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## Wet Clay Crusher Machine for Tile Manufacturing Industries

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### ABSTRACT

Tile manufacture is a leading developing industry in Sri Lanka. A tile is manufactured using ceramic, stone, metal, baked clay, or glass. It is commonly used to cover objects such as roofs, floors, walls or tablets and it has great demand in markets. Clay important material for making porcelain and ceramic tiles. When using clay, the clay needs to crush for a specific scale. There are several clay crushing machines available in markets such are traveling breaker plate mills, high tonnage hammer mills, pulverisers, impact dryer mill and others. The existing machines facing issues in crushing wet clay. The machines get sticky, and it reduces the machine efficiency. The machines need additional labour support to remove all the sticky clay from the machines. The wet clay crusher machine is proposed to the title manufacturing industries for increase efficiency, reduce production costs, and reduce maintenance costs. The proposed machine has two types of special shafts. Two shafts with ratchet wheels, it's placed bottom of the machine and a block shaft is placed on top of the ratchet wheel shafts. Ratchet wheels use to crush the clay. Block shaft uses to push the clay into the middle of the ratchet wheel shafts. These shafts are rotating by a three-phase motor. The motor connects to the shafts through a gearbox. There is a gearbox for reducing the motor speed and increasing torque. The mechanical design avoids the sticky problem. The rates of the clay crushing process are significantly higher more than labour-power. The final shafts rotation speed is 128 rpm. This constant speed helpful the good crushing process and, this machine's power consumption is 0.745kwh. The machining process crushes 2kg of wet clay within 5 seconds and the machine maintenance cost and power consumption are lower than labour costs for the crushing process.

**Keywords:** *Block shaft, Ratchet Wheel Shafts, Sticly Clay, Tile Manufacture, Wet Clay Crusher Machine*