



## A NEW SPECIFICATION TO CHECK CABLE SHEATH RESISTANCE TO TERMITES



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### ABSTRACT



*Termites are xylophagous insects well known for the spectacular damage caused to wooden buildings or structures.*

*The distribution surface of these insects has spread widely from the initial warm climate zones.*

*Electrical equipment does not escape termite attack. We do not know exactly why termites gnaw the underground cable jacket in places. Several assumptions can be suggested: obstacles, soil softness, magnetic field, etc.*

*The paper describes the adopted approach, the outline of specification and results of investigation tests made on raw materials used on MV French cable.*

*The results show that sheath resistance depends on the hardness of the sheath instead of the density of the compound.*

### KEYWORDS

Termites, specification, density, hardness, environment

### INTRODUCTION – CURRENT SITUATION

EDF purchasing department used to buy MV cables with an option called "anti termite". These cables were essentially supplied for the south and southwest areas of France.

Manufacturers add master batch in the PVC or PE sheath compound in order to make it "anti termite".

However, paradoxically, no specification existed to check the efficiency of this option. EDF, the French electricity utility, asked its R&D branch to think about this lacuna and to propose a new specification in order to check the resistance of cable sheath against "termites' attack".

### THE PROBLEM TO SOLVE

The elaboration of a new test, representative of the conditions in nature to check the cable jacket is quite difficult. The major reason is to be able to give results in a short time and not after long months period (even years).

Above all, EDF R&D verified the number of faults due to termites attacks on the metropolitan MV network. The result was that **the service experience does not currently indicate** this kind of problem.

These preliminary items have to be considered to imagine a test **economically reasonable** and **technically representative**.

The EU directives are tighter and tighter and the use of chemical products is increasingly more restricting regarding health and environmental matters. So, this work about a new notion "termites resistant" instead of "anti termites" is essential not only for utilities but also for manufacturers.

The question of the cable sheath resistance to termites thus quickly arose with the manufacturers. Their opinion resulted in wondering about the manner of withstanding the termites attacks: increasing of the sheath hardness, addition of insecticide products or addition of repulsive products.

### A LITTLE BIOLOGY –TERMITES IN FRANCE

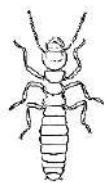
#### generalities

Termites are social insects of the Isoptera order. They eat deadwood normally. Xylophagous insects adapt to their environment and do not hesitate to attack anything containing cellulose. Termites can thus cause significant damage in particular to buildings or structures using wood.

In France, six species of termites are referenced to date. Among them, five species of underground termites belonging to the *Reticulitermes* genus. Their distribution is widespread. Today, only the areas of the North-East of France seem to be unaffected.

They are often called "white ants" but do not have anything to do with these insects.

Termite colonies are organized into morphological and functional casts : workers, soldiers, larvae, nymphs and two types of reproducers : neotenics (reproductive nymphs) and from swarmer allates.



#### Distribution of the termites in Metropolitan France

The maps which follow specify the areas covered by termites and in particular the two species which will be used to check the "termite resistance" of the LV and MV cable sheaths: *Reticulitermes Santonensis* and *R. Grassei*.