

NAILS WITH AN INNOVATIVE SHAPE FOR HIGH RESISTIVE (RESISTANT) NAILING IN EXTREME CONDITIONS

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Abstract. The paper concerns a new type Nail. The body of the Nail has a form of an equilateral triangle with bulging arched sides (Reloe triangle). The head of the Nail has three bulging parts of spheres (lower sides). The upper side of the head is flat with a groove in the center, formed as a Reloe triangle. The lower side of the Nail's body has a gad, formed as a triangle bulging spheroidal pyramid. The sides of the pyramid are parts of spheres (Reloe tetrahedron). When the forging is oriented, the removing is more difficult. The Nail is applicable in building, in furniture and in everyday life.

The Nail is different from the ordinary nail because the cross-section is a Reloe triangle. The surrounding surface of the cylindrical part of the Nail is 5.56% bigger than the one of ordinary Nail. Therefore, the friction force, which acts when removing the Nail, is higher (twice greater resistance against removing of the nails and against rotation of connected elements) than the corresponding ordinary nail. The used in experiments wood elements are made from dry coniferous wood.

The Nail has three spherical surfaces and three edges. This creates the possibility of oriented nailing against the transverse force.

The oriented forging and difficult removal of the Nail have the following advantages:

Provide greater resistance to collapse of the structure. As a result that gives a greater security of wooden buildings, especially in areas with high risk of earthquakes, tornadoes and other disasters.

The possibility of oriented forging provides greater resistance to the transverse force actions against the nail body.

The results of experiments for high resistive nailing are presented. The experiments were conducted in the laboratory "Smart lab" with using of 3D printer, thermo camera FLIR.

Keywords: nail, Relo triangle, wooden structures