A.1.5.

Development of 275 kV XLPE cable with aluminum laminated tape for radial moisture barrier

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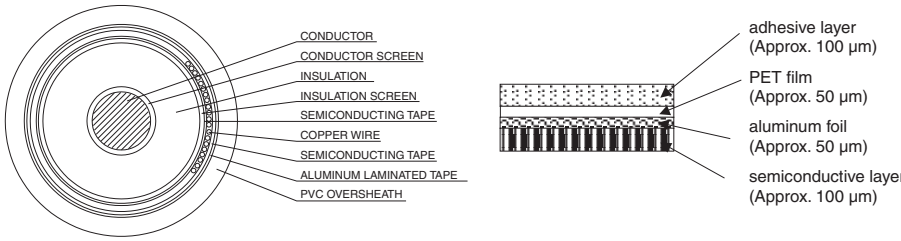
This paper describes the development of 275 kV XLPE-insulated and PVC-sheathed cable with aluminum laminated tapes for the radial moisture barrier, which are longitudinally applied around the core.

Lead laminated tapes have been widely used as the moisture barrier for XLPE cables up to 154 kV class and in Japan. However, according to the recent movement toward environmental care and cost reduction, aluminum laminated tapes have been employed since 2000 at the Kansai Electric Power Co., Inc. As for the construction of 275 kV XLPE cables, Metallic sheathes, such as corrugated aluminum and stainless sheathes, have been employed in Japan from viewpoints of firm mechanical protection and perfect moisture barrier, giving the top priority to the reliability. After reviewing the field experiences and cost comparison, The Kansai Electric Power decided to employ aluminum laminated tapes instead of the metallic sheathes for 275 kV cables, as well. An aluminum laminated tape consisting of four layers as shown in Fig.1 was finally selected in order to achieve good bending performance and strong adhesion of the tape at longitudinally overlapped portion.

Various tests on thermo-mechanical performance of the cable, simulating mechanical stresses during cable laying and in service, were conducted and it was confirmed that the cable has excellent mechanical performance. The newly developed 275 kV cable with the aluminum laminated tape for moisture barrier is firstly employed for Sannomiya Line having route length of approx. 8km, and is now under construction.



(a) Cross-section of Cable (b) Aluminum Laminated Tape

Fig. 1 Cable Construction