



# JICABLE'07

## Rapporteur's Session Report

### **B.3 SESSION : INDUSTRIAL & SPECIAL CABLES**

Chairman : F KRÄHENBÜHL, NEXANS-CORTAILLOD - Switzerland

Rapporteur : J-Ch TOURAINE, Prysmian Energy Cables & Systems - France

This session which includes six papers was dedicated to Industrial and Special cables. All presented items have followed the same guide line : How to increase safety, reliability and performances of special cables in harsh environments : mechanical and thermal performances, fluid behaviour, fire propagation, fire resistance and low smoke emission.

Three main topics were presented :

- Technologies of cross-linking by irradiation (B3.1)
- New compounds and optimized designs for fire resistant safety cables (B3.2 and B 3.3) and fire retardant cables for tunnels and frequently populated public areas. (B3.4, B3.5)
- Original power cable design for Oil, Gas and Petroleum applications (B3.6)

B3.1 : The author described cross-linking technologies of cables by electron beams (EB) and gamma rays ( $\gamma$ ). EB irradiation, gives good mechanical and chemical resistance for various polymers as polyethylene, some rubbers and thermoplastic elastomers. The technology was described and compared with other cross-linking processes. The  $\gamma$  rays applied on cable drums were described for some special cables.

B3.2 : For tunnels and populated publics areas, halogen free safety circuits are used in order to guarantee the people evacuation. The author described a new ceramising compound used together to silicone rubber. When burned, it turns into solid ashes with good mechanical and electrical performances, suitable for power and communication cables and cable joints. Furthermore, the product is low smoke and don't emit acidic gases.

B3.3 : For safety circuits in Australia, fire resistant rely on mechanical support like mica/glass or metallic barrier. In this paper, the author presented an original composition that converts from polymer to ceramic when subjected to fire, useable as well for thermoplastic or cross-linked materials. This patented technology allows fulfilling the FR tests even without the mica/glass tape.

B3.4 & B3.5 : To reduce the secondary effects of fire, it's common to use Halogen Free (HF) cables to reduce smoke and acidic smoke. In B3.4, were presented and described three cable designed for fire retardant applications as tunnel installation and OGP industry : The first one is an EHV with a special outer HF protection, the second is a compact HF optical fibre and the last a flexible HF offshore cable able to resist to oil attacks. B3.5 described two MV cables with good mechanical and fire performances thanks to nanofillers in the sheath.

B3.6 : This paper detailed the development and evaluation of a new design of cable for OGP application where high mechanical stresses are applied. The new design provides increased mechanical protection without the use of metallic armour while also improving flexibility by a composite protection which also protects the cores from hydrocarbon. This new design allows the installers to install longer length without splice.