



University of Zabol
Graduate school
Faculty of Natural resources
Wood and Paper Science and Technology Department

**The Thesis Submitted for the Degree of M.Sc
(wood Composite products)**

**Evaluation of the performance of special pozzolanic
portland cement (PPV) and type 1 portland cement on the
strength and durability of cement wood made from wood
chips of pistachio tree branches**

Supervisors:
Dr. M. Shamsian

Advisors:
Dr. M. Arabi

By:
M. Khanamani

October 2023

Abstract:

The main purpose of producing wood-cement panels or composite products with inorganic bonding is to combine organic particles such as wood and lignocellulosic materials with inorganic binders such as cement, plaster, etc. In this research, in order to investigate the functional properties of wood-cement compact plates, variable factors including portland pozzolanic cement and pistachio branch wood chips were combined with each other in ratios of 50, 50, 40, 60, and 30, 70, respectively, and in order to reduce the effect of extractive materials. Wood chips were used at two levels of 3% and 5% compared to the dry mass of cement, calcium chloride additive was used as a reinforcement, with this combination with three repetitions of 18 test samples and to compare the effect of pozzolanic portland cement with type 1-425 portland cement. A control test of type 1 portland cement and pistachio wood chips in a ratio of 40, 60, respectively, on one surface with 5% calcium chloride, dry mass ratio of cement with 3 repetitions, which made a total of 21 wood-cement board samples. Mechanical and physical tests such as bending strength (MOR) and modulus of elasticity (MOE) based on EN310 standard and physical tests of water absorption (WA) and thickness stretching (TS) for 2 and 24 hours based on EN317 standard were performed on them. The obtained results were analyzed with SPSS software, and in this study, boards made with 70% Portland pozzolanic cement and 5% calcium chloride had the highest physical and mechanical resistances, and the lowest resistances were related to boards made with 50 The percentage of Portland cement is pozzolanic and 3% of calcium chloride, and the increase of pozzolanic cement and calcium chloride has a significant effect on the resistances. In the comparison of special Portland pozzolanic cement with Portland cement type 1, the control sample of Portland pozzolanic cement with a proportion of 60% cement and 5% calcium chloride with the control sample of 60% type 1 cement and 5% calcium chloride of Portland pozzolanic cement has the highest bending strength and modulus of elasticity and the lowest amount It has water absorption and thickening.

Key words: composite product, special pozzolanic cement, cement wood, pistachio tree branch.