

# Biostar<sup>®</sup> Scan/Biostar<sup>®</sup>V

## Operation Manual



**Great Lakes**

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# Biostar®

The computerized Biostar pressure molding machine features modern micro processing electronics designed to improve the ease of operation and thermal forming results.



## Installation



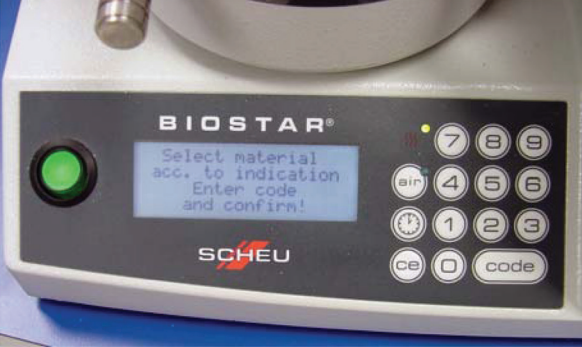
Before removing the machine and its components from the shipping box, determine the location for the Biostar in the laboratory. The machine's size and weight are outlined on page 3. Make sure sufficient workspace around the machine is available and that nothing will interfere with operation of the heating element. Reminder: *Keep any flammable material away from the heating element.*

As you unpack the contents of the shipping box, you will find the following:

- Biostar unit
- Pellet Drawer
- Pellet/model cup
- Clamping frame
- Model platform
- High pressure hose, hose clamps, and air filter
- Hose clamps
- Container of pellets
- Pellet brush

After inspecting the items, remove all packing material, and position the Biostar unit on the laboratory bench. To prevent machine malfunctions as a result of excessive dust, do not place the unit near etcher catchers, micro etchers, or any area where extensive plasterwork will occur. The air source should be within reach of the machine using the high-pressure hose as a reference guide. Do not place the pressure line under the heater along the benchtop. The air pressure should be capable of supplying a minimum of 87 psi. to the Biostar.

The following information provides a brief description of the computerized Biostar's basic components.

 <p>Heater</p> <p>Locking Handle</p> <p>Clamping Chamber</p> <p>Pressure Chamber</p> <p>Bar Code Scanner</p> <p>Pellet Drawer</p>	<p><b>Heating Element:</b> Found on left side of machine, swivels from front to back and is used to soften thermal-plastics.</p> <p><b>Pressure Chamber:</b> Compartment that the thermal-plastic material is held, heated, and formed over a dental model.</p> <p><b>Locking Handle:</b> Holds chamber in molding position and allows air pressure to enter chamber.</p> <p><b>Clamping Frame:</b> Secures thermal-plastic to chamber.</p> <p><b>Pellet Drawer:</b> Contains overflow of pellets.</p> <p><b>Bar Code Scanner:</b> Automatically enters the correct processing information for the thermal-plastic.</p>
 <p>plug with fuse</p> <p>pressure controller (regulator)</p> <p>compressed-air connection</p>	<p><b>Plug with Fuse:</b> Built-in plug with a two 8-amp fuse compartment.</p> <p><b>Pressure Controller:</b> Air pressure adjustment dial to control the amount of pressure that is used within the Biostar.</p> <p><b>Compressed-air Connection:</b> Connects to laboratory air pressure source.</p>
	<p><b>On/Off Switch:</b> Power switch.</p> <p><b>Code Button:</b> Programs heating and cooling operating times for material heating and pressure forming.</p> <p><b>Air Button:</b> Removes air pressure from chamber.</p> <p><b>CE Button:</b> Erases information placed in memory.</p> <p><b>Time Button:</b> (Illustration of clock) Allows operator to manually program heating and pressure molding times, separately.</p>



**CODE:** Three-digit code to identify heating and pressure molding times.

**(t): Heating Time:** Time that material is to be heated.

**TEMP: Actual Temperature:** Actual temperature of the heating lamp. (Ts) and (T) should be equal prior to operation.

**(P): Pressure:** Operating air pressure. Appears on screen every 10 seconds. Measurement in bar (1 bar approx. 15 psi).



**A – Platform:** Circular plate that is placed on the inner lip of the pellet cup.

**B – Pellet Cup:** Container that holds dental model, pellets, and platform for the pressure forming process.

**C – Clamping Frame:** Secures thermal-plastic to chamber.



#### Technical Data:

<b>Voltage</b>	110/220 V – 50/60 Hz
<b>Power</b>	Maximum 850 W
<b>Work Pressure</b>	Max 6 bar/87 psi
<b>W x D x H</b>	18"x 10"x 10.25"
<b>Weight</b>	35 lbs./16 kg
<b>Fuse</b>	(Two) 5x20mm 10 amp fuse



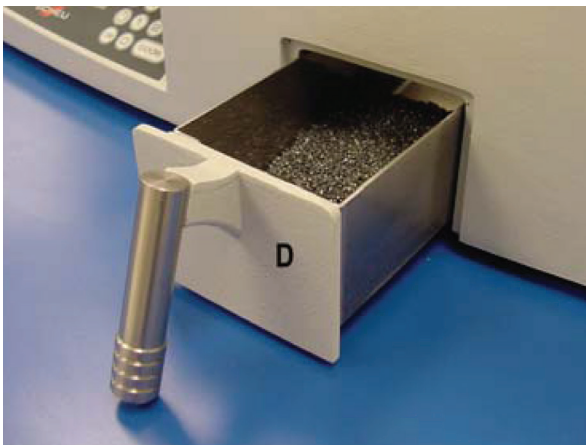


1. Plug one side of the electrical cord in the back of the Biostar and the opposite end into a three prong 110v outlet.
2. Connect the Biostar to the air source using the high-pressure hose. Secure it in place with a hose clamp.

*Note: Route the electrical cord and pressure hose away from the heating element.*



3. The pellet cup (C) is positioned on the four blocks of the Biostar table (A). Fill halfway with pellets.
4. Place platform (B) onto the inner cup lip of the pellet cup.
5. Pour pellets to half-fill the pellet drawer (D). Slide drawer into compartment located at the front of the machine.
6. Working pressure of 6 bar (90psi) is pre-set in the machine. With the machine in the "on" position, press the "CODE" button. The current unit pressure will show on the display. Reach behind the machine and pull out the regulator dial and turn clockwise to raise the pressure and counter-clockwise to lower the pressure. The display will show the change in pressure. When the desired pressure is reached, push the regulator dial back into place.

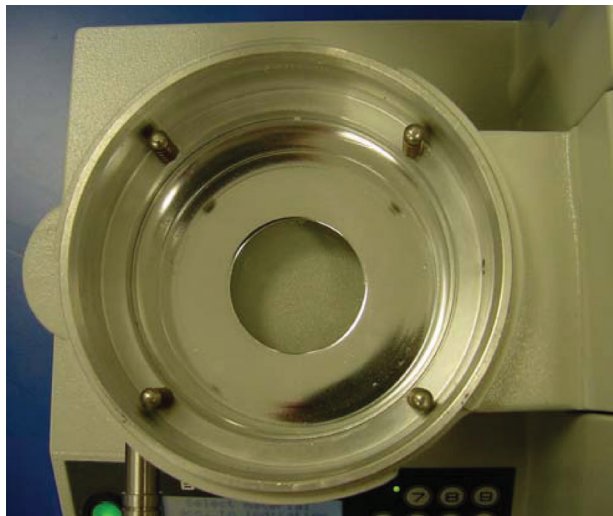


*Note: Maximum pressure can only equal what the main line is capable of supplying.*

**Reminder:** Do not use material thicker than 5.0mm within the clamping mechanism. This may cause the Biostar to malfunction while pressure is in the chamber. Always wear safety glasses when using this machine and during all fabrication procedures.

## Maintenance

A regular maintenance schedule should be followed. Proper maintenance will assure better fabrication results. Refrain from using water in the Biostar machine. Water may cause certain components to rust or corrode. When the machine is not being used, engage the clamping frame to the chamber and position the chamber on the pellet cup. This prevents lab dust from entering the pellet cup and chamber.

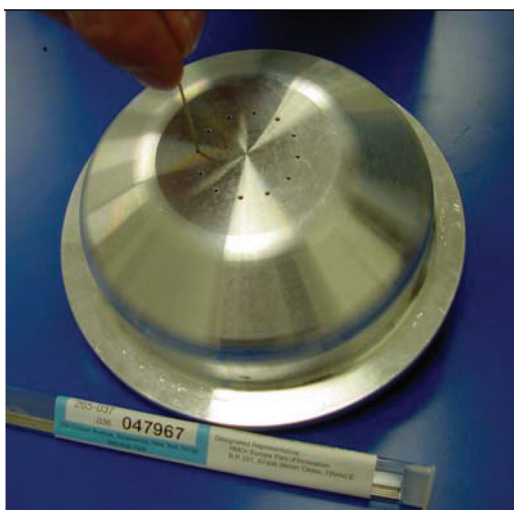


The reflective surface of the pressure chamber should be cleaned regularly with a damp cloth to achieve optimum results.



Pellets will become dirty with regular use. Clean pellets by placing them in a strainer and rinsing with hot water. Spread pellets on a towel and let air dry before placing them back in the Biostar. Check pellets monthly, discard and replace pellets in the bottom third of the cup.

Also, clean the pellet drawer space to allow for proper insertion of the drawer.

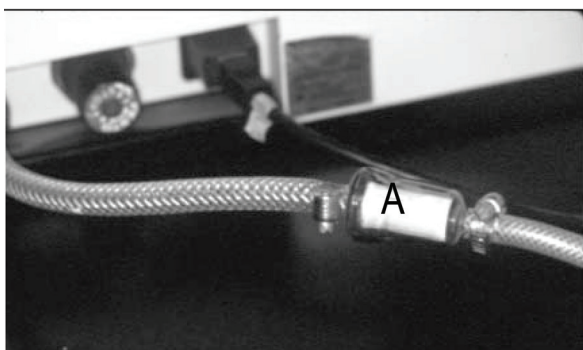


Air escape holes are present in the base of the pellet cup and should be checked monthly to ensure that they remain open. Use a .036" or thinner diameter wire to open plugged holes. Also, make sure the rim of the pellet cup and the four blocks that support the cup are clean.



Clean and lubricate top gasket every 3 months. Apply a drop of liquid dish soap onto the gasket on the pressure chamber with a fingertip. Identify potential gasket cuts or irregularities. Remove the soap from the gasket with a soft cloth.

Lubricate the side ring once each year. Remove the gasket ring from the chamber. Using a light grease (016-021), lubricate the black gasket on the side of the ring. Replace the ring with the top gasket facing up.



Check the air filter (A) for discoloration monthly.

If replacing filter, turn off the air source and bleed the high-pressure hose of air. Loosen clamps holding the filter and slide it off the hose. Position the new filter by referencing the arrow on the filter case toward the back of the Biostar.

## Operation

There are three basic functions to operate the Biostar including:

- Model preparation
- Heating cycle
- Pressure molding process

## Preparation of Models

Prepare models for the thermal forming process by removing bubbles or filling voids whether using the platform or pellets. The platform is used when forming soft or thin plastics. Pellets are used when forming thick, less flexible materials. The pellets prevent the plastic from forming to unwanted areas of the dental cast. In either case, the model should be placed with the incisors facing towards the locking handle.


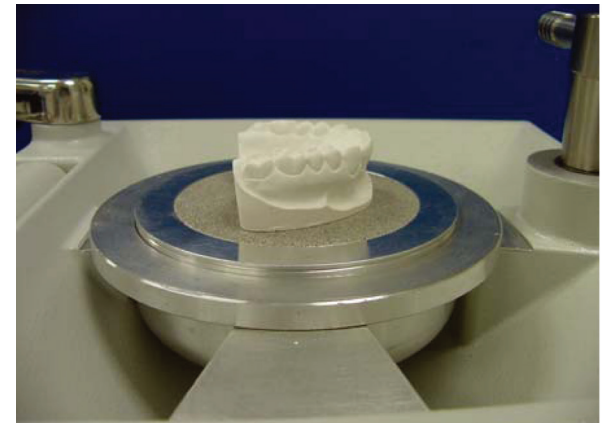
### *Use of the Platform*

The platform is used to expose the entire dental mold to the formation of the thermal-plastic. It eliminates having to use pellets. Pellets are difficult to remove from softer material (i.e. soft mouthguard material) and can create a higher occurrence of air leaks during the pressure forming process when using thinner thermal-plastics (i.e. < 1mm thick).



Place the pellet cup flush onto the four metal blocks on the Biostar table. Empty cup or reduce the pellet line to the half-way level. Make sure the inner lip of the cup is clean. Place the outer ring of the platform on the inner lip of the pellet cup with the flat platform surface on top.



	<p>Remove model bubbles and detail the oral anatomy with a laboratory knife. Fill holes in the model with a quick setting stone.</p> <p>When referencing the model to the platform, make sure the base of the model is reduced flat, parallel to the occlusal surface. In some cases, the base is removed creating a flat horseshoe model to eliminate excessive material stretching.</p>
	<p>Position the model in the center of the platform, referencing the incisors toward the locking handle.</p> <p>Apply a liquid model-separating medium (Great Lakes Separator or Bioplast Insulator) to the dental casts before the material is formed.</p>

### *Use of the Pellets*

A five-pound container of pellets is supplied with each Biostar. Pellets are used to prevent the thermal-plastic material from stretching over areas of the model that are not part of the appliance design. The pellets will flatten if compressed by the pressure chamber on the rim of the cup preventing machine damage. Stainless steel pellets are also available but can cause damage to the cup's rim if compressed by the pressure chamber. Use of materials other than the manufacturer's recommended pellets may result in machine malfunction and will void the warranty.

Work models are packed in pellets:

1. to support the model so that the occlusal-incisal plane is level with the rim of the cup.
2. to prevent the material from forming on the facial surfaces of the teeth, making it hard to remove the appliance from the work model.
3. to prevent heated material from melting the wax used to support the wires on facial areas.



Enough pellets must be placed in pellet cup to hold the model at proper level. Material termination areas, located on the facial surface of the model, should be referenced at the same height as the top ledge of the pellet cup.

Models attached to articulator mountings may be referenced slightly higher than indicated.



Remove the pellet drawer and pour pellets between the model and the inner wall of the cup. Apply more than enough pellets in these areas. Use a Biostar brush to remove excess pellets and level the pellet line from the occlusal-incisal plane to the top rim of the cup. Hold the brush at an angle to sweep excess pellets from the rim of the cup and the palatal area of the model.

*Note: The pellet level should always be to the top of the cup. The height of the model in the pellets will change with various applications.*



For example, when constructing an orthodontic retainer, the pellets are placed against the occlusal-incisal margin to cover the wax holding the wires facially. The pellets act as an insulator when the heated material is formed.

Improper packing of a model (shown at left) can cause a blowout, air leak or machine malfunction. It is important that there is no sudden drop of the pellet margin at the inner cup wall or that the model is not positioned too high or low within the cup. This allows the material to be overstretched, thinning it to where a hole is created and air blows through.

In some instances, an air leak could cause inferior material adaptation that can result in a poorly fitted appliance.



Models mounted to articulator plates should be splitcast. If the model cannot be removed from the mounting, the pellet level will need to be at a slight incline; to appliance termination areas.

## Material Heating Process

Select an appropriate disc of material specific to the appliance being fabricated. Place a disc of material on the gasket of the pressure chamber. Position the clamping frame over the material, so that the bayonet clamps slip under the bevel of the locking device on the sides of the chamber. Tighten by turning the handle clockwise (do not over tighten).

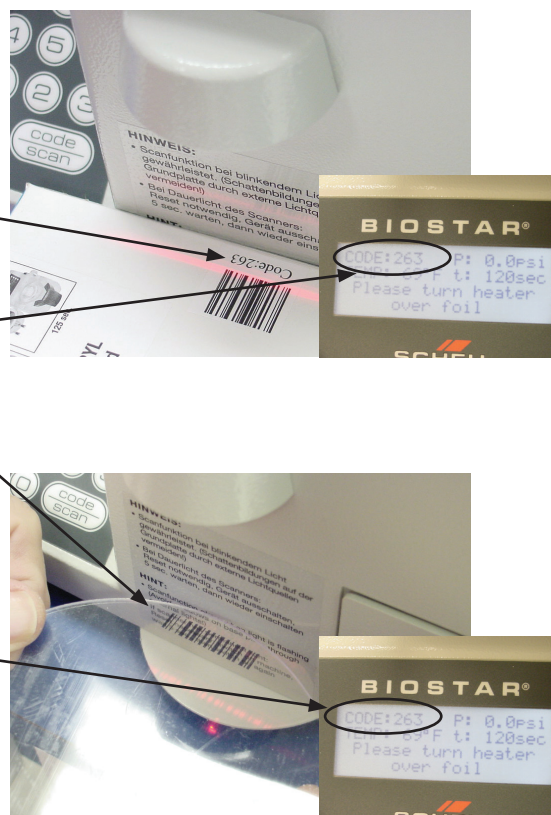


There are three options to program the heating and cooling times:

**1. Bar Code Scan:** (introduced 5/10) The bar code scanner automatically enters the correct processing information for your material. Press the “Code” button to activate the scanner.

**Great Lakes Material:** The bar code is located on the box. Hold the box under the scanner until you hear a “beep” indicating the bar code has been read. The heating code will automatically show on the display.

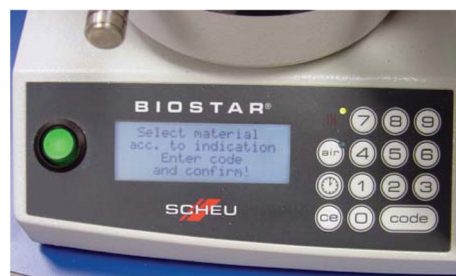
**Scheu Material:** The bar code is printed directly on the material. Hold the material under the scanner until you hear a “beep” indicating the bar code has been read. The heating code will automatically show on the display.



**2. 3 – Digit Code:** The code and recommended heating times are identified on each box of material. The codes indicate the length of time for the heating and cooling phase. To program the code, press the “Code” button, input the desired three-digit code, and press the “Code” button again to enter.

**3. Manual Entry:** To heat the material, press the button marked “Time”, enter the desired heating time, and press the “Time” button again.

You are now ready to heat the material. The Biostar display provides instructions throughout the process.





*Note: To ensure a tight seal between the pressure chamber and the cup, pellets should be completely removed from around the rim.*



To initiate heating, swing the heating element over the clamped material and the programmed time will start to count down automatically. With five seconds remaining in the heating phase, a series of short beeps will sound, at zero, a sustained beep will sound.

Swing heater back to its full rest position. Swing the chamber over the model and activate the air pressure by moving the locking handle from the back of the machine to the front of the machine until it locks.



At this point in the process, the material has been formed over the model and is cooling under pressure.

At the end of the cooling phase, a series of short beeps will sound. Release the pressure by pressing the air evacuation button. Another series of short beeps will indicate when the pressure has cleared and the chamber can be unlocked and open. To unlock the chamber, swing the locking handle from the front of the unit to the back. Move the clamping frame handle to the left until it stops releasing the material.



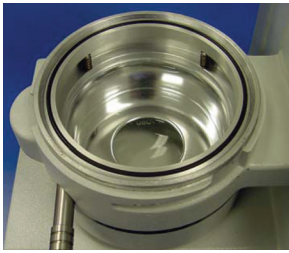
The appliance is now cool to the touch and ready for finishing.

# BIOSTAR® Troubleshooting & Fabrication Tips

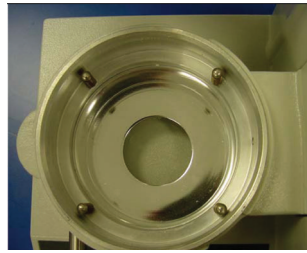
Use the following tips to address:

- Air leaks
- Poor adaptation
- Material heating unevenly
- Blowouts
- Material thinning
- Mounted model too high for pellet cup

*Note: The BIOSTAR is preset at 60lbs. or 4-5 bars of working pressure.*



If gasket does not move freely, remove it and clean with a small amount of liquid dish soap applied and removed with a dry paper towel. Lubricate pins and springs and replace gasket.



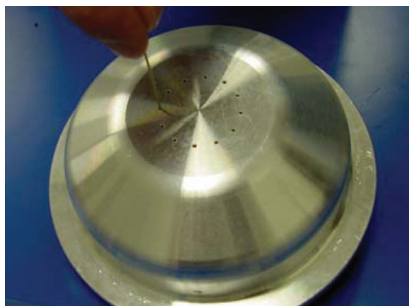
Remove pins and springs. Lubricate with small amount of grease (016-021). Replace pins and springs and insert gasket. Depress gasket ring once or twice to make sure it moves freely.

## Performing a Cold Test:

- Turn unit on. Make sure platform is in place. Clamp a sheet of 2mm (or thicker) hard material onto pressure chamber. Secure clamping frame.
- Enter 5 seconds heating time. Swing the heating element over the material to activate heat. Immediately return heating element to rest position.
- Swing pressure chamber over the model platform. Activate air pressure.
- If you hear a constant rush of air during pressurization, contact your customer service representative.



Make sure the heating surface is parallel to the heating element. See Maintenance Tips to adjust.



Remove pellets from cup, make sure the 12 air escape holes are not plugged. Use a .036" diameter or smaller wire to open plugged holes.



Make sure all pellets are removed from edge of cup where the chamber locks into place. Pellets should be even with top of pellet cup.



For mounted models, remove the majority of pellets. Leave only enough under the model to allow air to flow. Build up the pellets, leaving exposed only the area to be covered by acrylic material.



Great Lakes recommends: all soft or semi-soft material should be formed on the platform. See photo on left: the base of the model is even and flat. Use pellets for hard material (see photo on right).



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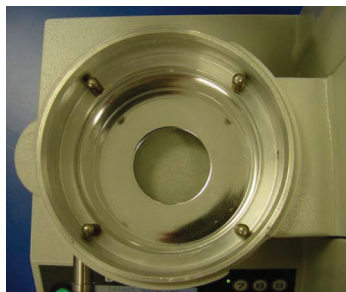
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- Troubleshooting tips to help you identify solutions

## BIOSTAR® Maintenance Tips

A regular maintenance schedule should be followed. Proper maintenance will assure better fabrication results. Refrain from using water in the Biostar® machine. Water may cause certain components to rust or corrode. When the machine is not being used, engage the clamping frame to the chamber and position the chamber on the pellet cup. This prevents lab dust from entering the pellet cup and chamber.



The reflective surface of the pressure chamber should be cleaned regularly to achieve optimum pressure molding results.

Remove the aluminum gasket from the pressure chamber. Using a light oil, clean the gasket, and chamber surface every three months.

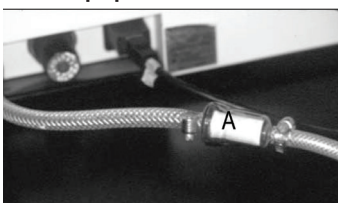


Clean and lubricate gaskets every 3 months. Apply a drop of liquid dish soap onto the gasket on the pressure chamber with a fingertip. Identify potential gasket cuts or irregularities. Remove the soap from the gasket with a soft cloth.



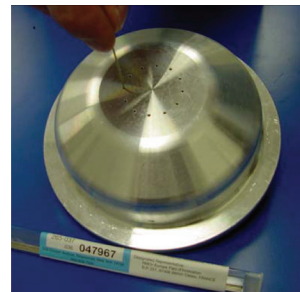
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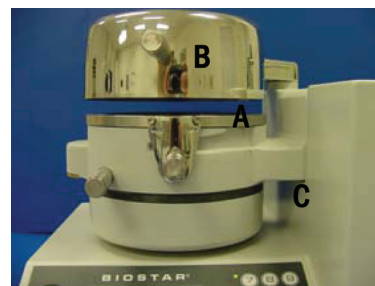


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If replacing filter, turn off the air source and bleed the high-pressure hose of air. Loosen clamps holding the filter and slide it off the hose. Position the new filter by referencing the arrow on the filter case toward the back of the Biostar.



Air escape holes are present in the base of the pellet cup and should be checked monthly to ensure that they remain open. Use a .036" or thinner diameter wire to open plugged holes. Also, make sure the rim of the pellet cup and the four blocks that support the cup are clean.



The heating surface (A) should be parallel to the heating element (B). Adjust the position of the chamber by turning the screw (C), located under the chamber support frame on the side of the unit, with a screwdriver. Counter-clockwise adjustment elevates the chamber.



# Biostar® Codes

*Example: Code # 244 =*      220°C/427°F temperature  
   24 =      100 seconds heating time  
   4 =      150 seconds cooling phase

Chart 1

## Heating Phase

Codes

220° C/427°F Standard	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Heating Time Seconds	20	25	30	35	40	45	50	55	60	65	70	75	80	90	100	110	120	140	150	160

Chart 2

## Cooling Phase

Code	Time (sec.)
0	0
1	20
2	60
3	120
4	150
5	180
6	240
7	300
8	360
9	420