

## ABSTRACT

Palestine is witnessing a steady increase in population, which has led to a high demand in the construction sector to meet the population's needs for housing, restaurants and shops. This of course leads to increased consumption of building materials, including building stone. Natural stone rocks are the main source of stones; however, extracting and processing natural stone is difficult and expensive; for this reason, artificial stone has emerged as a potential alternative to natural stone. Unfortunately, the artificial stone industry still relies on manual labor with minimal process automation; therefore, the production rate is relatively low.

To mitigate the challenges of cost and production rate in the artificial stone industry, it is necessary to automate the production processes in this sector; in particular, automating the demolding process. Since the cost of imported automatic demolding machines is high, it would be less expensive to manufacture such a machine locally.

In this project, an automated demolding machine is designed; the machine consists of four main blocks: stone feeding, stone demolding, stone unloading, and mold spraying. All blocks and parts were designed using the SolidWorks software, and a simulation of the machine's working stages was carried out. Moreover, to prove the concept of demolding by vibration, a prototype of the vibrator (which is the demolding block) was manufactured in collaboration with the Al-Talawi Factory in Nablus. Finally, a preliminary financial analysis was conducted to compare manual demolding cost versus automatic demolding cost to prove the feasibility of automating the process.