



UTILISATION OF CERAMIZING MATERIALS IN FIRE RESISTING CABLES AND ACCESSORIES



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SAFETY CABLES: **WHY?**

Maximum Security in tunnels and heavily populated public areas.

Due to the tragic incidents seen in several tunnels during recent years across Europe, we had to re-examine the performance of materials under fire conditions.

... The requirement for safety cables and systems is more demanding now than ever.

1) Fire performances of cables

In case of a fire, saving human lives may depend on the quality of a single piece of insulated conductor.

Cables that fulfil these fire performances are designated as safety cables.

Safety cables are used for:

- o Energy distribution...
- o Data transmission, fault detection...
- o Loudspeaker systems etc..!

The design of cables with these high fire capacities have to be built using specific compounds and employ special cable operations.

Following various considerations, and tests in fire conditions, we found that the utilisation of Silicone compound as an insulation material over copper conductors combined with a new ceramifiing © bedding compound, resulted in excellent fire performances.

The merging of these two materials which ceramizes, when exposed to fire, will harden and form compact layers.

The combustion residue from the burned Silicone compound, have also very good electrical values.

In consequence this type of insulation is ideally suitable in cables for energy but also for audio, data-transmission and security control systems.

2) Fire performances of cable accessories

The mechanical characteristics of the ceramized combustion residue of silicone are stable and enable us to construct cable junctions that can withstand the required fire conditions and ensure functional integrity during a fire.

They are compatible to the cables characterised in the prevent description.

3) Composition of the Safety cables

A) Insulation

A special silicone compound is used which ceramizes when hit by fire.

The extrusion of this compound can be handled like other non-ceramizing silicone compounds.

The cross linking occurs in the salt bath. We are able to extrude cables in sizes and types of conductors (plain, rope or stranded) from 0.50 up to 630mm².

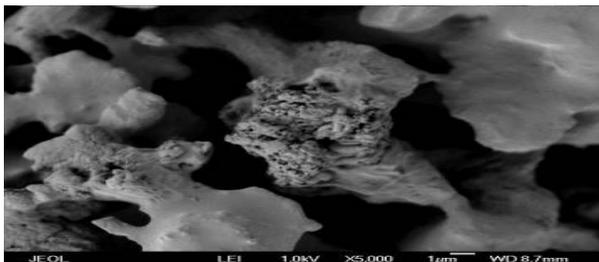
What happens when the insulated cables are hit by fire? The ceramization of the silicone occurs even under temperatures of 700 – 1000°C.

It becomes a tubular layer of char around the conductor. A mechanically stable and less fragile ceramic, comes from the combination of inorganic fillers and the microscopic mineral fibres, as a result of combustion-fusion of parts of the compound.

In the future also as ceramifiing © thermoplast compound.



Picture 1: In this state the result is comparable to concrete.

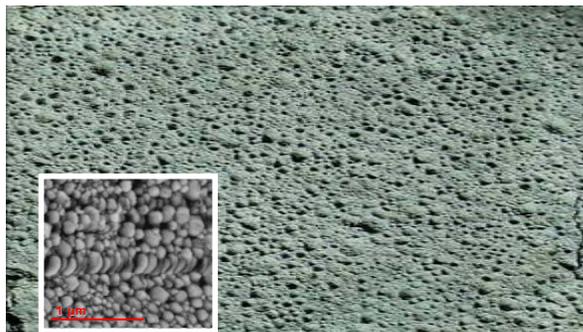


Picture 2: Detail view x 5000.

B) Bedding

In a similar manner, the new kind of ceramifiing © thermoplast bedding compound acts as a fire/heat barrier.

The controlled degree of swelling, the resultant multiple micro bubbles and the hard ceramized ash, means that this compound is well-defined for this application.



Picture 3: Detail of ceramized bedding compound