

## Wind Farm Products

### Fiber Optic Cables for Wind Farms

As the global demand for energy continues to skyrocket, wind farm construction is exploding and with it the demand for state-of-the-art communications systems. Superior Essex offers a full line of fiber optic products to service these needs. Please use the information below as a guide for making informed cable decisions for your upcoming application.

### Wind Farm Application Factors

Several factors must be considered when installing communications cable at a wind farm.

- The threat of lightning, and potential for resulting equipment damage
- Rodents
- Cable product types

### Lightning

Lightning strikes pose considerable risks to wind turbines, which are directly interlinked by communications cables that send alarms, request service and collect statistics over the communications link. Without proper bonding and grounding, a lightning strike potentially could travel along the cable and cause significant damage to the wind turbine.

### Rodent Resistance

Another significant concern is cable damage from aggressive rodents. The images are from an industry standard qualification test for gopher resistance. "Sample 1" is an all-dielectric cable; "Sample 2" is a steel armor cable. The armored cable provides complete protection, while the all-dielectric cable is virtually destroyed. Some companies promote additional Aramid yarns to provide increased rodent resistance. Be aware, this increased protection is measured in minutes or hours – not years.



Sample 1



Sample 2

## Cable Product Options

There are misconceptions that metal-free or all-dielectric cables are required for these applications to avoid potential damage from lightning. Although all-dielectric cables offer the lowest cost and are non-conductive, they do not protect against aggressive rodents. The telecommunications industry has successfully used armored cables for decades in its applications. Properly installed armored cables are bonded and grounded to control electrical energy dissipation and to provide superior rodent protection.

A nylon over-jacket is non-conductive and offers moderate protection against rodents, but is not as effective as steel armor. A nylon over-jacket can be added to most cable designs.

Contact the Superior Essex Technical Support Team at 1-877-263-2818 to discuss your specific wind farm application and the Superior Essex cable product that can give you the best performance and withstand external dangers.

## Non-Armored Cables

### Loose Tube Single Jacket All-Dielectric Cables Series 11

Loose tube all-dielectric cables are designed for use in underground ducts and lashed aerial applications. The loose tube design offers reliable transmission performance over a broad temperature range.



The rugged loose tube design features optical fibers placed inside PFM™ gel\* filled buffer tubes. The core is constructed by stranding the buffer tubes around a central member using a reverse oscillated lay. The core is wrapped with flexible strength members covered with a water blocking tape, then encased with a black polyethylene jacket. Ripcords are included for ease of entry.

### Single Loose Tube All-Dielectric Cables Series 51

Single Loose tube cables offer a low cost alternative to traditional stranded loose tube cables. The single loose tube design offers reliable transmission performance over a broad temperature range.



The rugged single loose tube design features optical fibers placed inside a single PFM gel\* filled tube. The core tube includes up to 8 fiber bundles, each containing up to 12 fibers bound within a color coded binder. The core tube is then helically wrapped with water-blocking strength members, then encased with a black polyethylene jacket. Ripcords are included to provide ease of access to the cable core.

## Armored Cables

### Loose Tube Single Jacket Single Armor Cables Series 12

Loose tube armored cables are designed for improved mechanical and rodent protection in direct bury applications. The loose tube design offers reliable transmission performance over a broad temperature range.



The rugged loose tube design features optical fibers placed inside PFM gel\* filled buffer tubes. The core is constructed by stranding the buffer tubes around a central member using a reverse oscillated lay. The core is wrapped with flexible strength members covered with a water blocking tape, a corrugated steel armor is applied and then encased with a black polyethylene jacket. Ripcords are included for ease of entry.

### Single Loose Tube Single Armor Cables Series 52

Single Loose tube cables offer a low cost alternative to traditional stranded loose tube cables. Armored cables are designed for improved mechanical and rodent protection in direct bury applications. The single loose tube design offers reliable transmission performance over a broad temperature range.



The rugged single loose tube design features optical fibers placed inside a single PFM gel\* filled tube. The core tube includes up to 8 fiber bundles, each containing up to 12 fibers bound with a color coded binder. The core is wrapped with flexible strength members covered with a water blocking tape, a corrugated steel armor is applied and then encased with a black polyethylene jacket. Ripcords are included for ease of entry.

## Additional Product Info

### Nylon Over-Jacket Option

A nylon over-jacket may be added to a dielectric cable to provide protection against rodents, although nylon is not as effective as steel armor. Nylon can be added to most Superior Essex cable designs.

### \*PFM™ Gel

The PFM (Polymer Filling Matrix) gel is a non-sticky water blocking material that possesses unique properties, which reduce the friction between the buffer tube and optical fibers during the tube removal process. This feature results in lower force required for fiber access and faster removal of the tubes from the optical fibers. The PFM gel does not require the use of solvents to clean the optical fibers prior to splicing like conventional gel compounds, which allows for faster installation and clean-up time. Time-study trials conducted by Superior Essex show a 66% reduction in time for the tube removal and fiber cleaning process.