# NEW CONNECTOR FOR CONCRETE AND WOOD MIXED STRUCTURES

TECNOLOGIA PATENTADA

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## RESUM

The present invention refers to a connection system of mixed concrete-wood structures formed by at least one connector comprising: a head that anchors the bolt to the concrete and which in turn consists of a clamping head and a body of larger diameter with the function of a distribution washer; and another body formed by a neck without thread, a threaded zone, and a self-drilling tip.

The dimensions of the elements comprising this invention will be determined by the characteristics of the structures they connect.

The main innovation of this invention is that the dimensions of the washer prevent the concrete from being crushed and, therefore, prematurely depleted. In addition, it is very easy to assemble the connection system, which has a high strength, transmits the stresses between the concrete slab and the wood structure efficiently and increases the flexural strength characteristics.

The system for the connection of mixed concrete and wood structures developed is useful for the rehabilitation of structures involving wooden beams supporting a concrete slab, as well as for new constructions such as framing, slabs, footbridges and bridges.

Companies interested in acquiring this technology for commercial exploitation are sought.

## AVANTATGES I ASPECTES INNOVADORS

The present invention solves the problems of the state of the art since:

- It provides a system of connection between the wood and the concrete that acts as a mixed structure of resistance and rigidity superior to those obtained with other types of connectors (Figure 5).
- **It avoids overall breakage due to local crushing** of concrete around the washer body and avoids breakage due to tearing of the wood.

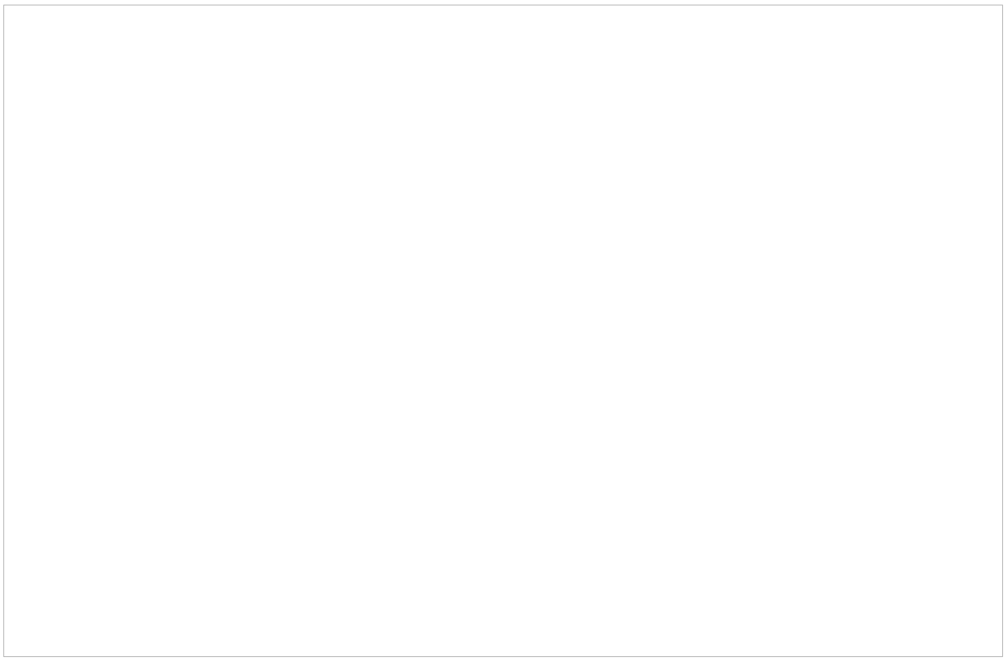


***Figure 5.*** *Overlay of load-slip graphs obtained with the designed connection (Cone3) and those obtained from the push-out tests performed by Eric Steinberg, Ricky Selle, and Thorsten Faust ("Connectors for Timber-Lightweight Concrete Composite Structures". 2003 Journal of Structural Engineering).*

Another advantage is the compressive stress between the two materials, due to the inclined arrangement of the lag bolts, which increases friction between them and favours the good behaviour of the whole.

In addition, as no special tools are required for installation, it is **very easy to install the connection system.**

### INNOVATIVE ASPECTS

The main innovative aspect of this invention is that the diameter of the washer body, being much larger than the rest, transmits stresses to a sufficiently large area, thus avoiding the crushing of the concrete, and therefore a premature exhaustion.

## APLICACIONS DE L'OFERTA

The present invention falls within the general field of **metal fasteners for wood** and, in particular, refers to a system for connecting mixed concrete and wood structures and their use for the **rehabilitation of structures** involving wooden beams that support a concrete slab, or **for new buildings** of the same materials, either with sawn or laminated wood, in the latter case achieving the mastery of large spans.

## COL·LABORACIÓ BUSCADA

We are looking for companies that manufacture screws and wood structure construction sector interested in acquiring this technology for commercial exploitation through:

- Patent licensing agreements to assign the rights of use, manufacture or marketing of the technology to third parties.
- R&D (technical cooperation) project agreements for the use of technology.
- Subcontracting agreements for technical assistance, training, etc.