

## Why choose Bekaert?

### The wire drawing and coating specialist

With more than 130 years of experience in coating technology and steel wire transformation, Bekaert has the flexibility and technical know-how to create any steel wire no matter what shape, composition or mechanical characteristic.

### Experience in producing offshore applications

Bekaert has longstanding experience in providing a wide range of products for the offshore industry. Whether it concerns power transmission, oil extraction, gas mining, or even telecommunications, Bekaert products are key contributors to sustainable, safer and more cost-effective operations.

### Continuous innovation

Bekaert is continuously investing in state-of-the-art equipment to allow its project teams to develop and innovate. To support the development of new coatings and technologies Bekaert has an in-house engineering department which develops its own machinery and process equipment as well as pilot production lines.

## A-magnetic armoring wire

for submarine power cables

**The full a-magnetic solution that combines excellent corrosion resistance with good processability**

Bekaert a-magnetic armoring wire is a heavily galvanized, austenitic stainless steel wire used for protecting three phase submarine power cables.

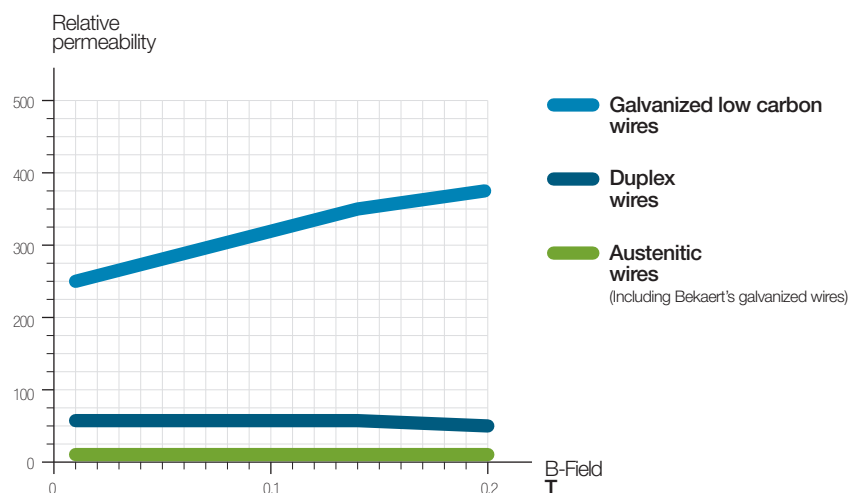
### Benefits

- the most effective a-magnetic armoring solution
- the same corrosion resistance in marine environments as the classic hot dip galvanized low carbon wires
- good processability

### Reducing the energy losses in the armoring

Galvanized stainless steel has several important benefits of which a-magnetic behavior is the most important one. Stainless steel has a low permeability which reduces energy losses in the armoring by the cable's magnetic field. Consequently, this property significantly increases the cable's efficiency without needing to interfere with the cable design as is the case with other armoring solutions.

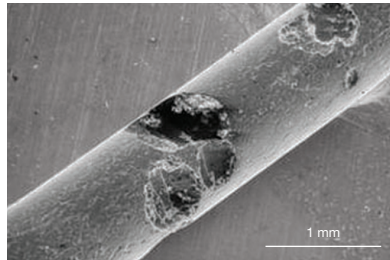
The graph below represents the relative magnetic permeability of the different steel grades used in 3 phase subsea cable armoring. The measurements were done at 50Hz in a test setup. The B-values of the magnetic fields applied in the measurements correspond to values expected in this application.



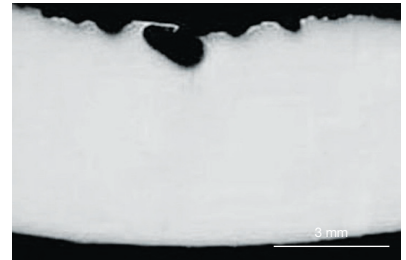
## Protecting your investment against the marine environment

### a. The importance of crevice and pitting corrosion protection

Crevice corrosion usually occurs in gaps a few micro meters wide, in which circulation of the corrosive medium (electrolyte) is not possible. Operating conditions like crevices and stagnant sea water can accelerate the crevice and pitting corrosion of uncoated stainless steel. Once the steel gets affected, the dissolution sets in really fast, as re-passivation is almost impossible in this oxygen poor environment.



AISI 300 series austenitic stainless steel after 1 year of exposure in sea water.



Pitting corrosion on uncoated AISI 300 series stainless steel wire after less than 1 year of exposure in sea water.

### b. The benefits of galvanized austenitic stainless steels

A heavy zinc layer on austenitic steel offers an excellent resistance to pitting and crevice corrosion, making it perfect for marine applications. The combination of these features offers a much more predictable and reliable coating lifetime and performance compared to uncoated austenitic stainless steel solutions. Even when the zinc layer gets damaged, the surrounding zinc will sacrifice itself serving as a sacrificial anode and protecting the underlying stainless steel. Basically this wire offers the same corrosion protection in marine environment as the classic hot dip galvanized low carbon wires.

For more information about corrosion and stainless steels in sea water read the research report of Prof. Em. Dr. Ir. J. Defrancq at [www.bekaert.com/amagnetic](http://www.bekaert.com/amagnetic)

## Good processability to match your specific cable design

- Mechanical properties comply with the EN 10257 norm and the specification grade 65 ( $R_m = \sim 700\text{MPa}$ )
- Class A heavy zinc coating according to EN 10244-2.
- Welding is possible, while maintaining a tensile strength of  $\sim 700\text{MPa}$ . Only the ductility is slightly decreased.



Excellent coating adhesion: wrap test on a 6 mm wire

	$R_m$ (MPa)	Elongation (%)	$R_{p0.2}$ (MPa)
Hot dip galvanized amagnetic wire	743 ± 6	48	440
Galvanized low carbon wire	814 ± 11	6	656
Hot dip galvanized amagnetic wire after welding	719 ± 12	12	604
Galvanized low carbon wire after welding	563 ± 14	2	473

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