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# The power behind electricity

OHUG Product Catalogue

Edition 01

**Section 17**

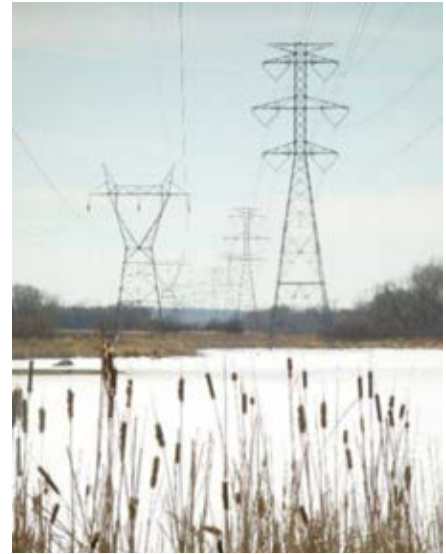
# Overhead Conductors

Overhead Conductors

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# 3M™ Aluminium Conductor Composite Reinforced (ACCR)

In today's complex world, protecting grid integrity is a growing challenge. Aging infrastructure is burdened with changing power flows as renewable generation is integrated and traditional sources are retired. All of this is happening amid growing environmental and regulatory concerns. 3M offers a fast and potentially cost-saving way to increase capacity, achieve greater clearances and meet today's strict reliability standards – helping you keep the lights on for years to come.



## Advanced technology to protect your grid

To help solve today's toughest transmission challenges, 3M developed an advanced, high-capacity overhead transmission conductor: 3M™ ACCR (Aluminium Conductor Composite Reinforced). It is engineered to maximize the capacity of existing lines, helping you provide a more robust and flexible grid. Reconductoring with 3M™ ACCR can help you alleviate the scheduling, budgetary and regulatory risks of upgrading lines in areas with dense populations, strict permitting requirements or limited land availability.

3M ACCR is designed to replace ACSR or ACSS on existing structures at the same tensions and clearances, giving you up to twice the ampacity without the risks of a major construction project. Your line can be back in service fast, within budget, and with minimal community and environmental impacts. And 3M ACCR has proven its reliability in installations around the world – so you can be confident in the integrity of your transmission lines, even in challenging environments.

## Maximize the value of your grid

Running more amps on existing structures can reduce ratepayer impacts from major upgrade projects while delivering more value to shareholders from existing assets. Upgrading with 3M ACCR can also help relieve transmission constraints, simplify compliance with regulatory standards, enhance reliability and provide a robust system to support your advanced grid investments.

Most importantly, 3M ACCR's dependable operation helps protect the integrity of your grid – for long-term value you can count on.

# The Power



## What is 3M ACCR?

This high-capacity transmission conductor has a high-strength, lightweight aluminium matrix core. The outer, current-carrying strands are composed of a hardened aluminium-zirconium alloy. 3M ACCR's core and outer wires are both helically stranded for greater strength and conductivity.

3M ACCR is similar in construction and dimensions to ACSR. 3M ACCR, however, has a higher strength-to-weight ratio and lower thermal expansion than comparably sized steel core conductors – so it is lighter and sags less, even at higher operating temperatures. This in turn allows higher ampacities at equivalent tensions and clearances. 3M ACCR retains its performance over decades of high temperature use and is stable in a wide range of environmental conditions.

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Inside the technology  
3M™ Aluminium Matrix Core



# More Amps More Confidence

## Maximum ampacity with less sag

Compared to the same diameter steel core conductor, 3M™ ACCR can offer:

- > Up to 2 times the ampacity or more
- > Less thermal expansion, for less sag at high energy levels
- > Higher strength-to-weight ratio
- > Operating temperatures up to 210°C continuous and 240°C emergency



### Maximum ampacity with less sag

With 3M ACCR, you make no compromises on your tension and clearance standards. Its reliability has been demonstrated around the world, with:

- > Large capacity increases at the same clearances, tensions and mechanical loads
- > Corrosion resistance without coatings or barriers around the core
- > Durability similar to ACSR, even when operated at high temperatures over long periods in extreme environments
- > Over a decade of successful, reliable operations

### Fast and easy to use

3M ACCR was designed as a replacement for ACSR and ACSS to quickly and dramatically increase capacity on existing structures – while minimizing lengthy construction and permitting processes. Core stranding, hardware and construction procedures are similar to those for ACSR and are familiar to installers. And with shorter installation times, ACCR can help you get back to service more quickly.



### Lower total project cost

By eliminating the need for expensive new towers, land acquisitions and other factors, upgrading with 3M ACCR can offer substantial savings over ACSR and ACSS – even at a higher conductor cost-per-kilo meter. For many thermal upgrades, ACCR can give you the high-performance, cost-effective solution you've been looking for.

### Commitment to quality

3M ACCR and its accessories have been rigorously tested and verified to ASTM, IEEE and ANSI specifications, both in the laboratory and in the field. Test conditions included extreme temperatures, heavy icing, heavy loading and corrosive atmospheres. In all cases, 3M ACCR performed up to specifications and showed that the design coefficients accurately predict performance in the field.

# Tackle the toughest jobs with confidence using 3M™ ACCR!



## Changing clearance requirements

NERC reliability standards and clearance requirements over highways, railroads or other shipping lanes may require upgrades. 3M ACCR can provide more capacity with no change in wire diameter or tower load, and often with reduced tension. Because 3M ACCR sags less, line clearances can be significantly improved while delivering the same or greater power, even at high temperatures.

## Densely populated or underbuilt areas

In areas that are densely populated, upgrading with 3M™ ACCR can increase capacity by reusing existing structures with less disruption to the community, and without needing to site new structures. Transmission lines can also be upgraded without having to impact distribution lines underbuilt on the same structures, which means less expense and system disruption.

## Environmentally sensitive areas

Transmission lines through environmentally sensitive areas require extensive and lengthy reviews and debate before approval. Upgrading with 3M ACCR allows existing structures to be used, avoiding or simplifying those reviews. The appearance of the line does not change.

## Short timelines

3M ACCR can help you avoid construction projects, with their long lead times and permitting delays. Your project could be done faster, relieving constraints and getting the power flowing in record time.







# Transmission Challenges



## Long spans/river crossings

Rivers and gorges are among the most difficult challenges, because it may not be possible to put a tower in the middle of the water or to change out existing towers for taller ones. The low sag, high strength and low weight of 3M ACCR can allow longer spans while giving you the capacity increase you need and maintaining or improving clearance and mechanical loads on the existing structures.

## Heavy ice or wind loads

A high strength-to-weight ratio and modulus make 3M ACCR ideal for areas that experience high mechanical loads such as icing. In some cases, a smaller conductor can be used, reducing the conductor profile and mechanical loads during major wind and ice events. 3M ACCR can increase reliability during demanding loading conditions.

## Corrosive environments

Because both the wire and the core are made from aluminium, 3M ACCR is resistant to corrosive environments such as high-pollution areas or the damp, salty air near seashores. Unlike steel- or carbon-polymer-core conductors, no special coating is required to avoid chemical interaction between the core and the conductor.







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