incur to have your cable supplier make that cut might easily exceed the cost of the additional 300 ft. And a little extra cable is always a plus on a job site. If your distributor does not have short cable available to suit your job's needs ask him to check with the cable manufacturer.

7. Manufacturer Selection

While "first-cost" is the easiest measure of cost savings, the total cost of a project does not end there. The quality of the cable product and its ease of use are important factors to consider in a cost analysis. No manufacturer is perfect and some manufacturing defects are bound to slip through any quality process. However, some manufacturers have earned the reputation for consistently having the best quality and fewest defects. It only takes one occurrence of a defective cable on a job site to erase the initial cost savings of buying a lot of cheaper cable.

The best manufacturers also offer technical service that can help save significant amounts of time and money when situations arise in the field. The bottom line is that choosing your OSP cable products from a top U.S. manufacturer will add up to real cost savings in the long run. **CBM**

Earl Scholtens has spent 30+ years in the telecommunications industry with Contel, Marconi and most recently with Superior Essex in Atlanta. He can be reached at earl_scholtens@superioressex.com.