

## CONNECTION TO MV CABLE LONGITUDINAL ALUMINIUM SCREEN

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### ABSTRACT

French medium voltage XPLE cable is designed with a longitudinally applied aluminium foil screen bonded to the oversheath. A specific device, called "**screen plate**" has been developed to interconnect the screens.

This paper presents the results of the last tests performed since 2011 to evaluate the real performances of the connexion to the aluminium foil with the screen plates according to the following parameters: current, installation procedures, mounting tools and clamping device.

The previous results showed that it is possible to reach a current up to 45A after 1500 cycles of electrical ageing test. Others investigations have been necessary to guarantee a current of about 25A (240 mm<sup>2</sup> copper) and 40A (630 mm<sup>2</sup>).

### KEYWORDS

Screen plate, longitudinal aluminium foil screen, test

### INTRODUCTION

#### Cable and device presentation

##### Earth connection system

ERDF (French DSO) earthing system for medium voltage network is based on impedance earthed neutral system. Moreover, the screens of the 3 phases are always interconnected in accessories (Fig.1) and terminations of the link, except for big cross-sections (630 and 1200 mm<sup>2</sup>). In this case, the 3 screens are interconnected and single-point bonded to limit the screen current.



Fig. 1: Interconnection of the screens

#### MV Cable design

For 35 years, French medium voltage XPLE cable is designed with a longitudinally applied aluminium foil screen bonded to the oversheath.

At the same time, a specific device, called "**screen plate**" or "cheese grater", has been developed to interconnect the aluminium cable screens.

Today, screen plates are described by the French standard NF C33-014 [1] and included in all MV

accessories. The device consists of a tinned copper plate with pikes, which exists with 3 different sizes (Fig. 2), to cover all the cross-section range (25 to 1200 mm<sup>2</sup>). The pikes are designed to ensure the contact of the screen plate with the aluminium foil screen.

A tinned copper bread has to be welded on the copper plate to realise the interconnection and/or the screen continuity with the second cable.



Fig. 2: Different models of screen plate

#### Installation

The connection steps include:

- Making longitudinal cuts of the aluminium laminated screen and the oversheath,
- Opening out the aluminium screen bounded to the oversheath,
- Inserting the screen plate under the aluminium screen,
- Tightening the oversheath on the screen plate with 2 non-magnetic stainless steel collar-ties, installed in 2 layers (Fig. 3).



Fig. 3: Screen plate installed on the cable