

## CONNECTION TO MV CABLE ALUMINIUM SCREEN

Christophe **TOURCHER**, Electricité de France Recherche et Développement (EDF R&D), (France), [christophe.tourcher@edf.fr](mailto:christophe.tourcher@edf.fr),

Members of **SYCABEL**, (France),

Roger **TAMBRUN**, Electricité Réseau Distribution France (ERDF), (France), [roger.tambrun@edf.fr](mailto:roger.tambrun@edf.fr),

### 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 results of tests to evaluate the real performances of the screen plates according to different parameters: current, quality of device and installation, nature of cable oversheath, and thickness of aluminium screen.

First results show a limit at 10 amps for PVC oversheath, which satisfies the needs of MV links with rated current under and up to 400 A. For PE oversheath, the limit could reach 30 amps, but others investigations are necessary to validate this value.

### KEYWORDS

Screen plate, aluminium foil screen, MV cable, 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 30 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 screens.

Today, screen plates are described by the French standard NF C 33-014 and included in all 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 copper 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 copper plate under the aluminium screen,
- Tightening the oversheath on the copper plate with 2 non-magnetic stainless steel collar-ties (Fig. 3).



Fig. 3: Screen plate installed on the cable