



Benefits

vs ARMoured CABLE

- > **Better Impact performance.**
- > Reduced Diameter.
- > Lower Weight.
- > Longer cable length on standard drums.
- > Improved flexibility.
- > Same Fire performances.
- > Same resistance to oils/chemicals.
- > Same resistance to effects of water.
- > Easier installation (easier spliceability).
- > Lower sensitivity to ground stray currents and harmonics (e.g. in installations close to electrified railway lines).
- > Lower screen/armour losses.

Replaces traditional metal armour, giving even better impact performances, with lightness and ease of installation typical of unarmoured cables.

vs UNARMoured CABLE

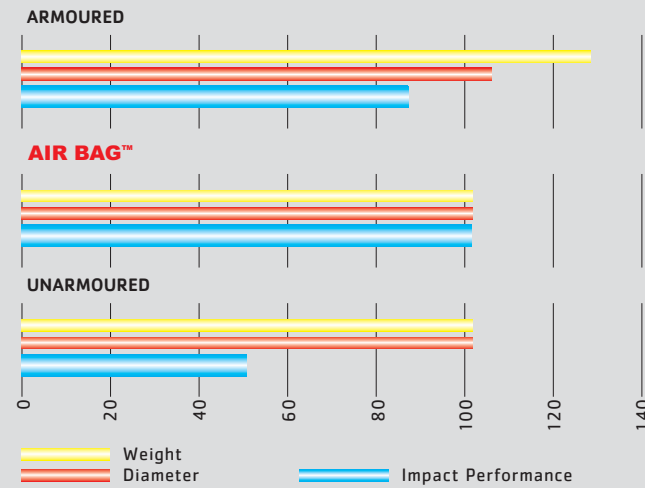
- > **Double Impact performance.**
- > Diameter: no significant variation.
- > Weight: no significant variation.
- > Same flexibility.
- > Same Fire performances.
- > Same resistance to oils/chemicals.
- > Same resistance to effects of water.
- > Same ease of installation.

Gives a dramatic improvement in mechanical resistance, with no significant variation in terms of weight and rigidity.

Accessories



The **AIR BAG™** range is fully compatible with traditional joints and terminations. The installation procedures are the same as for traditional accessories.



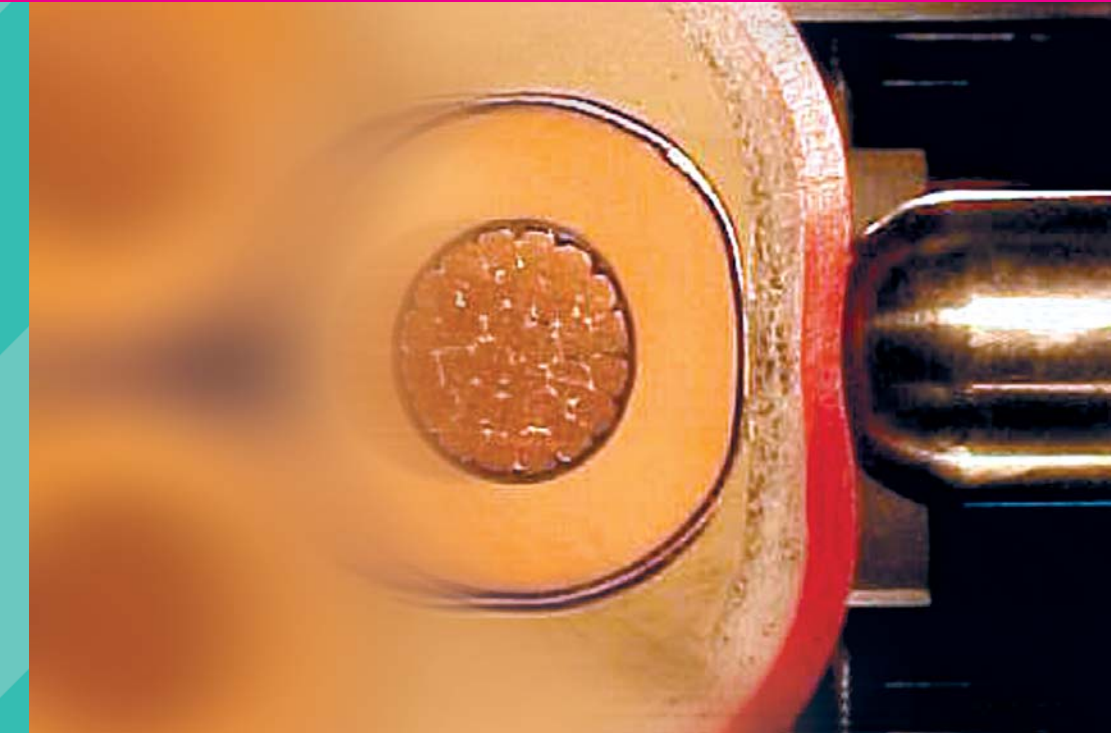
AIR BAG™ Range

Voltage	Insulation	Additional optional performance on request
FROM LV TO HV	PVC PE LSOH EPR XLPE	LSOH (IEC 1034, IEC 754) FLAME RETARDANT (IEC 332.1) FIRE RETARDANT (IEC 332.3-C)

Certifications



UNI EN ISO 9001



AIR BAG Cable System

AIR BAG™
KABEL SYSTEM

A revolutionary system
for all energy cables

Protection Against Mechanical Damage

Cables can be damaged in many different circumstances and in virtually all operative environments mechanical abuse can often damage cable insulation and protective screens, leading to a premature and unexpected failure and, in any case, to a dramatic decrease of long term reliability. The economic consequences of this and the disruptive effects on service continuity are easy to quantify.

Industry's response has been traditionally to protect cables with metal armoring (Applied in tapes, wires, etc) or to install them with additional external protection such as covered trays, pipes etc. Both solutions involve significant additional costs and longer installation time. In particular the traditional metal armoured cables show a significant disadvantage in terms of weight, flexibility, difficult jointing compared to a standard unarmoured cable.



In industry



During laying and digging operations



In civil works

The AIR BAG™ Revolution

Prysmian has designed and patented a revolutionary solution that provides better mechanical protection than traditional metal armoured cable maintaining the functional advantages of unarmoured cables. **AIR BAG™** is a radically new design that absorbs the kinetic energy of a shock by its deformation. In this way no residual energy is left to damage the "sensitive" parts of the cable such as insulation and screens. Metal armoring doesn't behave so efficiently: part of the energy of a shock is transmitted to the inner layers of the cable, potentially prejudicing the insulation's integrity.

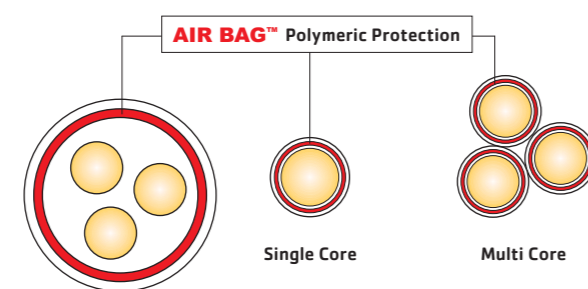
The level of protection achieved with **AIR BAG™** and, by consequence, the reliability is substantially improved. Additionally, the cable is much lighter, flexible and easy to install than a traditional armoured cable.

Thanks to **AIR BAG™** versatility the range of applications is wide and covers residential, infrastructures, industry and utilities, always giving the same benefits in terms of reliability and weight reduction.

Design

The **AIR BAG™** system is a mechanical protection that can be applied to multicore and single core cables. Depending on specific applications different architectures are possible.

The polymeric extruded layers work together as a system and provide a very effective defence against impact.

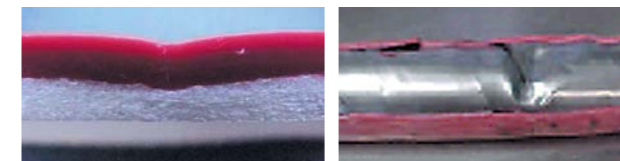


How it works



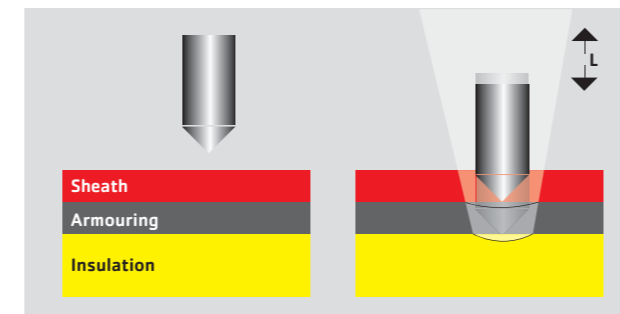
Test device

French specification for extruded HV cables (Spec. HN 33-5-52 cl.5.3.2.1.).



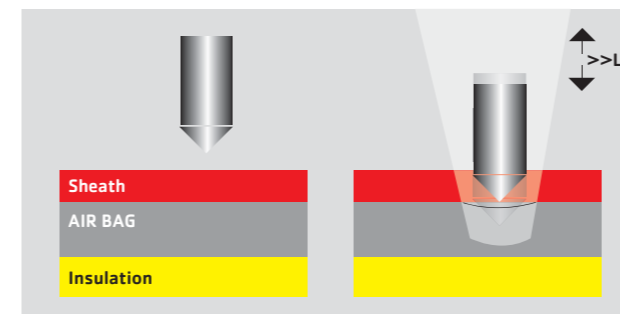
The **AIR BAG™** special extruded layers act like a shock absorber. Metal armoring can damage the inner layers.

Metal Armoured



Metal armour has a much higher Modulus, thus impact energy is dissipated with a lower deformation (**L**) and a high dangerous specific force is transmitted to inner layers of the cable.

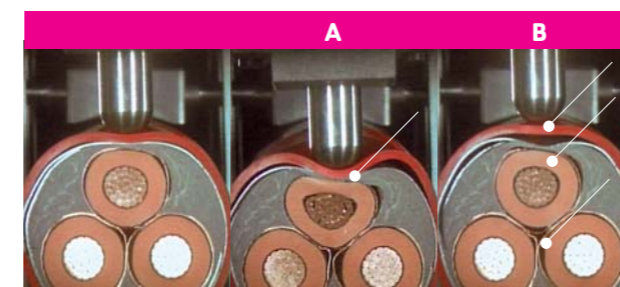
AIR BAG™



AIR BAG™ acts as a shock absorber.

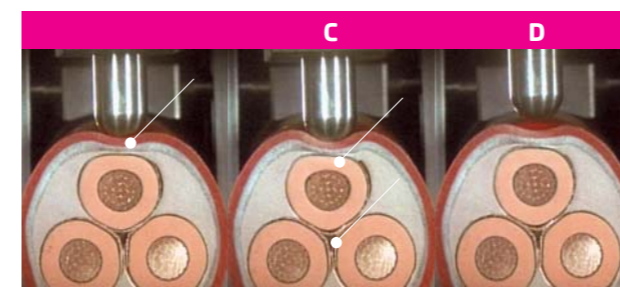
Impact Test

Steel Tape Armoured



70 joule impact at 2000 frames/second. Pictures taken with high speed camera in Prysmian R&D labs by the "Politecnico di Milano" University, Milan Italy. 20kV 3x150 mm² Copper conductor, EPR insulation.

AIR BAG™



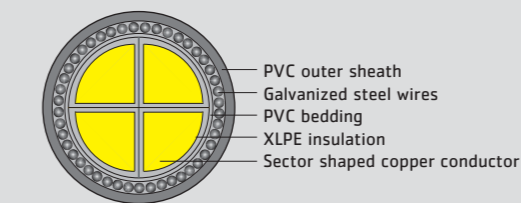
A Steel tape armour shows high deformation concentrated in a small area. **B** Due to permanent deformation of metal armour, cable cores cannot recover initial shape, insulation of conductor is permanently damaged, copper screens have been badly detached. **C** **AIR BAG™** acts like a shock absorber. **D** **AIR BAG™** avoids core damage.

The cables: typical designs

Low voltage (0.6/1 kV)

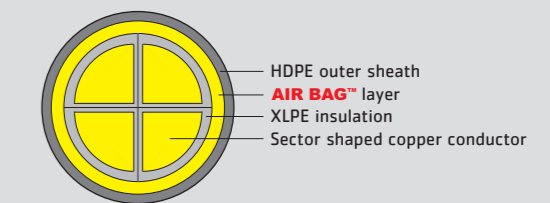
Cable type: SE40FR - BS5467

Steel Tape armoured
4x95 mm² Cu sectoral



Cable type: SE40 (AR)E

AIR BAG™
4x95 mm² Cu sectoral

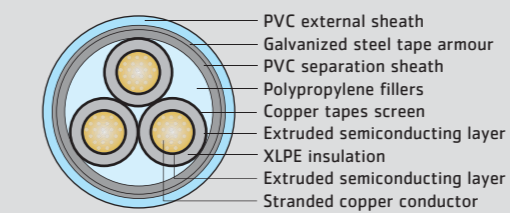


	ARMURED	AIR BAG	DELTA
Overall diameter - mm	40.6	38.4	-5%
Cable weight - kg/m	5.4	3.8	-29%

Medium voltage

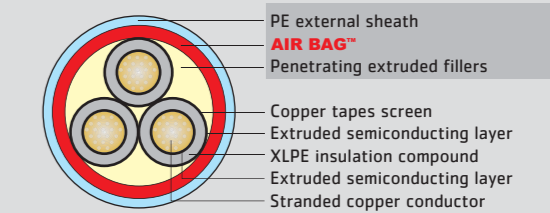
Cable type: RE4H10RNR - 22 kV

Steel Tape armoured
3x300 mm²



Cable type: RE4H10 (AR)E - 22 kV

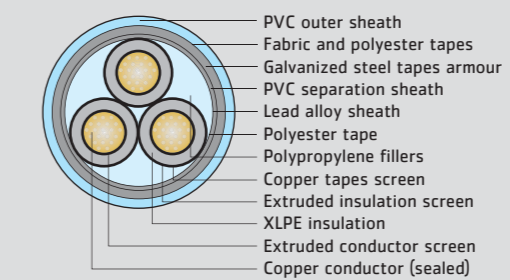
AIR BAG™
3x300 mm²



	STEEL TAPE ARMURED	AIR BAG	DELTA
Cable weight - kg/m	15.5	13	-16%
Standard reel length - m	250.0	300	+20%

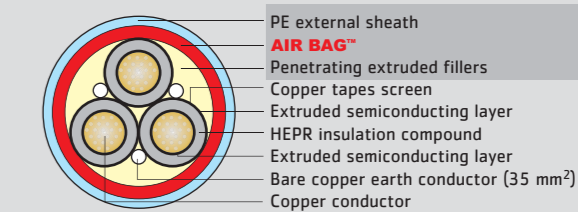
Cable type: RE4H10LRNR - 11 kV

Steel Tape armoured - Lead alloy sheath - XLPE
3x185 mm²



Cable type: RG7H10 (AR)E - 11 kV

AIR BAG™ - HEPR insulation
3x185 mm²



	STEEL TAPE ARMURED	AIR BAG	DELTA
Cable weight - kg/m	18.6	10.6	-43%
Standard reel length - m	250.0	450.0	+80%