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New designs for MV accessories: *cold-shrinkable transition joints and evolution of separable cable connectors*

CHATTERJEE S., DE RIDDER E., CARDINAELS J., Euromold Nexans, Belgium

**Abstract:** To join polymeric cables, cold-shrinkable technology is now fully developed and readily accepted. To be able to use such a cold-shrinkable joint on paper insulated cable, transition kits are needed to seal and protect the paper cores and to provide the necessary stress-control.

This paper describes the development of a transition joint using all cold-shrinkable components for the transition kit and for the joint itself.

Separable connectors form the link between the distribution cable network and the equipment. These products therefore are affected by changes in both fields, like: evolution in the design of MV-distribution cables, size reduction of modern switchgear, more universal connector kits, need for additional functionality etc. In response, the design of modern separable connectors is evolving.

The status of recent developments is presented.

**Keywords:** medium voltage, cold-shrinkable joint, separable connectors, insulation, cable design

## 1. Introduction

Development of medium voltage prefabricated cable accessories has come in stages in conjunction with the cable and equipments they were connected to in the MV distribution network.

With the advent of polymeric cable and compact switchgear, resin and tape joints were replaced with slip-on prefabricated ones and live terminations with separable cable connectors.

Continuing of evolution in technology has now brought new cable accessory concepts to suit the demand of the growing and new emerging market.

Cold-shrinkable technology is one of these new concepts that is gaining ground fast over the other existing prefabricated cable accessories particularly for joints and terminations.

However unlike joints, separable cable connectors have retained largely the slip-on concept since the beginning but now have broadened their concept

**Résumé:** Le concept de jonction « rétractable à froid » pour câbles synthétiques est bien accepté. Son application comme transition entre câble papier et câble synthétique nécessite un kit de transition qui étanche et protège les phases du câble papier.

Cet article présente le développement d'une jonction de transition utilisant des composants rétractables à froid pour le kit de transition et pour le corps de jonction.

Les connecteurs séparables assurent la liaison entre le réseau câble de distribution et l'appareillage. Ces produits sont sujets aux évolutions dans deux domaines : l'évolution du concept des câbles HTA et la réduction de taille des cellules. Des développements de connecteurs séparables plus universels et avec fonctionnalités supplémentaires sont demandés.

**Mots clés:** moyenne tension, jonction rétractable à froid, connecteurs séparables, isolation, concept de câble

and scope in product design, functionality and application to adapt to the market need. In this paper we will describe the latest development in cold-shrinkable transition joint and evolution of separable cable connector.

## 2. Cold-shrinkable transition joint

Most of the paper-insulated MV cables serving in our networks today are three-phase design; whereas modern polymeric MV cables in Europe are mainly single phase. When for repair or network extension purposes a connection between both types of cables is needed, a transition joint is required. Traditionally such a joint was built using tape technology, or more recently also heat-shrinkable technology, but both methods are rather cumbersome and time consuming and quality depends too much on the skills of the installer.