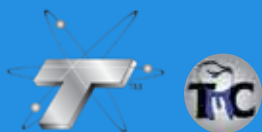
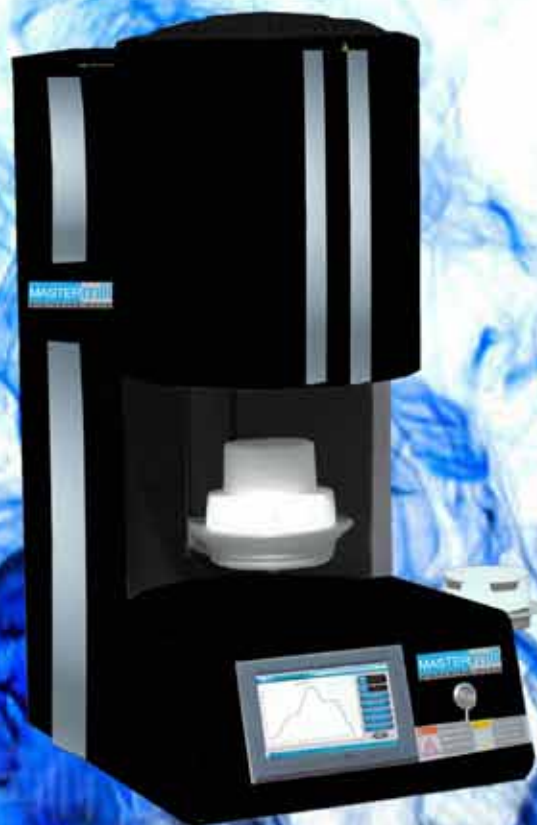


MANUAL

MASTERmill
SINTERING OVEN



Talladium, Inc. 800.221.6449
www.talladium.com



*Talladium Proudly introduces the newest product in
the MASTERmill CAD/CAM line.*

The MASTERMill Sintering Furnace is a dependable heating unit for a uniform result. This unit will heat up to 1700°C with a consistent temperature. The uniformity is due to the all round furnace chamber heating design.

The LCD Touch Screen has an interactive controller and is fully programmable. The furnace includes lift table and Molybdenum heating elements. The MASTERmill Furnace includes a one year warranty. Warranty does not cover consumable parts.

Product Specifications

- Display LCD
- Max Working Temp 1700°C
- Standard Working Temp. Less 1600°C
- Heating rate 0-20°C/min.(suggestion Less 10°C/min.)
- Temperature accuracy $\pm 1^\circ\text{C}$
- Heating Element Mosi2
- Thermocouple B Type
- Chamber Size 120 x 120mm
- Max Power 1.8kw
- Working Voltage
- 40 amp/220V single phase .50/60HZ
- Temperature Control PID automatic control via SCR
- Communication Interface USB
- Outside Size 16 x 23 x 34 inches
- 5 Pre programed settings
- Able to customize and add 15 extra programs to suite your needs

Installation, Start up & Stop

- Furnace should be kept indoors with dry ventilation, dust free and from the wall at a distance so no less than 10 inches.
- Do not place flammable or explosive objects next to furnace.
- Do not place any items around the lifting base.
- Connect external air switch, make sure to connect the ground wire. Make sure machine is on the off mode.

Start up



- 1) Connect the ceramic clamps to the heating element.
Insert Ceramic plug into heating element.



- 2) Install heating elements into the top of the furnace as shown.



- 3) Attach the aluminum ribbons as shown. Make sure to secure tightly.



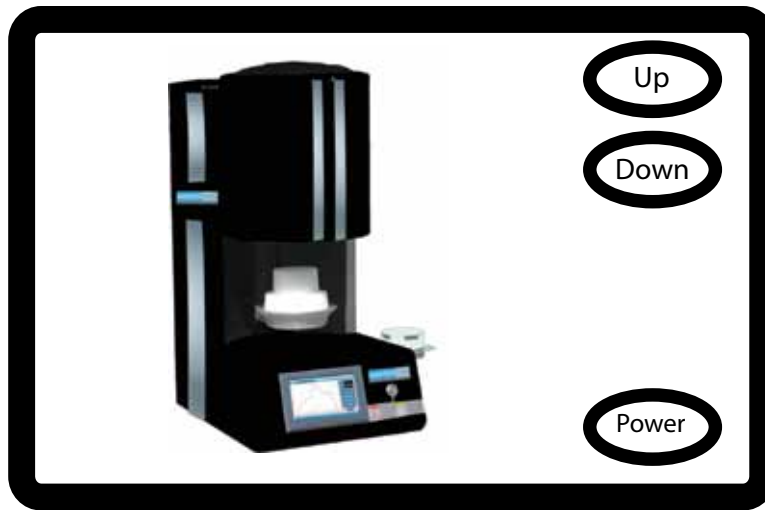
4) When connecting the aluminum ribbons keep 5mm or more of space between the ribbons and the ceramic clamps, as shown in picture.



4.1) To go with Install #4, this shows *incorrect* install of aluminum ribbon.

5) Remove thermocouple from packaging. Attach the positive wire to the positive post, and negative wire to the negative post. Insert into back of machine and secure with screw





- Close the air switch (backside of furnace)
- Press the panel power supply switch
- Press the “Down” button to make the lifting platform drop to its lowest position, then put the coil base on the platform. Clean the lifting platform and coil base.
- Put the roasting base on the coil base
- Press the “up” button to make the platform close
- To enter the page of monitoring: press the “Monitor button” then “sintering curve” button to set the current curve or preset curve. Users can choose settings.
- Press “START HEATING” then a pop up menu asks to confirm.
- Press “CONFIRM” to heat.

IMPORTANT: For the first time or after a period of non-use. the furnace should be baked at 120°C for about 1 hr. and then baked for 2 hrs at 300°C to avoid damage to the heating elements and furnace lining. Furnace temperature should not exceed the rated temperature.

Stop

- The furnace automatically goes into stop mode after sintering is complete. When the chamber temperature goes lower than 200°C, then you can switch off the air switch on the back of the furnace.
- If the furnace doesn't work, the lifting platform should be lifted to the top to ensure the furnace chamber is dry

Safety Precautions

- User refitting the equipment in privately is prohibited.
- It is forbidden to put poisonous and harmful chemicals and high pollution items in the furnace chamber, which may cause injury to body.
- During continuous heating condition, the surface temperature of the furnace may heat above 70°C. Please do not touch the furnace directly, as it may do harm.
- Please cut off power supply when cleaning furnace. Do not use any cleaner or flammable liquid to clean furnace. Use water only with wet cloth.
- Please do not use sharp objects to press on the control unit display screen such as a pen.
- If operating or cleaning furnace incorrectly will not be covered by warranty.
- Do not remove cover of the exhaust fan when using.

Heating Element Replacement

If heating element is damaged, please follow the steps below to replace element.

1. Screw top off
2. Screw off the element's clamp head screw
3. Take off the aluminum braid
4. Take off the fixed porcelain clamp screw
5. Take off the alumina
6. Remove the damaged element
7. Place the new rods and alumina spacer blocks into the slot position at the same time.
8. When screwing back the porcelain, you should pull up the rods to 5mm to prevent touching the bottom of the furnace. This will prevent thermal deformation.

Common Trouble Shooting

Problem: You switch on power, input temperature control curve, pressed “start heating” and 10 minutes later the monitor interface shows that the system is heating and the temperature is increasing but the chamber temperature is maintaining original temperature and not increasing.

Reason: Faulty heating element.

Fix: Keep equipment heating, unscrew the top. Using a multimeter AC voltage gear, measure the element voltage. If the pressure differential is small then the element is regular. Keep the black meter attached but move the red pen to the next element to measure. If the pressure increase to high then it means that element is damaged and needs replacing.

Problem: A pop up interface appears with a dialog box that says “over temperature alarm! Temperature component fault!”

Reason: Temperature sensor is damaged or sensor is probably not firmly attached.

Fix: Open backside cover. Check if sensor is firmly attached. If the sensor is firmly attached and still not working then screw off the fixed screw and pull out sensor. Use a multimeter ohms gear to check the sensor. If the resistance is infinitely greater then the sensor is damaged and replace sensor.

Problem: A pop up interface appears with a dialog box that says “over temperature alarm! only.

Reason: Furnace temperature is too high over the system default threshold temperature.

Fix: Enter system parameter, check if parameter temperature is too low. Then SCR is damaged and needs to be replaced.

Maintenance

1. Never open the chamber door when high temperature processing is occurring.
2. During sintering process , never interrupt the power supply, unless confirmed temperature is lower than 300°C. This will cause the cooling fan to stop working thus the product onolgy will get damaged.
3. Remember before first time usage, the furnace should bake 120°C for one hour, then 300°C for two hours to avoid damaging the furnace chamber.
4. The MoSi₂ heating rods are very brittle in regular temperature so once heating element is installed, do not open or move the furnace.
5. The MoSi₂ rods should not be used in temperature of 400-800°C for long periods of time or rods will oxidize. This is called aging and heating rods need replacement.
6. Regular inspect control system's electrical connection parts are connected firmly.
7. In the sintering process and the temperature is 200°C - 300°C and the control deviation can not be eliminated and parameter temperature is different or too large, please check the P.I.D parameter setting.
8. Sensor which adopt B type high temperature double platinum rhodium (30%-60%), the instrument accuracy is between 0 to 600°C is 0.5, between 600 to 1800°C is 0.2. The adopt S single platinum rhodium sensor accuracy is 0.2.
9. This furnace is suitable in operating conditions such as; environmental temperature is -10 -75°C, humidity is lower than 85%, no conductive dust or explosive gas and storing nof obvious inclination,vibration and turbulence.
10. User in compliance with these provisions of storing, installation use, transport conditions from the date delivered to 12 months, Talladium will offer free service for the user. After the warranty expires, Talladium can continue a paid maintenance fee. (heating elements are a consumable item and is uncovered by warranty.

Preset MASTERmill Sintering Oven Firing Programs

<i>Program 1 (Bridge)</i>	<i>Program 2 (singles)</i>	<i>Program 3 (fast fires)</i>
0	0	0
30	60	30
300	1200	1200
60	60	60
1000	1520	1520
120	60	60
1520	1520	1520
120	60	60
1520	600	600
60	-121(MINUS)	-121(MINUS)
800		
-121(MINUS)		
<i>Program 4 (Long Bridges)</i>	<i>Program 9 (Revitalize/ Cleaning)</i>	
0	0	
60	6	
300	400	
120	12	
1000	760	
120	7	
1520	760	
120	-121(MINUS)	
1520		
120		
800		
-121(MINUS)		

Programming the Oven

1. Turn on the oven by pressing the power button
2. Press the Monitor icon
3. Press Sintering curve icon
4. Press the Enter icon
5. Select the program number you want to program (Ex. if you want to program, Program #1 then press 1, then enter)
6. Now you are ready to customize the sintering oven.