

## Development of ceramic materials for the manufacture of bricks with stone cutting sludge from granite

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### OBJECTIVES:

- Reduce deposition of stone cutting sludge in landfills.
- Reuse a waste that has no use.
- Reduce the extraction of virgin materials, clay.
- Reduce CO<sub>2</sub> emissions.
- Create cheaper material.
- Benefit the ceramics industry and the waste producer.
- Being inside the Circular Economy.

### MATERIALS:

- Clay; Stone cutting sludge; Water.
- ### COMBINATION OF MATERIALS STUDIED:
- Mix clay and stone cutting sludge in different proportions.
  - Add 10% water.
  - Compact the mixture with 50 MPa in steel die.
  - Samples have dimensions of 60 x 30 millimeters.
  - Measure dimensions and weight.
  - Dry at 105 degrees Celsius for 24 hours.
  - Remeasure the dimensions and weight of the samples.

## Results:

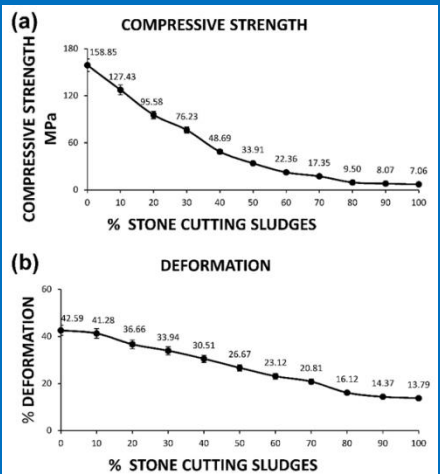
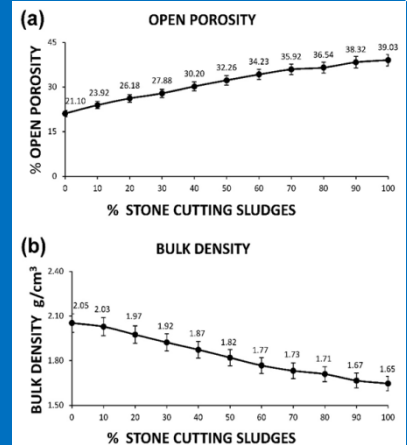
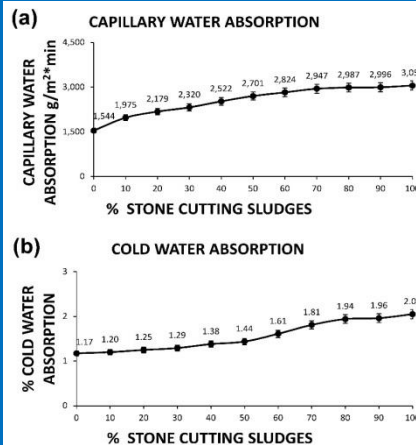
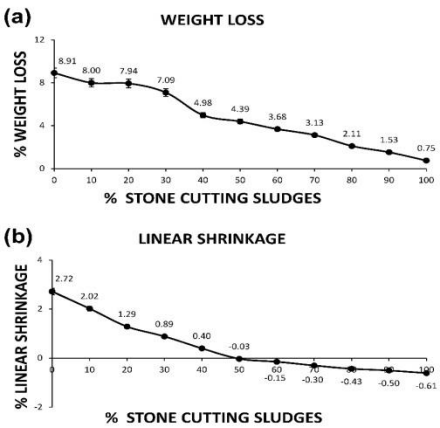


Image of a sample of each family of ceramics made from stone cutting sludge. From left to right, 0S10C, 1S0C, 2S8C, 3S7C, 4S6C, 5S5C, 6S4C, 7S3C, 8S2C, 9S2C, and 10S0C.

### CONCLUSIONS:

- Percentages of direct incorporation (without crushing, unsify) of stone cutting sludge less than 70% are acceptable by the European ceramic brick regulations.
- These high percentages mean economic and environmental savings. Other waste can only be incorporated in 5%. Example: water purification sludge.
- Lower density means greater thermal and acoustic insulation.
- The colors are similar for these percentages.

### NEW PROJECT:

- Test sintered stone cutting sludge at higher temperatures (1250°C) for tiles, stoneware, cobblestones, facades, etc.