3M Composite Conductors

We’re putting “high performance” in conductors

- Significantly more ampacity
- No rebuilding of existing overhead lines
- Designed for long-term reliability

3M advanced technology offers options for increasing ampacity without increasing structural loads.

3M Composite Conductor Features
- Advanced aluminum composite core
- High-temperature outer strands
- Hard aluminum
- Round or compact constructions
- Low thermal expansion
- High strength-to-weight ratio
- Corrosion resistant
- Available in standard sizes and lengths

Advantages and Benefits
- Significant ampacity gains (1.5 to 3.0 times improvement)
- Outperforms all existing overhead conductors
- No increase in diameter
- Use existing towers
- Environmental solution
- Saves design time and costs
- No new right-of-way
- Extends life of towers
- Avoid tower modifications
- Quick and simple solution

Applications
- Transmission bottlenecks
- Thermal upgrades
- Mountainous areas
- River and lake crossings
- Coastal regions
- Demanding clearance requirements
- National parks
- Scenic areas

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3M Innovation
3M Composite Wire
Reliability is a key requirement in power utility applications. From a materials perspective, this means working with materials that are chemically compatible and thermally and environmentally stable. Starting with high purity aluminum for conductivity, each strand of 3M Composite Wire is reinforced with thousands of ultra-high strength high-purity aluminum oxide fibers; a product of 3M’s leadership in ceramic fibers for 30 years. The result is a wire that improves upon the key properties important for conductor performance.

Composite Wire Features
- High strength (8X aluminum, 1X steel)
- Lightweight (1.2X aluminum)
- Good conductivity (1/2 aluminum, 4X steel)
- Low thermal expansion (1/4 aluminum, 1/2 steel)
- Retains strength up to 300° C
- Low creep (less than steel)
- Excellent fatigue resistance
- No environmental degradation
- High stiffness (3X aluminum)

Environmental solution
In many areas of the world, building new transmission lines is extremely difficult if not impossible. Environmental impact analyses and years of debate only add to the costs. The 3M Composite Conductor can substantially increase the capacity of existing lines by simply replacing the existing conductors with a composite conductor of equivalent diameter. Installation is quick and the ampacity gains large and immediate.

High temperature solution
We combine the new 3M Composite Wire with the most advanced high temperature aluminum alloy available. The result is a solution specifically designed for high-temperature operation. A conductor in which both the core and the aluminum strands contribute to the conductor strength and conductivity and yet remain unaffected by high operating temperatures. A conductor that is easy to handle and install. A conductor without environmental or corrosion concerns. A conductor that provides the highest ampacity gains possible.

Long span solution
Nowhere are the limitations of conventional conductor materials more apparent than in long-span applications. As the span length increases, the steel content required in conventional conductors increases and eventually the material limits are reached. The 3M Composite Conductor offers new solutions for long span applications. The outstanding strength-to-weight ratio of 3M’s composite core combines with the conductivity and low thermal expansion to dramatically reduce sag and tower loads.

Reliable solution
3M is a global leader in power utility solutions and in the development and commercialization of innovative advanced materials. The composite conductor has been subjected to a wide range of tests including thermo-mechanical characterization of a 230-meter test span. The same test span also survived winds estimated in excess of 160 km/hr during the recent “Storm of the Century” in France. 3M has partnered with industrial leaders to provide the total solution, from finished conductor to accessories and hardware. We are dedicated to providing you the customer with the most innovative and reliable solutions.

Product design assistance
Our qualified engineers are ready to assist you in all aspects. By providing us with some key information about your application, we can quickly provide feedback on the performance gains for you to review.