

Communication AII-4

Câbles moyenne tension isolés au polyéthylène avec conducteurs en aluminium massif, écrans et neutres en aluminium.

Polyethylene insulated medium voltage cables with solid aluminium conductors, aluminium screens and aluminium neutrals.

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Abstract - Polyethylene insulated middle-voltage three-core cables with solid aluminium conductors, aluminium screens and aluminium neutrals are manufactured since 1968. The main feature of these cables is lack of semi-conducting conductor screening between the solid aluminium conductor and plastic insulation. This construction necessitates $p > 0$ pressure of plastic insulation on solid aluminium conductor during whole life-time of the cable and much smaller surface roughness of solid aluminium conductor than specified in standards. These two requirements were fulfilled and until the end of 1983 about 6500 km three-core cable was delivered to the purchasers.

1. Introduction

In Hungary in the second half of the fifties and in the first half of the sixties a lot of paper insulated, aluminium sheathed power cables was produced. Though in middle-voltage range they could not oust the lead sheathed cables, in the second half of the sixties, when plastic insulated middle-voltage cables were developed, the prices of the new cables were adapted to those of aluminium sheathed power cables. Thereby our company was pressed to design plastic insulated middle-voltage cables with lowest price. Good experiences with aluminium sheath as neutral led up to introduction of aluminium tape insulation screening and aluminium wire neutral. Similarly excellent experiences with solid aluminium conductors generally used for low-voltage plastic insulated cables in Hungary led up to the use of circular solid aluminium conductor for middle-voltage cables. The main structural feature of these cables is the extrusion of the plastic insulation directly over the solid aluminium conductor without a semi-conducting conductor screening /1/, /2/. The structure of these cables is made possible by shrink fit occurring between the solid aluminium conductor and the plastic insulation after it is extruded over the solid aluminium conductor /3/.

In this paper we do not want to deal with the aluminium tape screening and aluminium wire neutral because it was done in detail in a conference paper /3/. Experiences gained during the last 15 years confirmed the favourable test results published in the conference paper /3/ with respect to corrosion of the aluminium tape screening and aluminium wire neutral. Short circuit test carried out with 7,5 kA current and 0,6 s duration specified for the Hungarian network was passed by the joint of these cables. Nevertheless can be manufactured with copper tape screening and copper wire neutral too although this practice is not usual in Hungary.