CABLES WITH SMOOTH WELDED ALUMINIUM SHEATH

Industrial process

The smooth welded aluminium sheath consists of an aluminium tape, longitudinally applied over the cable core, shaped around it and welded. The outer polyethylene sheath is firmly bonded to the aluminium sheath resulting in a cable with a solid impervious water barrier and excellent resistance to fatigue strain. The application and welding of the aluminium tape, and the extrusion of the polyethylene are carried out through a tandem process on the same line, which undergoes continuous video recorded inspection ensuring effective quality control. Extensive tests have proven that the water-tightness and resistance to corrosion of the smooth welded aluminium sheath cable meets the most stringent standards. Depending on the short circuit requirements, the welded aluminium sheath can be complemented with copper wires.

Benefits

Small Smaller Lighter Longer

The metallic sheath plays a key role in the design of High Voltage underground cable systems, as it must satisfy essential electrical and mechanical functions to ensure the correct operation of a cable. Cables with lead alloy sheath - the first solution adopted in the development of metallic shielding technologies - provide all necessary guarantees in terms of technical characteristics: mechanical protection, fluid and moisture tightness, and short circuit current carrying capability. However, the main disadvantages of cables with a lead alloy sheath are weight - especially from the installation perspective – and, in specific instances, fatigue strain. Cables with Corrugated Aluminium Sheath (CAS) - the first lead substitution technique adopted in the evolution of metallic shielding technology – have a significantly reduced weight when compared with cables having a lead alloy sheath. Conversely, CAS cables have the disadvantages of not only a lower transmission capacity, due to the presence of an air gap under the corrugations, but also a larger diameter and accordingly shorter delivery lengths.

Prysmian know-how and technological competence have led to the development of a smooth welded aluminium sheath design, an innovative solution, which effectively combines the benefits of both lead and corrugated aluminium sheaths yet minimizes their disadvantages, resulting in a cable with lighter weight, reduced diameter and bending radius – with a comparative longer length. The smooth welded aluminium sheath also guarantees excellent electrical and mechanical performance, full fluid tightness and compliance with even the strictest environmental requirements.

Total Quality Commitment

The Prysmian High Voltage Systems business unit is characterised by a competent and experienced approach to global turnkey solutions with improved research, engineering and manufacturing resources. Within the Pirelli Group, there are manufacturing facilities dedicated to the production of HV cables and accessories systems in 12 countries in all five continents and a single business unit, which gathers all critical functions in a co-ordinated management structure with common operative policies. The main advantages this organisation can offer are: great manufacturing flexibility, strong engineering capabilities to solve, develop and even anticipate the most innovative and demanding needs of the market, installation services with extensive experience, and total quality commitment. The Prysmian brand has always been a guarantee for the supply of products and services based on worldwide common quality standards.

Standards and recommendations

National and international standards provide design guidelines for High Voltage cables, however most HV cable systems are custom designed to suit also the specific environmental parameters and operating requirements of a particular route and loading conditions, taking into account the thermal, thermo-mechanical and electrical performance necessary to ensure reliable system operation throughout service life, which naturally will vary considerably between different applications and locations. Prysmian products are designed to meet the projected service duty and to comply with national and international testing requirements. Type approval references are given against each product type available.

Besides, international scientific bodies – like IEC and Cigré – develop relevant standards, technical recommendations and guidelines within their activities in the field of High Voltage. Prysmian relies on a long-standing tradition of participation and a strong presence within such bodies, acquired thanks to its undisputed expertise developed over scores of projects accomplished anywhere in the world.

References

Track Record

<table>
<thead>
<tr>
<th>U_{m} (kV)</th>
<th>Length of cable manufactured</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to and including</td>
<td>(km, in excess of)</td>
</tr>
<tr>
<td>420</td>
<td>150*</td>
</tr>
<tr>
<td>245</td>
<td>110</td>
</tr>
<tr>
<td>170</td>
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*For U_{m} class 420 kV, an additional 80 km are under manufacture (2006).

Track Record

- Madrid-Barajas Airport: 50 km (420 kV, Cu 1500 mm², 37 km)
- Red Electrica de Espana: 38 km (420 kV, Cu 1000 mm², 32 km)
- Terna SpA: 50 km (420 kV, Cu 2000 mm², 20 km)
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- Wienstrom GmbH: 380 kV Cu 1200 mm² (Vienna, 3 km)

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Product evolution

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Prysmian business locations and manufacturing sites as well as operation units are certified according to ISO 9001 and ISO 14001 Quality Management System standards for their specific activities and products, and environmental quality standards.

Standards and recommendations

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