

# High Temperature Overhead Lines Conductors

SAME LANE - DOUBLE STRAIN



Linking power grids to sustainability

## Linking the future

As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology. Through two renowned commercial brands – Prysmian and Draka – based in almost 50 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures, and achieve sustainable, profitable growth.

In our energy business, we design, produce, distribute and install cables and systems for the transmission and distribution of power at low, medium, high and extra-high voltage.

In telecoms, the Group is a leading manufacturer of all types of copper and fibre cables, systems and accessories – covering voice, video and data transmission.

Drawing on over 130 years' experience and continuously investing in R&D, we apply excellence, understanding and integrity to everything we do, meeting and exceeding the precise needs of our customers across all continents, at the same time shaping the evolution of our industry.



## What links power grids to sustainability?

**From Asia-Pacific to the Americas, and from Europe to the Middle East to Africa, Prysmian cable solutions sit at the heart of the development of power grids worldwide, helping major utilities in transmitting and distributing power to their customers.**

**Unmatched in our manufacturing capabilities and with an unwavering commitment to R&D, we design, produce and install low, medium, high and extra-high voltage underground and submarine cables and systems, along with network components and value-added engineering services.**

**Always aware of the need to minimize our impact on the planet, we're constantly driving innovation in our industry, aiming to optimize supply chain processes, reduce total cost of ownership for our customers and help them achieve sustainable, profitable growth.**



# Prysmian supports utilities to face new power carriage challenges

**The steady increase of electric energy consumption and population density together with the necessity to integrate the energy generated by renewables drives the modern Utilities to deal with network capacity upgrade issue.**

The construction of new line is indeed often very critical due to lack of available lands, difficulties to get the permissions and environmental restrictions. The high temperature conductors for overhead lines are designed especially to solve this problem, allowing an upgrade of the existing line increasing the ampacity from 1.5 to 2 times by replacing only the conductors, guaranteeing a more convenient solution in terms of total cost of ownership.

**Thanks to the use of this innovative technologies our customers can now have conductors with mechanical and dimensional characteristics specular to standard ACSR or AAAC but without any decline if exposed to high working temperatures.**

**Another important benefit brought by high thermal limit conductors is the lower thermal expansion coefficient that allows a reduced sag at high temperatures.**



# Prysmian solution

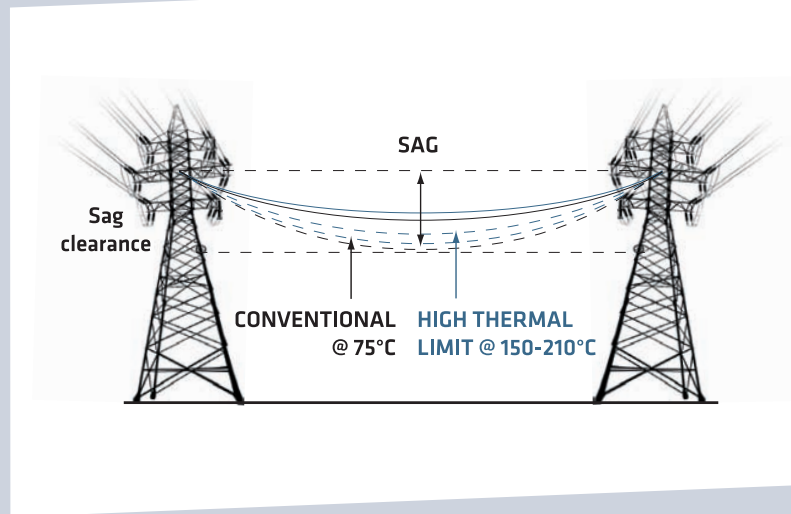
Our special featured conductors use a combination of Aluminium Clad Invar (a special Fe-Ni alloy with very low thermal expansion coefficient) for the core, and super thermal resistant Al-Zr alloy for the conductive layer.

## Application field

These conductors are especially suitable to replace ACSR conductors in short and middle spans lengths in all the orographic conditions (plain, hill or mountains).

## Benefits against traditional conductors

- ✓ Ampacity increase up to 2 times using the same conductor's cross-section
- ✓ SAG Reduction
- ✓ Fully compatible with ACSR or AAAC network
- ✓ Total cost of ownership reduction for the Utility



## Prysmian experience

Prysmian has helped solving network constraints issues providing HT Overhead Lines Conductors for many customers such as:

- Terna: Italian Leading TSO
- Tiwag: Austrian Leading DSO

Every project using HTL conductors requires a tailor-made approach.

Prysmian supports its clients in finding the best way to upgrade existing lines:

- Designing the appropriate conductor
- Designing the line architecture
- Designing all the necessary fittings
- Providing installation support and supplying

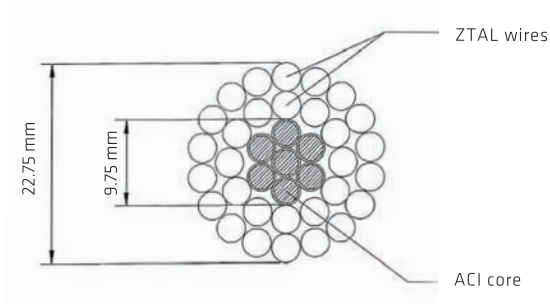
*To get any further information on the projects already realised and on Prysmian ultimate OHL solution, get in contact with our OHL experts using the contacts list at the end of the leaflet.*

# Overhead Thermal Resistant Aluminium Conductors

## Aluminium Clad Fe-Ni Reinforced

The following technical data refer to an existing project.

Prysmian Group designs and produces customised solutions on projects' requirements.



Technical data		
Conductor code	-	249-AT3/58-ACI20SA
Standard	-	UX LC3914
Stranding	-	7x3,25+30x3,25
Diameter of Alu.Clad Fe-Ni wire	mm	3,25 +/- 1,5%
Diameter of ACI core	mm	9,75 +/- 1,5 %
Diameter of ZTAL aluminium wire (AT3)	mm	3,25 +/- 1,0 %
Diameter of complete conductor	mm	22,75 +/- 1,0 %
Outer layer clockwise	-	RIGHT
ACI core cross-sectional area	mm <sup>2</sup>	58,07
Total ZTAL aluminium cross-sectional area	mm <sup>2</sup>	248,87
Total cross-sectional area of compl. conductor	mm <sup>2</sup>	306,94
Unit weight of ACI	kg/km	395
Unit weight of ZTAL aluminium	kg/km	688
Unit weight of complete conductor	kg/km	1083 +/-2 %
Calculated breaking force	daN	9782
Nominal transition temperature	°C	119±5
Modulus of elasticity for ACI	kN/mm <sup>2</sup>	138,50
Modulus of elasticity for conductor	kN/mm <sup>2</sup>	72
Coefficient of linear expansion for ACI	1/°Cx10-6	4,7
Coefficient of linear expansion for conductor	1/°Cx10-6	16,4
DC resistance at 20°C (max.)	ohm/km	0,11068
Allowable continuous operating temperature	°C	180
Allowable operating temperature temporarily	°C	210

#### MATERIALS:

- Thermal resistant aluminium alloy: AT3 (ZTAL: Super Thermal Resistant Aluminum Alloy) according to EN 62004

- High temperature Fe-Ni alloy: ACI (Aluminum Clad Invar) EN61232 20SA + customer specification

Nominal values subjected to manufacturing tolerances.

# Linking power grids to sustainability

**Prysmian Group** Viale Sarca 222, 20126 Milan, Italy

**Massimo Comina**

**Power Distribution Business Director**

Tel.: +39 02 6449 9311

Email: [massimo.comina@prysmiangroup.com](mailto:massimo.comina@prysmiangroup.com)

[www.prysmiangroup.com](http://www.prysmiangroup.com)

**Prysmian**  
Group

