RAWMATS - Lab Assignment 1 (Button Tests)

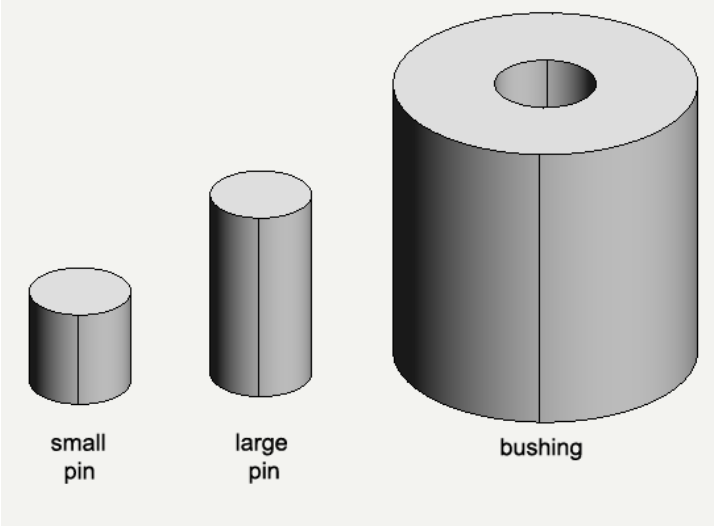
In this first lab, you will be making button tests from a variety of materials. These tests will be fired to various temperatures and in a reduction atmosphere. The results will give us a general picture of how individual materials react in a firing. This test will also give you a sense of how tightly different materials can pack in their dry state. These tests will be displayed in the Claystore for future generations so please do the best job you can.

Materials pack differently in their dry state based on the shape and size of their particles. Fine materials (especially clays) pack very tightly. Coarser materials like frit or feldspar pack more loosely. The tighter the packing, the more green strength a material will have. Some of the buttons you make will have a very hard surface. Others will be so fragile that you will have trouble handling them. Make a mental note of which materials do what as you make your tests. For some coarser (granular) materials, you will not be able to make a button. In these cases, you will sprinkle some of these materials in the button setter. You have all been assigned a range of materials that cover tight packing, loose packing, and granular materials.

A suggestion in general for testing a sequence of materials: always start with your cleanest (whitest) materials first, and end with your darkest. This ensures that darker materials don't contaminate the lighter ones.

Four components are needed to press buttons. An arbor press, a small pin, a large pin and a bushing:

Arbor Press



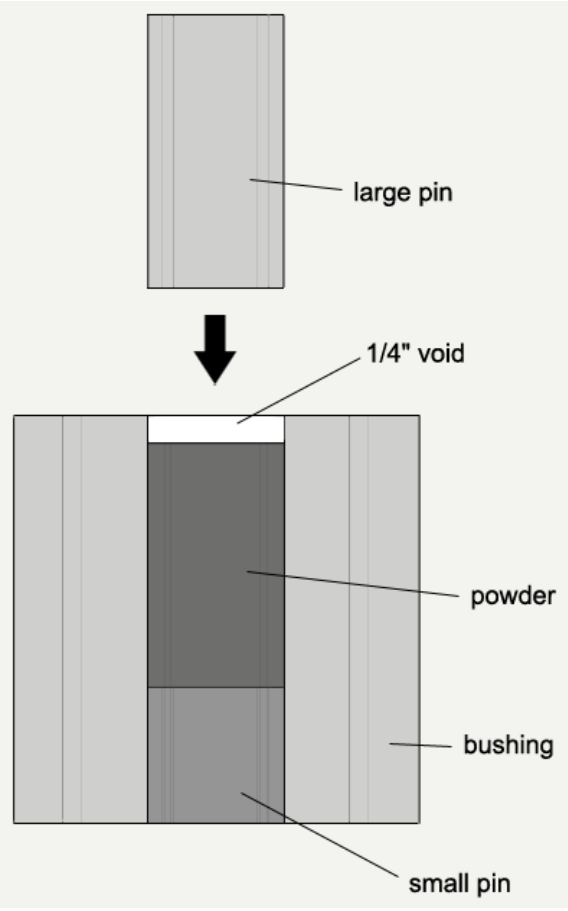
Components that make up the die

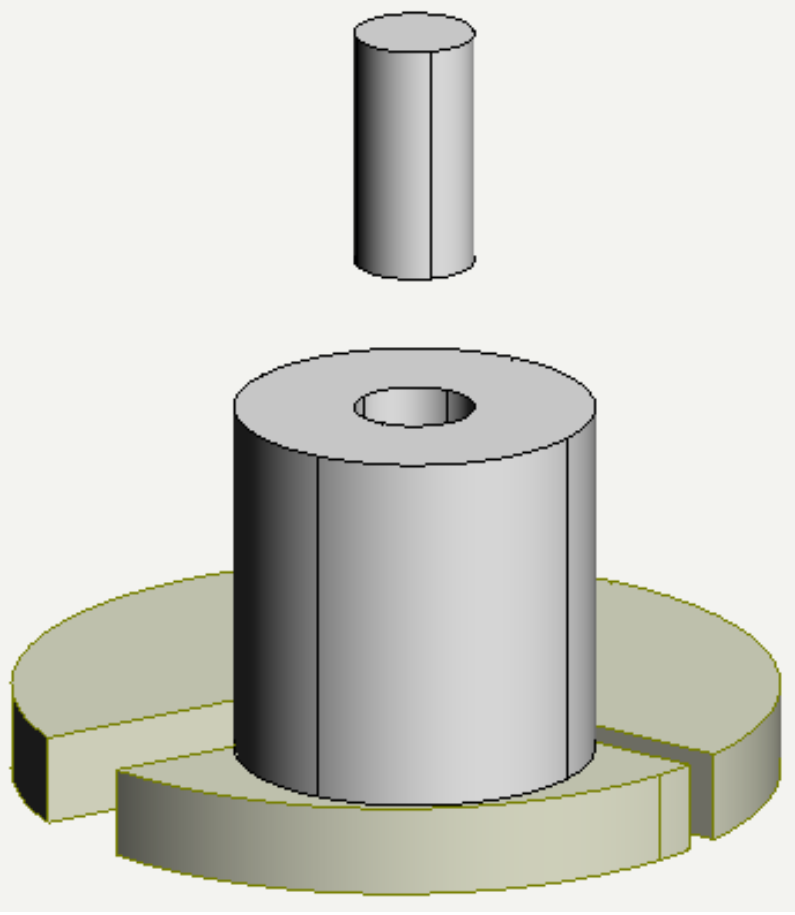
The pins slide smoothly in the bushing with almost no side-to-side play. Please don't drop the pins on the floor, as they will dent easily and will not work properly ("Big Al" Ormsby in the maintenance machine shop made these components for us. You may want to thank him the next time you meet him).

Charging the die

Start by lightly spraying the pins and bushing with some WD-40.

Next, rotate the arbor plate so that the arbor ram is in line with a solid section of the plate. Place the bushing in line with the ram. Drop the small pin into the bushing. Using a funnel, fill the bushing with your ceramic powder and leave at least a ¼ inch of room at the top of the bushing.

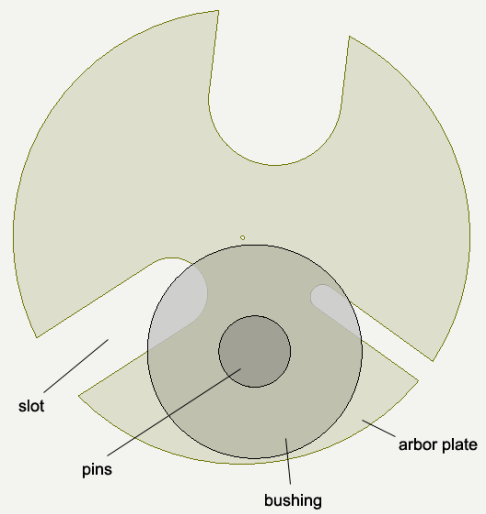




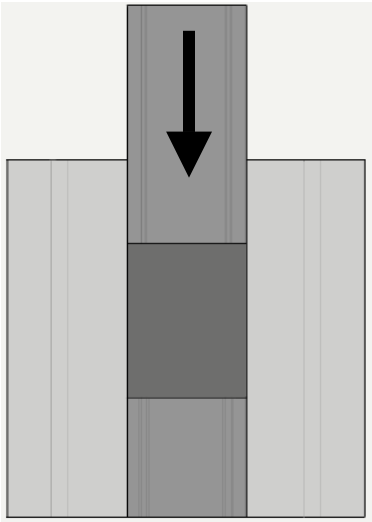
Side view of the filled die

Pressing the button

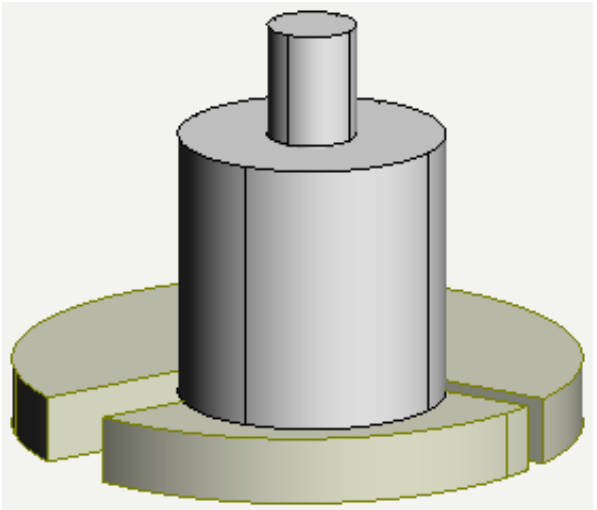
Next, place the larger pin in the opening. The ¼" space you left at the top will ensure that the pin slides in straight. If you don't leave enough room at the top, the pin may go in crooked (which will damage the pin when pressure is applied). Now rotate the arbor's side lever and apply considerable pressure. I suggest clamping the arbor press to a table so you can apply your full body weight on the lever.



Top View of Arbor Plate and Die in the pressing position. Note that the pins <u>are not</u> in-line with the plate slots.



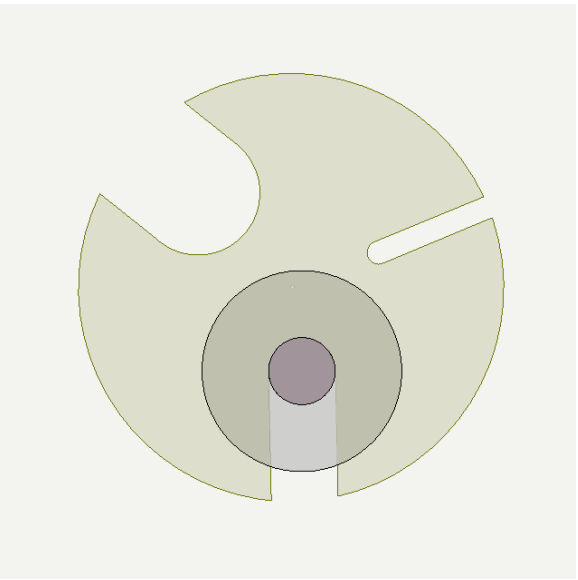
Powder is being compressed



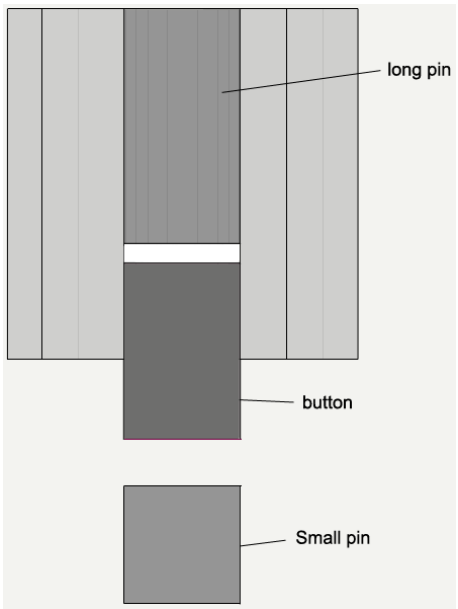
We want the buttons to be about ½" tall. Finer materials like Bentonite, and some other clays may compress beyond our goal (their fine particle size will allow them to pack more tightly than coarser materials). In these cases you may have to remove the large pin, add additional material, and re-press to add height to your button before unloading the button.

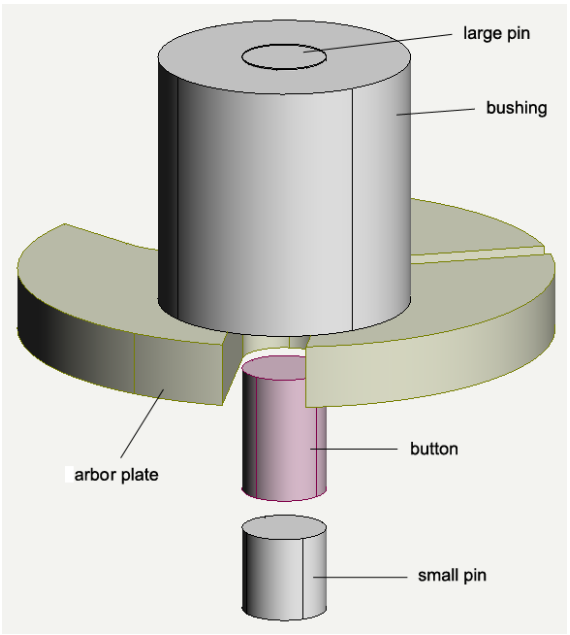
Unloading the button

When you have reached the final height needed, rotate the arbor plate so that the bushing is above one of the plate's slots (choose a slot that is large enough to allow the pin to slide through). Again using the arbor ram, re-apply pressure on the large pin. The small pin will fall out (catch it!). Keep applying pressure and the button will fall out.



Top View of Arbor Plate and Die in the unloading position. Note that the pins are in-line with a slot in the plate.





A button is born!

Remove the large pin. Clean both pins and bushing with a light coat of WD-40 and a paper towel. It is important to clean in between each sample because any material left behind will act as an abrasive, wearing down the parts and eventually rendering them useless. Repeat for all your samples. As each sample is made, it should be place on a button setter (made during class). Using a brush, CLEARLY label the bottom of each setter with the material's name using a mixture of Spanish iron oxide and water. Also indicate the temperature for the sample and make sure it is placed on the appropriate cart.

When you are done with all your tests, return the pins to the locker in a CLEAN state.

Each student has been assigned 8-9 materials. We will be firing everything at cone 04, 6, 10 and 10 reduction. So… 8-9 x 4 = 32 – 36 button tests total.

The tests must be loaded on the carts by 5 p.m. Monday January 24.