

Cables with smooth welded aluminum sheath.

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ABSTRACT

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 provide all necessary guarantees in terms of technical characteristics. However, the main disadvantages of cables with a lead alloy sheath are weight.

On the other hand, cables with corrugated aluminium sheath have a significantly reduced weight when compared with cables having a lead alloy sheath. But, it has the disadvantages of not only a lower transmission capacity, due to the presence of an air gap under the corrugations. Also a larger diameter and accordingly shorter delivery lengths.

For that reason, we developed manufacture the mass of cables having smooth welded aluminium sheath.

KEYWORDS

Smooth welded sheath, Metallic sheath, Special process, Short circuit requirement

1. Introduction

Most HV cable systems are custom designed to suit also the specific environmental parameters and operating requirements of a particular route and loading conditions. Cables with smooth welded aluminium sheath is minimized other type metallic sheath(lead alloy sheath, corrugated sheath) disadvantages, resulting in a cable with lighter weight, reduced diameter and bending radius with a comparative longer length. The application and welding of the aluminium tape and the extrusion of the polyethylene are carried out through a special process on the same line, which undergoes continuously 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.

In this paper, we deal with production and certification of smooth sheath cables.

The illustrated in Fig.1 show in section for cables.



Fig 1. Cables with smooth welded aluminium sheath

2. Development of smooth welded cable

2.1 Manufacture process

Basically, there is a different manufacture process between smooth welded and corrugation welded, lead alloy welded.

This facility is consists of P/O, strip tool, extruder for adhesive PE, extruder for inner or outer sheath, T/U.

It means metal sheath and outer sheath have a special process on the same line. If metallic sheath and extrusion line process operate individually, wrinkle is generated at surface of metal sheath by winding cable. In order to prevent wrinkle occurrence, cable drum design is important. So we design over 21times of drum longitude multiple. Typically, drum longitude multiple is over 18times for other type sheath cable.



Fig 2. Strip tool for smooth welded metal sheath

For the reliable quality cable, eddy-current instrument is essential. This device can check welding condition of metallic sheath. Also, metal and outer sheath are to be adhesive. Because of that, the extruder for adhesive PE is located between strip tool and extruder for outer sheath.