

## AIDIMA

*Furniture, Wood and Packaging Technology Institute, Valencia, Spain*

### **CADIX- Advanced Technology Sensor for remote biodegradation detection in wooden structures**



CADIX is an electronic warning system for the wireless detection of hydrothermal biodegradation conditions in wood for constructions, buildings and other applications and it detects the physical biodegradation of the wood due to the presence of xylophage insects, mainly termites. CADIX is the result of research developments during the last years at AIDIMA's laboratories. Biological activities of wood attacking fungi and insects have been investigated and following the observations physical and chemical models for biodegradation activities have been developed.

*Fig.1. Advanced technology sensor*

Since wood is a common building material in our houses, early detection of biodegradation or conditions favourable for biodegradation is important in order to maintain the wood in good conditions. Future problems with wood in construction can be avoided by treating wood with chemicals or by substituting degraded wood. The high costs of building, purchase and maintenance of houses are increasing the need for keeping an eye on the quality of the wooden elements. So far no reliable detection methods and risk alarm systems for wood biodegradation in buildings and houses have been developed.

Wood in buildings is exposed to insect attacks like termites and woodworms. These attacks reduce the mechanical resistance and may cause collapse of the whole building. Rigorous termite attacks threatens buildings, residential districts and even whole villages.

Due to the fact that termites make no exit holes they do not show external signs of their attacks. Their presence can only be observed when the wood collapses due to the deterioration of the mechanical resistance. For this reason early termite attack detection with CADIX is primordial for the protection of wooden structures.



*Fig. 2 & 3 Termite attack. Wooden beam destruction by Termites*

Wood is mostly exposed to fungal rot when the humidity conditions in the wood are undesirable. Detection and treatment of these unfavourable conditions by prevent fungal attack.



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CADIX consists out of a central electronic control unit, programmed with adaptative algorithms and wireless detection sensors in the wooden structure for monitoring insect attacks and hydrothermal conditions. Insect appearance or unfavourable hydrothermal conditions detected by one of the sensors activates remotely the CADIX alarm at the central control point.



*Fig 4. Central alarm system*



*Fig 5. & 6. Cadix sensor's easy and wireless installation.*

So far, not any kind of device capable to detect all types of degradation agents –insects and fungi– inside the wood and to warn for conditions susceptible for their appearance has been available on the market. CADIX small size and fast and easy wireless installation makes it suitable for using it in all kinds of buildings and houses

The CADIX sensor system is applicable in all types of buildings or houses where monitoring of the hydrothermal biodegradation conditions of the wood is needed. The system allows an early detection of biodegradation and termite attack. It can be used is in the construction sector, in structural elements (beams, columns, ...) and also in decorative elements (doors, wood paving, windows, stairs, furniture, wooden art pieces).

With CADIX, you will have the security that the wood in your house will be under surveillance at any moment. It will reduce the termite attacks and the time absorbing and expensive manual inspections to detect them.

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