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Tailor-made medium voltage cables

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Medium voltage cables are often designed in a "standard" way that is they are alike disregarding who manufactured them.

There are good reasons for this, accessories should fit and the end user should not have to bother about who produced the cable. Medium voltage cables are today standard products.

However there are some medium voltage cables that do not yield the best when adapting standard design rules. Universal Cables is one type of cable that is not designed according to standard rules. Universal Cables is a part of a cable system that is operative in many countries mainly in Europe. The system has been presented before, attached see an article from Cired 97 where the Universal Cable System was presented.

The system has developed further since 1997 and what we would like to present at JICABLE 2003 is the way of looking at cable design and the way of using the properties of the materials in the cable.

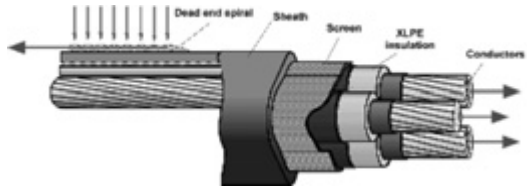
In order to optimise the overall performance of the cable one has to look at the material properties for all ingoing components, i.e.:

The conductor is subjected to strain in the case of a self suspending aerial cable, so the material has to be chosen carefully taking into consideration maximum allowed strain, cold flow properties etc.

The insulation is also subjected to mechanical forces, both axial and radial.

The grip between conductor and conductor screen must be controlled.

The electrical properties of the insulation under mechanical stress must also be optimised.



And so on…

The total cable performance is depending on the actual use of the cable. For a Universal Cable, which is primarily designed for aerial use, important properties are:

Low weight (gives low sag and long spans)
Great strength (high breaking loads and long spans)
Small diameter (long lengths on drums)
Easy handling (short building time)

Cable design must be for optimising of the total performance for the actual use rather than using standard design rules. Material knowledge must be good in order to achieve the best out of each selected material in the cable.

This way of looking at cable design can also be adopted to other types of special purpose cables.

The subject of our presentation would be about these issues, with focus on getting the most out of every cable component and material for best overall performance in the actual use.