DUOTRONPRO

- Zirconia Sintering Furnace S-6100

Operating Instructions

Make sure you carefully read this product manual before using product

Product Warranty is included at the back of this manual

Index

1. Introduction

Thank you for purchasing S-6100 Furnace. S-6100 Furnace is subject to stringent quality control procedures and patiently follow standard procedure. As results of our quality system, S-6100 Furnace has better performance.

Also, S-6100 Furnace has sturdily and gracefully designed and programmed as user friendly.

This Operators Manual will explain the installation and operation of the oven as well as help you get the most out of your new S-6100 Furnace. Please read carefully the instructions in this manual for the best user experience.

⊙ Attention

Please ensure that all safety information has been read by the operator before using the oven.

- The Safety information is divided into two sections: Warning and Caution as described below:

Warning

Violations of instructions may cause increased risk of serious injury or death.

Caution

Violations of instructions may cause increased chance of material waste or injuries.

Warning

1. Do not disassemble, repair or modify any part of the machine without prior approval from an authorized technician. It could be out of warrantee and could cause damage, electric shock or fire.

2. Ensure the oven is properly grounded to prohibit error or electrical hazard.

3. Do not cut or modify the power cord. Do not stretch or bend the power cord that may cause electrical hazard.

4. Keep flammable materials away from the oven at all time.

5. Keep liquid away from the oven and avoid using the oven in damp environment to prevent electrical hazard.

6. Ensure that the power plug is firmly plugged into the proper section. Unstable contact may cause a electric spark and a fire.

7. Always wear heavy thermal insulated gloves when handling units with door open to avoid burns.

8. Always ensure that the oven is completely stopped before working with the oven and only operate the door when the machine is not in a cycle.

9. Do not touch or handing the power plug. It may cause an electric shock or a fire.

10. Carefully use tongs without touching wires when takeout Casting Ring from inside of Furnace.

11. Do not place flammable materials or body inside of Furnace. It may cause a burn or a fire.

Caution

1 Keep away from Furnace during operation. While running, furnace generates high temperature.

2. Please handle the oven carefully to avoid damage. The furnace contain fragile parts.

3. Do not use in places with a lot of vibration.

4. Please read the manual and understand the instructions before using the oven.

5. Do not leave Furnace with a door open.

6. Keep away from flammable spray or materials from Furnace.

7. Do not install Furnace on place with gradient or rocking table

8. Do not pull a plug out with a strong force.

9. Keep temperature lower than 40 Celsius degree and sweep the dust out.

10. If detecting any defect during the operation, stop using and inquire manufacturer.

11. Use dry cloth and unplug power cords when cleaning Furnace. Do not use any detergent.

12. While operating and right after, do not touch Furnace. Especially, do not touch the upper part of furnace. It may cause a burn or a fire.

13. Keep away flammable materials from Furnace. It may cause a fire.

14. If Furnace is not in use, turn off switch to power off.

15. If Furnace is not in use for long term, pull out power plug.

16. Changing insulation: Contact particulate from insulator with the eyes or skin may cause irritation. Long term and inhaling a large quantity of the particulate from insulator may cause respiratory disorders. Try protect skin, eyes and respiratory organs with wearing safety glasses and mask.
<Compliance matters: wear long sleeves clothes, safety glasses, mask and using vacuum machine. After work, wash unprotected skin with fresh water.>

17. Cracks in insulator should occur by a high temperature or a rapidly changing temperature. However, cracks by thermal shock in insulator does not critically affect Firing result. (In case of cracks on Tray insulator may affect on temperature. In that case, need to change tray insulator through manufacturer or local distributor.)

18. Do not start firing schedule without tray insulator. Starting schedule without tray insulator may cause fire or damaging in furnace.

19. Risk of explosion if battery is replaced by an incorrect type.

Dispose of used batteries according to the instructions.

Symbol Description

Symbol	Description
	This product fulfills the requirements of Directive 2014/35/EU on Low Voltage directive
	Alternating current
	Caution, hot surface
	Caution, See Instructions for use
	On (Power)
	Off (Power)
	PROTECTIVE CONDUCTOR TERMINAL
	Electrical waste and electronics equipment

2. Product Information

(1) **Characteristics**

►Easy to operate and full set of features

►Easy-to use display provides all available information and setting control.

►10 custom temperature settings

►Maximum ramp up rate 25℃/min (15 ℃/min over 900 ℃)

►Compact size

►Double stock Trays in sintering chamber

(2) **Main Functions**

►User defined programs

►Progress indicates with LED lights

►Display remaining time.

►User can fine-tune temperature.

3. **Technical Data**

Temperature Sensor

Sensor Type	Thermocouple R-type
Sensor Range	0~1760℃

Main Controller

Voltage	DC 12V
Display	LED Display

I/O Controller

Voltage	DC 12V
Output	1 Ch. : DC Fan

General

Voltage	AC 230V, 50/60 Hz
Fuse	30A / AC250V
Max. Current	10A
Dimensions	324 ㎜(W) x 391 ㎜(D) x 527 ㎜(H)
Chamber	110 ㎜ x 110 ㎜ x 100 ㎜ (h)
Max. temp.	1600℃ (For holding time longer than 30 min, 1580℃)
Max. ramp rate	25℃/min (15℃/min over 900 ℃)

Temp. range	+2℃ ~ +35℃
Working humidity	Less than 80%
Working altitude	Lower than 3800m
Weigh	35kg

4. Install

(1) Connect AC Power

This product require AC 230V. Before connect power, ensure voltage.

(2) List of parts

After open a box, ensure there are every list of parts. Also, check any visual damage. If you find any damages or defects, contact seller.

< List of parts >

- Furnace housing 1pc
- Instruction 1pc
- Ceramic tray 1pc
- Ceramic cover 1pc
- Substructure for tray 1pc
- Zirconia beads (100g) 1pc
- POWER CORD 1pc

(3) Installation

Avoid sunlight or moist when installing the product. Also, install on a level place. Dust could damage on heating elements, thus, install in clean

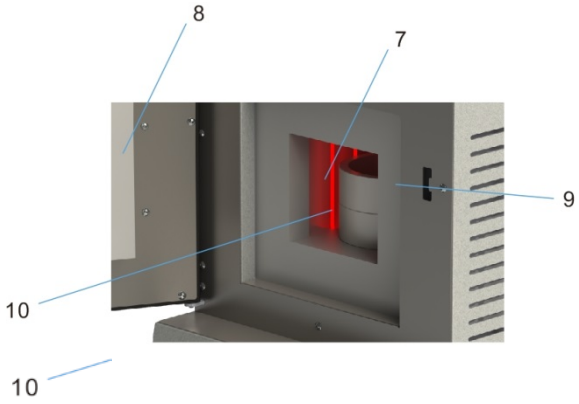
environment. Place a furnace at least 30 cm apart from the wall and 1.5 m away from the ceiling. If too close to wall or ceiling, may cause a fire and damage on product.

Do not place flammable materials on the top of product. Before use, install a ventilation system above the product to remove harmful gas during sintering.

5. Appearance and Name

List of parts

1. Furnace housing
2. Sintering Platform
3. Air Ventilation opening
4. USB port for program upgrades
5. Touch Screen Monitor
6. Control Housing
7. Sintering chamber
8. Oven Backing Plate
9. Insulation
10. Heating elements



6. Front Panel Information

Display

<Information in this picture is only examples>

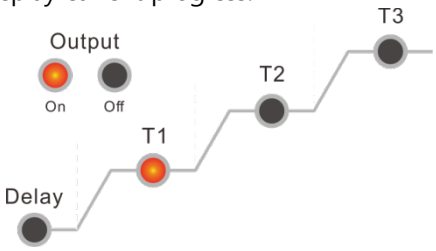
1) Time and Mode display

① Displaying the time required for selected schedule

② Changing schedule: Changing schedule with pressing PRG. button

2) Current Temperature Display.

3) Display current progress.



① Output on : Fan on, Output off : Fan off.

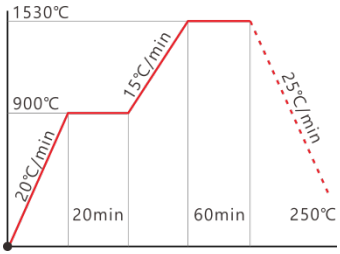
② T1, T2, T3 : Blinking light at current progress.

7.Run and Temperature Setting(3 Stages)

1. Run (Example: Schedule)

Press PRG. button → Schedule Blink → Lift Up / Lift Down: Use up/down arrow button to select schedule (1~9)

Press Ok button → Start Stop: Ready to Start (LED light blink)



2. Temperature Setting (3Stages)

Press PRG. button → Remaining time (Min. / Sec.) Schedule → T1 LED light Blink

Displaying temperature and T1 blink

Use up/down and left/right arrow to change T1 temperature

Press PRG. button → Remaining time (Min. / Sec.) Schedule → T1 LED light Blink

Displaying Ramp up rate and blink

Use up/down and left/right arrow to change ramp up rate

Press PRG. button → Remaining time (Min. / Sec.) Schedule → T1 LED light Blink

Displaying hold time at temp. T1

Use up/down and left/right arrow to change time for staying at T1

Press PRG. button → Remaining time (Min. / Sec.) Schedule → T2 LED light Blink

Displaying temperature and T2 blink

Use up/down and left/right arrow to change T2 temperature. Input 0 will skip T2 stage

Press PRG. button 

LED light Blink


Displaying Ramp up rate to T2 and blink

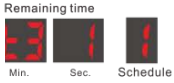
Use up/down and left/right arrow to change ramp rate. Input 0 will skip this step

Press PRG. button 

LED light Blink


Displaying hold time at temp. T2

Use up/down arrow to change time for staying at T2. Input 0 will skip this step

Press PRG. button 

LED light Blink


Displaying T3 temperature and blink

Use up/down and left/right arrow to change T3 temperature. Input 0 will skip T3

Press PRG. button 

LED light Blink


Displaying Ramp rate to T3 and blink

Use up/down and left/right arrow to change ramp rate. Input 0 will skip this step

Press PRG. button 

LED light Blink


Displaying hold time at temp. T3

Use up/down arrow to change time for staying at T3. Input 0 will skip this step


Set up ramp down rate

Use up/down arrow to change time to input hold time at T3


If it is “0”, heater off after finishing T3 progress.
Schedule will include cool down time till 250 °C with 25 °C/min. rate.


If it is “1”, schedule will progress with controlling temperature down.
Heater will turn off after cool down till 250 °C with 15°C/min. rate.


If it is “2”, staying at maximum temp. for 10 sec. with alarm.

Press PRG. button

LED light on at On sign

Output On Temp. ºC will display and blink

Use up/down and on/off arrow to input Output On temp.

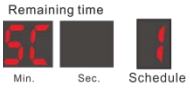
Press PRG. button

LED light on at Off sign

Output Off Temp. ºC will display and blink

Use up/down and on/off arrow to input Output Off temp.

Press PRG. button



Back to beginning

Press Ok button to finish

Stand ready with LED blink

8. User Instruction

1. Drying materials (About 30 min.)

2. Furnace Main S/W on

3. Open the door

Push handle counter clack wise to open door

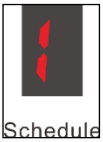
4. Place restorations on the zirconia beads in Tray.

5. Place Tray in the chamber

6. Covered tray with lid (recommand)

7. Place Tray with Lid in the center of the chamber (marked area)

8. Select sintering schedule. 9. Confirm temperature and adjust if it is necessary



.

10. Ready to sinter ->Start sintering 11. Finish sintering

12. Remove tray after finishing sintering

<Caution>

① Do not place hot tray in front of the furnace. May cause controller damage.

② Place hot tray sides of the furnace.

③ Open the door when temperature is lower than 100 ℃. May cause burn skins and fire.

9. Sintering Bridge Frameworks

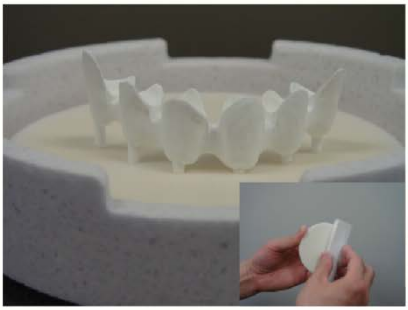
Design method 1:

Without sintering pins

Ensure that the entire surface of the substructure is supported by the sintering beads. This avoids deformation. Care should be taken to prevent sintering spheres becoming "jammed" in the connector areas. (for Sirona Cerec, MC-XL users)

Design method 2:

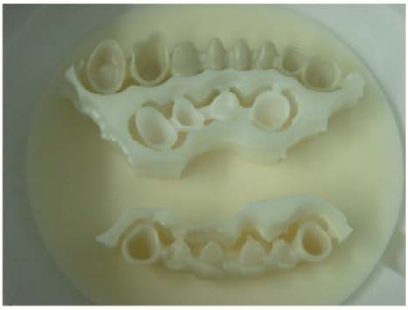
With sintering pins



This method reduces the surface friction and allows the framework to 'slide' on flat pins as it shrinks. Make sure to frequently polish the surface of the round zirconia plate by rubbing it with a grinding stone. This plate is from Katana, Noritake and works well to prevent "deformation" of your framework. (for DelCam and other open CAM software users)

Design method 3:

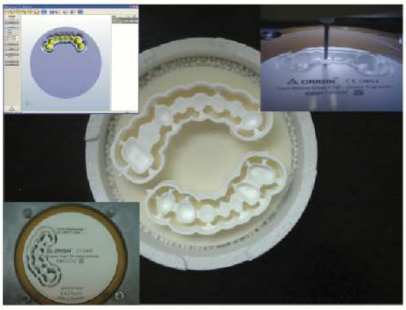
With extra support strut of zirconia



This proven method employed by experienced technicians is especially effective for large unit bridges. The "holding" effect of the extra support of zirconia prevents the warping of large unit bridges with dense pontic areas that shrink comparatively more than the abutments

Design method 4:

Profiling wall from CAM software



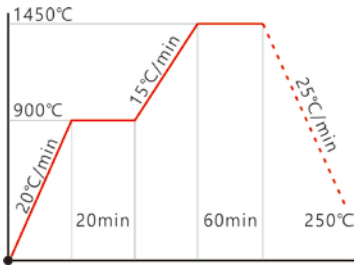
This is another proven method for medium to large unit bridges used by outsourcing centers. The surrounding wall automatically designed by CAM software provides for uniform and even shrinkage. It prevents deformation even though there are dense pontic areas that shrink substantially more than the abutment copings. (ORIGIN CAM software users)

10. Pre-set 10 Sintering Schedules

Schedule : 0

Max. temp. : 1450℃

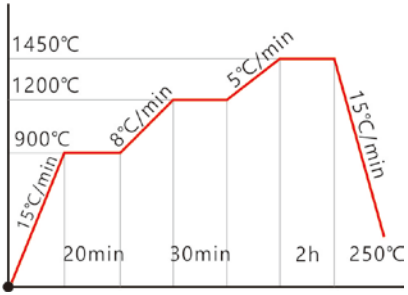
Total hours : 3hr 29min



Schedule : 1

Max. temp. : 1450℃

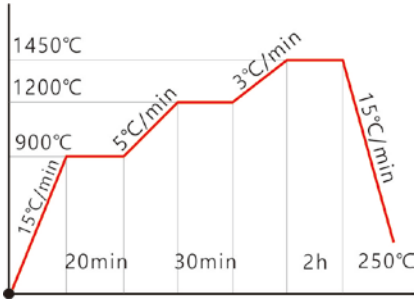
Total hours : 6hr 38min



Schedule : 2

Max. temp. : 1450℃

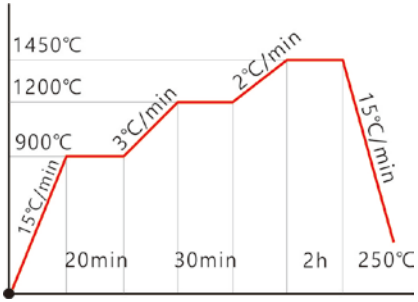
Total hours : 7hr 33min



Schedule : 3

Max. temp. : 1450℃

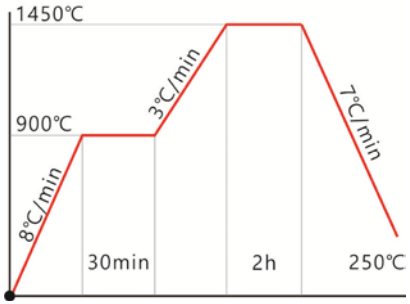
Total hours : 8hr 55min



Schedule : 4

Max. temp. : 1450℃

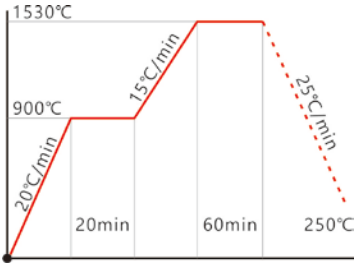
Total hours : 10hr 17min



Schedule : 5

Max. temp. : 1530℃

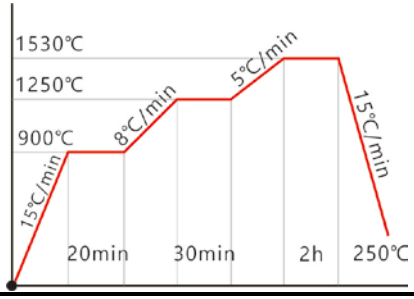
Total hours : 3hr 38min



Schedule : 6

Max. temp. : 1530℃

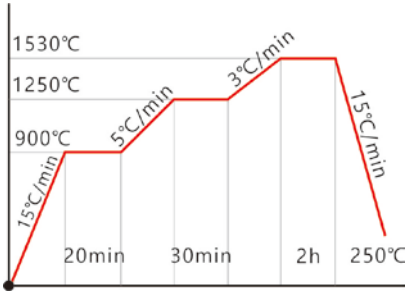
Total hours : 6hr 55min



Schedule : 7

Max. temp. : 1530℃

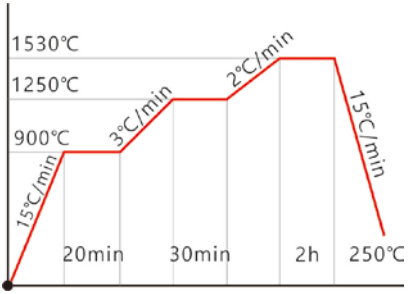
Total hours : 7hr 58min



Schedule : 8

Max. temp. : 1530℃

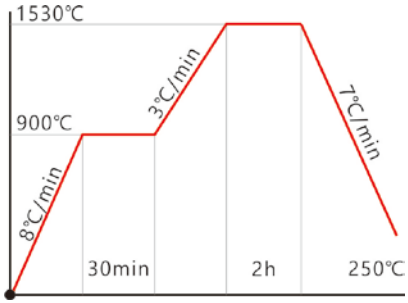
Total hours : 9hr 32min



Schedule : 9

Max. temp. : 1530℃

Total hours : 10hr 55min



11. Trouble Shooting

(1) Possible error messages and trouble shooting

Error	Error description	Trouble shooting
door	Door open or door switch error	Close the door and check the switch
Err01	Disconnected the sensor	Replace the sensor
Err02	Board or control IC is damaged	Inspection control PCB
Err03	Heating elements damaged	Replace heating elements
Err04	Short sensor	Inspection control PCB sensor part
Err05	When starting temperature is higher than T1 temperature	Restart the furnace till cool down lower than T1 temperature

12. Warranty

No.	Condition	Within warranty period	After warranty period
1	Within 10 days of purchase, require major repair by defect even though used in normal condition	Exchange or refund	
2	After 1 month of purchase, require major repair by defect even though used in normal condition	Exchange	
3	Manufacturer could not repair for a month from customer request to be fix	Exchange	Exchange + Charge for depreciation in price
4	Same problem occur 3 times	Free Repair	Repair + fee
5	Same problem occur 4 times	Exchange	Repair + fee
6	Within 6 month after repairing with charging fee, same problem occur	Repair without fee or refund repair fee	
7	5 times repaired by troubles in several parts, but detecting trouble again	Exchange	Repair + fee
8	Cannot be repaired although have the spare parts. (Within spare parts holding period)	Exchange	Exchange + Charge for depreciation in price
9	Cannot be repaired by out of parts (Within spare parts holding period)	Exchange	Exchange + Charge for depreciation in price
10	Incident due to operator error	Repair + fee	Repair + fee
11	Lost parts or products by manufacturer	Exchange	Exchange + Charge for depreciation in price
12	Damage in delivery	Exchange(Claim for damages to carrier)	
13	Lost or damaging parts during delivery from customer to manufacturer	Cost for Customer	
14	Damage during the install by manufacturer	Exchange	Free repair
15	Any other quality issue	Additional progress	

♣ It is not manufacturer's responsibility that any loss of business while product is not working.

MEMO

MEMO

MEMO

WARRANTY CARD

To protect benefit of customers and official dears, Addins inc. assure product quality as follow

Warranty is void under these circumstances

- Modification not approved by authorized support technician
- Incident due to operator error
- Sales performed by unauthorized persons
- Oven not operated as outlined in the manual
- Damage caused by external sources such as power outage, fire, act of God, etc.
- Without a warranty

Fill out this warranty card and send to e-mail (addins@korea.com) or fax to 031-848-2072.
Without submitting this warranty card, warranty may not be covered.

Customer	Name	
	Phone	
	Address	
Seller	Company	
	Phone	
	Address	
Install date		
Serial No.		Warranty period
Product Name		

Add-in 주식회사 애드인

Warranty Info

1. Warranty Length

Warranty is good for 1 year after purchase for malfunctions due to manufacturer defects

2. Warranty Exclusions

Warranty is void under these circumstances

· Modification not approved by authorized support technician
· Incident due to operator error
· Sales performed by unauthorized persons
· Oven not operated as outlined in the manual
· Damage caused by external sources such as power outage, fire, act of God, etc.
· Without a warranty

□□ □□□□□□□□□□□□□

Sales must be invoiced to be eligible for warranty

4. Caution at use

- Avoid places of sudden and/or drastic temperature changes
- Do not use flammable material for cleaning
- Do not install near high voltage usage or voltage fluctuations
- Avoid heavy shock to the machine
- Do not place oven in direct sunlight or in place with heavy dusts
- Store in dry places
- Do not use in area with vibrations

* For upgrade product, function can be changed without notice.<Updated 12. 15. 2016>

DUOTRONPRO

www.addinco.com

Add-in ㈜에드인

#321 YTC 847, Buheung-ro, Gwangjeok-myeon,

Yangju-si, Gyeonggi-do, Korea (11416)

□□□□□□□□□□ □□□□□□□□□□□□
□□□□□ □□□□□□ □□□□□□