



As a result of Prysmian's worldwide focus on Research & Development, we have invented many breakthrough compounds which are used on our wire and cable products. These compounds are the result of our experience with both materials science and cable manufacturing technology. Because we are uniquely positioned as both a compound developer and a cable manufacturer, our proprietary cable compounds have been developed, not with the manufacturer, but with the end-user in mind.



Our compounds include the following:

### Afumex™

Prysmian introduced our proprietary Afumex™ insulating compound in 1979 as one of the first Low Smoke Halogen Free (LSHF) compounds available in the wire and cable industry. Since then, Afumex™ has grown to a family of compounds which include thermoplastic jacketing materials for use on low and medium voltage cables, as well as thermoset insulating compounds for use on low voltage cables. Standard jacketing and insulating compounds may use chlorinated products to aid in fire retardancy.

When burned, these chlorinated compounds release toxic gases which, in enclosed environments such as tunnels, buildings, or industrial plants, can lead to fatal consequences for anyone who may be enclosed in the area. In fact, most deaths from fire are not caused by burns, but by suffocation from gases released when chlorinated or other toxic compounds are burned. A primary example of our Afumex™ insulating compounds can be found on our EcoSafe™ products used for the Telecommunications industry. And the list of products using these compounds will continue to grow because human safety is always our number one concern.

### Airbag™

Prysmian's newest compound is a polymeric replacement for armor. Our Airbag™ compound consists of a foamed, abrasion-resistant polymer which acts like a shock absorber for mechanical impacts. The result is a product which is even more effective than traditional steel armor at protecting direct-buried underground power cables. The Airbag™ system allows for extraordinary cost savings with respect to both armored designs and cable-in-conduit systems proving, once again, that Prysmian is on the leading edge of cable technology.

### EPRotenax™

Prysmian developed Ethylene Propylene Rubber in the late 1950's in cooperation with the Milan Polytechnic Institute and Montedison. Our proprietary EPR compound is formulated with just the right blend of ingredients to optimize the mechanical and electrical properties. Time after time, test after test, Prysmian's EPR

has been shown to have lower losses, greater tensile strength, better dielectric properties, and higher voltage breakdown strengths than all of our competitors. Please refer to the chart below for a sampling of the EPRotenax™ mechanical and electrical data versus currently accepted industry standards.

	Prysmian EPR	Typical**	AEIC/ICEA***
<b>Electrical Characteristics:</b>			
Dielectric Strength: A.C., R.T.,V/mil	1000	695	500 (min)
Impulse Strength (un-aged): R.T., V/mil	2000	1625	800 (min)
Power Factor: 90 °C, %	0.2-0.3	0.75	1.5 (max)
Dielectric Constant: 90 °C	2.7-2.8	3.0	4.0 (max)
Insulation Resistance Constant ("K")	100,000	50,000	20,000 (min)
<b>Mechanical Characteristics (un-aged):</b>			
Tensile Strength - PSI	1850	1200	700 (min)
Tensile @200% Elongation - PSI	1500	1000	N.R.*
Elongation at Rupture - %	300	250	250 (min)
Modulus, psi, min. @ 130°C	300	200	N.R.*

\* No Requirement

\*\* Based on an average of published competitor data for Type III EPR insulation

\*\*\* For Type III EPR insulation rated at 105°C

# COMPOUNDS

## **Voltalene™**

Prysmian has been using commercially available Cross-Linked Polyethylene (XLPE) and Tree-Retardant Cross-Linked Polyethylene (TRXLPE) compounds since their availability. These compounds are scrutinized by Prysmian's QA department and are held to the highest standard through our stringent material specifications. Once a compound is approved for use in our cable, it becomes part of our Voltalene™ family of XLPE and TRXLPE compounds. Currently, Prysmian has approved Dow 4201 XLPE, Borealis 4201 XLPE, Dow 4202 TRXLPE, and Borealis 4212 TRXLPE as part of our Voltalene™ family.

## **Prysmian SR™**

In the year 2000, Prysmian introduced our proprietary Superseal™ low voltage product which featured a unique new layer of self-repairing compound. When the outer jacket of the cable is punctured, the inner material, which we call Prysmian SR, flows into the wounded area and “heals” the cable insulation. The viscosity of this material has to be just right, finding the right mix between flowing to fill the cut, but not flowing so much that the material will escape the cable altogether. The Prysmian SR material is the result of many years of trial and error which included long-term aging tests, manufacturing trials, and actual installations. The result is a compound which is easy to work with, requires no additional clean-up, and, most importantly, is effective at repairing even the most aggressive cable damage.

## **Strandseal®**

During the mid to late seventies, older generation polyethylene cables were failing at a very high rate after only a few years in service. After much research, the cable industry determined that the combination of water and voltage stress was shortening the life of these insulating compounds. Since that time, Prysmian has dedicated ourselves to the goal of blocking water from the cable core. Many of our most innovative cable designs, including our Doubleseal™, Tripleseal™, and Superdri™ designs, make use of our proprietary strand-blocking compound which we introduced in 1977 when Pirelli invented the concept of strand-blocking. To this day, our Strandseal® strand-blocking compound maintains the highest water-blocking standard in the industry, withstanding over 15 p.s.i. of water pressure for well over an hour. Prysmian's Strandseal® compound remains stable at both high and low temperatures, does not crack or become brittle after aging, is highly adherent to conductor wires, and is compatible with all other cable compounds. Strandseal®: The first, and still the best.