Standard Operating Procedure
FRITSCH Pulverisette 7
Ball Mill

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PULVERISETTE 7 Premium Line SOP

1. Preparation and Sample Loading

1) The volume of grinding bowl is 20 ml. The material you can grind should be never less than 1 ml, and no more than 9 ml.

Grinding bowl	Min. sample quantity	Max. sample quantity
20 ml	1 ml	9 ml

2) Choose size of the grinding balls. Our balls are made in Zirconium Oxide.

Type of feed material	Suitable ball diameter
Hard samples with a maximum feed size of 5 mm	15 mm / 20 mm
Average feed size of 0.5 – 1 mm	15 mm / 10 mm
Fine material 0.1 – 0.5 mm	10 mm / 5 mm
Very fine material < 0.1 mm	3 mm and smaller
Homogenisation of dry or liquid samples	10 mm / 5 mm

Note: It is not allowed to mix balls of different diameters, which will increase wear to the balls and bowl.

3) Put the correct number of balls. The Number of balls per grinding bowl is independent of the material quantity, please make sure you follow the table below to put the exactly same number of balls.

For 20 ml grinding ball and zirconium oxide balls

Ball Diameter (mm)	20	15	10	5	3 mm and smaller
Number of Balls	-	-	10	80	30 grams

Note: if you use 3 mm balls, you need put 30 grams in the bowl.

4) Make sure you have **the same amount** of balls in each bowl.

5) Put your materials in each bowl. Again, please make sure each bowl has the same weight. You can use the scale to weigh.
6) Put the **flat seal ring** in the bowl.
7) Screw up the **pressure release screw (press-on sleeve)**, it should be not tight so that the gas can escape in following step.
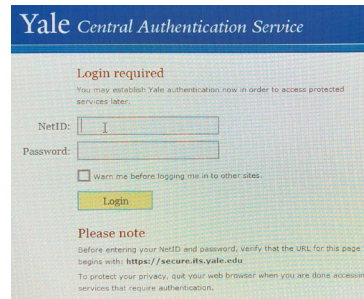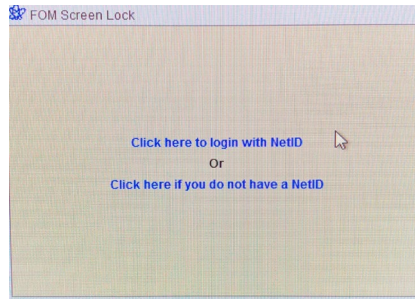

8) Put the **lid** on the bowl.
9) Rotate the lid and make sure that the locking hooks can engage exactly in the middle of the recess.
10) Tight the bowl handle to lock the cap.
   Please double check the cap was locked.

11) Turn the **press-on sleeve** down firmly.
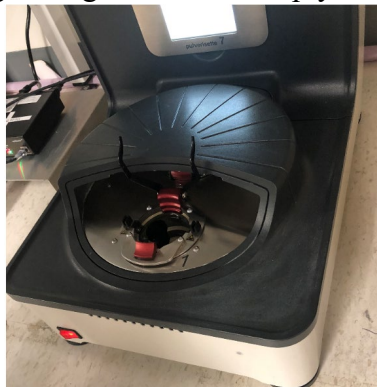
2. FOM Sign-In

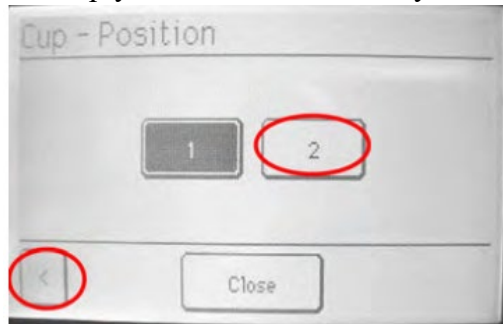1) All users are required to log in your **FOM** to turn on the ball mill.

2) Turn on **Main Switch** if the display screen is not on.

3. System Check

1) The grinding chamber cover opens when ball mill is turned on.
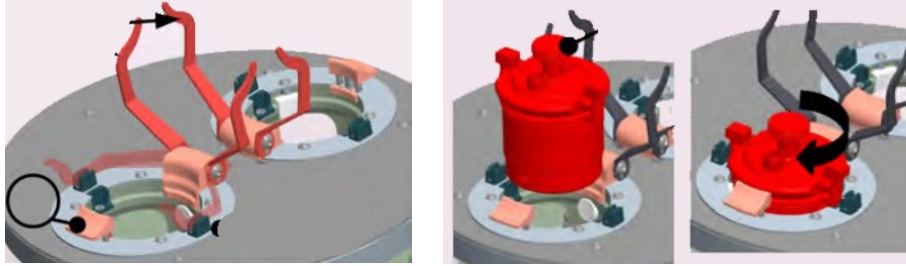2) Check if the grinding station 1 is empty. Clean it if there is any dirt.

3) Press Button '2' on the display. Grinding station 2 is moved into the loading position. Check if station 2 is empty. Clean it if there is any dirt.

4) Press the '<' button to return to the main menu.

4. Load Two Bowls

1) Make sure the bowls are clean on the outside.
2) Open the **clamping bracket** of position 1.
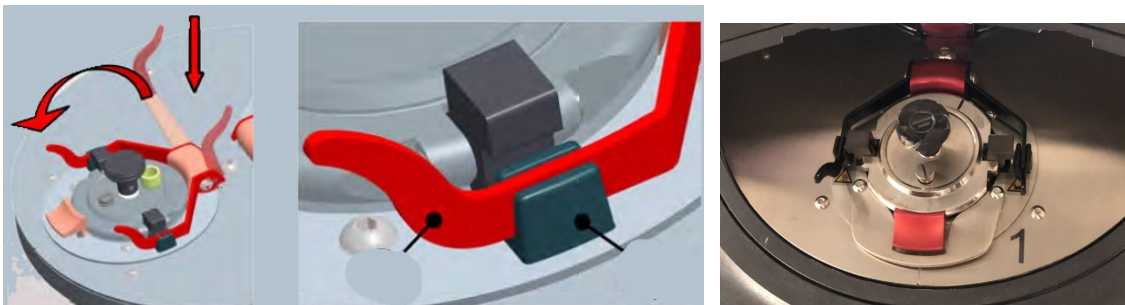3) Hold the bowl and set it in the grinding bowl adapter.

4) Turn the grinding bowl until it can be felt to engage and drops a few millimetres into the grinding bowl adapter.

5) Push the locking element down on the bowl holder. The bowl is lowered within the mounting device.

6) Press the bowl handle to lock the grinding bowl in place in its adapter. The grinding bowl is locked correctly if the locking element on the mounting device moves back up into its initial position.

7) Push the clamping brackets down until they engage in the bracket guides provided and cannot be moved down any further.
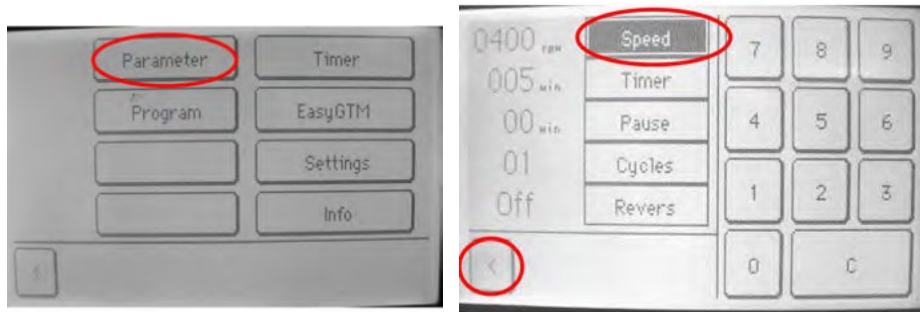
Note: If the locking element and the locking brackets are not in their original correct positions, the mill cannot work.
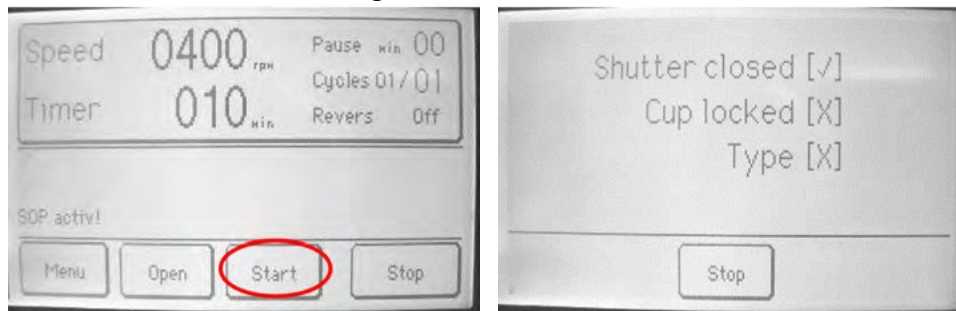

8) Load the second bowl to position 2.

5. Program Set Up

1) Press the **Menu** button.

2) Select the **Parameters** menu item. A sub-menu appears in which you can enter the speed, for example you can set it to 100.

3) Set the **time** for your milling. If you need to mill more than 10 min, please consider more cycles with pause. Never run long-time milling without a pause.
4) Set **Pause** time. Pause time must be 5 min or above.
5) Set **Cycles** according to your real milling time.
6) Press the '**<**' button to save your entry and return to the main menu.
7) Press the **Start** button to close the grinding chamber cover and start the safety check. Various sensors check the bowls and the closing mechanism.

8) Please stay here and watch your first milling. Open the cover to check the bowls are still good. Come back at least one hour to check the mill.

6. Unload the Bowls

1) Open the clamping bracket.
2) Push the locking element down on the bowl holder. The grinding bowl is unlocked and moves up a few millimetres.

3) Lift the bowl handle to take it out.
4) When the grinding bowl is removed, the locking element moves back into its initial position.
5) Push the clamping brackets down until they engage in the bracket guides.

7. Open the Bowl after Grinding

1) Allow the bowl to cool down.
2) Release the pressure by turning the press-on sleeve to open it.
3) Turn the handle to open it.

8. Bowl Cleaning

1) The bowls and balls must be cleaned after your use. Try some acids if they are very hard to clean. Please consult experts to avoid any damage.
2) Put the bowls, caps and balls in oven to dry them, Or flip the bowl to naturally dry it.
     Note: Never put the flat seal ring in oven.
3) Put all parts on the table for next users.

9. FOM Sign-Off

1) Log out FOM.

Please contact Lei Wang at 203-745-8460 for emergencies.

Safety is first.

Do not add any chemicals before you know exactly what happens.