

Thank you for purchasing an Evenheat heat treating oven. At Evenheat we like tools that work and work well. Not just in the tools we use but in the tools we make. Quality doesn't just happen. It takes an understanding of what you want and how to accomplish it. It takes a good eye, patience and ability. In other words: craftsmanship. We understand this and it's how we build. Evenheat is the Knife Makers Brand.

While we have used the term Knife Oven to identify and describe some of our ovens, these ovens are heat treating ovens designed specifically for the heat treating of metals. These ovens find use in many applications including knife making, gunsmithing, automotive and general machine shop work.



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Cautions & Safety

Read and understand this installation and operating manual as well as the controls manual before operating your heat treat oven. If you have any questions please contact Evenheat Kiln at 989-856-2281 or at evenheat-kiln.com.

Heat Treat Ovens are as safe as any other electrical appliance when used under normal and proper operating conditions. To create and maintain this safe environment observe all safety precautions.

Warning Symbol Descriptions

Warning symbols are used throughout this manual. These symbols alert the operator to certain hazards and important information. Pictured below are symbols used along with a description of each.



The Exclamation Point alerts you to particular cautions, hazards and information.



The Lightning Bolt alerts you to specific information regarding the risk of electric shock. Electric shock may result in injury or death.



The Heat Waves alert you to specific information regarding the risk of burn injury.

Emergency Shut Off Provision



The ovens power supply connection (plug/receptacle, breaker or disconnect) acts as the emergency electrical power shut off. Access to these devices should be unobstructed and safe at all times.

All electrical installations for direct wired models (those without a plug/receptacle connection) must include a power disconnect near the oven and that is easily accessible and safe for emergency power shutoff.

Electrical Safety



A licensed electrician should be used for all electrical installation and service. All applicable local, state and federal electrical codes must be followed.

Use correct voltage, wire size and fuse or breakers. Oven electrical requirements are located on the oven control panel nameplate. Make sure all electrical connections are tight. Avoid using aluminum wire.

Always use the proper electrical receptacle. Never alter the ovens cordset or cordset plug. Alterations can be dangerous. Alterations will void any warranties along with nullifying any Listing Agency markings.



Evenheat recommends that a voltage check be performed before placing the oven into service, ideally before actual purchase. Operating voltage varies, with common operating voltages being 208V and 240V. The ovens operating voltage (printed on the ovens nameplate) must match the applied voltage (actual electrical service voltage). If it does not, do not install or operate the oven as potential electrical and fire hazards exist. Contact Evenheat for guidance in such cases.

The oven must be properly grounded.



Unplug or disconnect the oven from the electrical service before accessing the chamber for servicing or vacuuming. Do not attempt to touch or replace the heating elements while the oven is plugged in or connected to the electrical service. Electric shock may result in serious injury or death.

Never, ever use an extension cord to operate an oven.

Oven Location Safety



Do not place or use oven on combustible surface.

Do not remove the metal stand attached to the oven by Evenheat Kiln, Inc.

The oven should be permanently positioned – it should not be considered mobile.

The surface on which the oven is placed shall be capable of safely supporting the combined weight of the oven, oven load and if the oven is located on the floor, any operating personnel.

Observe all building, fire and safety codes when installing the oven.

Do not install the oven closer than 12" (31cm) from combustible wall surface or object or 36" from any ceiling surface with the door in the opened and closed positions as well as along its travel path.

Install in a covered, well ventilated area. Do not place the oven in any structure resembling a carport or screened-in porch. Avoid areas that are subject to outdoors weather.

Never place the oven in a small, enclosed area such as a closet, cabinet or very small room. The room in which the oven is placed into service shall be capable of safely dissipating all heat produced by the oven.

Never install an oven outside. Avoid moisture.

It is the user's responsibility to be knowledgeable regarding any and all contaminants, produced by the ware during firing, and take steps to properly and legally contain and dispose of these contaminants.

It is the user's responsibility to provide ventilation capable of removing all gases, fumes and other airborne contaminants produced by the ware during firing safely from work the area and building structure.



Do not store flammable or combustible products near or in the same room the oven such as gasoline, paint, aerosol cans, paper, curtains, plastics, etc. Better yet, store these items in another separate structure designed for this purpose.

Position the power supply cables, power supply conduit, controller cables, pyrometer thermocouple leads and other materials in such a way as not to create a tripping or tangling hazard.

The area around the oven should be free of obstructions that interfere with the proper and safe operation of the oven.

Never place anything under or above the oven for storage. Absolutely nothing should be propped against the oven.

Oven Use Safety



The surface of the oven is hot and burn injuries are possible. Keep all children and unsupervised personnel away. Always wear protective clothing, gloves and eyewear when operating and handling a hot oven.



You must throw the oven's power switch to the OFF position before accessing the oven chamber. Do not access the oven chamber if the oven's power switch is at the ON position. Under no circumstances should you touch the heating elements with your body or any other devices like tools or ware. Electrical shock may result in serious injury or death.



Use care when accessing or looking into a hot oven. High heat escapes quickly and burn injury may result. When accessing or looking into a hot oven, approach slowly and wear protective clothing and gloves designed to withstand high heat and eyewear capable of filtering Infrared and Ultraviolet light.

Protective clothing should be worn when operating the oven and includes, but is not limited to, cotton clothing, heat resistant gloves and eyewear capable of filtering Infrared and Ultraviolet light.



Do not heat salts or cyanide. **Gases produced are TOXIC.** Serious injury or death may result.

Do not operate the oven over the maximum temperature rating printed on the nameplate.

Never fire an oven unattended beyond its anticipated firing time.

Do not operate the oven with the door open.

Never allow the power cord to touch the oven. If the power cord, plug or receptacle becomes damaged discontinue use and replace immediately.

It is recommended that a fire extinguisher, capable of dousing an electrical fire, be accessible in the event of fire. Smoke detectors within the oven room are also recommended.

Keep the oven door closed when not in use.



It is the user's responsibility to have knowledge of the material intended to be heat treated/fired. If you are unsure as to the safety of firing a particular material contact your materials supplier for guidance before doing so. If you remain unsure as to the safety of firing a particular material do not do it. Firing hazards include materials that explode or produce toxic gases. Finished ware hazards include materials containing lead. Materials containing lead should not be used for articles intended for food use.

Fire all materials according to the material manufacturer's instructions. Improper firing may result in damage to the oven or material.

Do not use the oven to prepare food, heat a living space, dry clothes or ice laden articles or use as a storage devise. The oven is designed for one purpose and one purpose only: the heat treating of metals.

An oven will remain very hot long after the firing is complete. All safety recommendations should be followed, even with the oven unpowered, to avoid any burn injuries. Keep children and other unauthorized personnel away.

When firing is complete, and during periods of non-use, remove power from the oven by unplugging or by throwing the disconnect or breakers to the OFF position.

Oven Maintenance Safety



Disconnect electrical power from the oven before performing any oven maintenance. Failure to disconnect the electrical power supply may result in electrical shock which can cause serious injury or death.

Replace any worn, damaged or defective parts immediately with Evenheat Kiln replacement parts only. Discontinue oven use until parts are replaced.



When vacuuming the oven use only HEPA filters on the vacuum. Prolonged expose to brick dust and other refractory materials can cause lung injury.

Inspect all electrical service connections periodically for wear.

Periodically check chamber jacket clamps for tightness. Tighten as necessary.

Intended Use

Evenheat Knife/Heat Treat Ovens are a controlled heat source designed for the sole purpose of heat treating metals. Do not use the oven for anything other than this intended purpose. It is the operator's responsibility to determine the suitability and safety of any material to be heated or heat treated. *Many materials are unsafe to heat such as various salts and cyanide which emit toxic gases when heated.* Please contact your materials supplier for guidance in the materials response to elevated temperature, suitability and required safety precautions. If you are not completely sure as to the safety of heating a particular material, don't do it.

Oven Location and Set-up

Before unpacking and setup of your heat treat oven you will need to make sure your oven location is adequate for unobstructed and safe operation.

The metal heat treating process almost always involves the removal of very hot metal from the oven during the heat treating process. To keep this process as safe as possible Evenheat recommends that the oven be placed on a work surface that positions the door at roughly waist to chest level. The goal here is to offer a simple and natural arm movement for chamber access. We would discourage placing the oven at a lower or higher level as these positions tend to complicate physical movement.

Your location should allow you room to move freely. You'll be handling some very hot material and the last thing you need is a restricted space. So, give yourself some room!



Your work surface (surface on which the oven is placed) and floor surrounding your work surface should be constructed of a non-combustible material. Do not place the oven on a combustible work surface. While overall oven safety in the event of failure is important, the more likely event may be that very hot material being transferred to or from the oven may be accidentally dropped. If combustible material is present in either the work surface or floor surrounding your work surface this would constitute of a fire hazard.

Your oven should be placed no closer than 12" from any wall or 36" from any ceiling surface. These distances should be maintained throughout the travel path of the oven door as well as with the door in its fully closed and fully opened positions. All flammable and combustible materials should be removed from the oven area.

While it's not absolutely necessary that walls and other structures be non-combustible we do like the idea of using some type of concrete based sheeting on these areas. This material is readily available at most home improvement stores.

The oven location must be strong enough to support the weight of the oven, personnel as well as ware to be fired. Please note again that the surface on which the oven is placed should be made of a non-combustible material.

Your heat treat oven is equipped with power supply cable fitted with a molded-on plug. A corresponding receptacle should be located near the oven's setup location. The position of the receptacle should be such that the ovens' plug easily reaches and plugs without strain. Stretching the cable to plug it in can cause receptacle failure, avoid this. The power supply cable must also be positioned in such a way as to avoid a tripping or tangling hazard.

Electrical Requirements

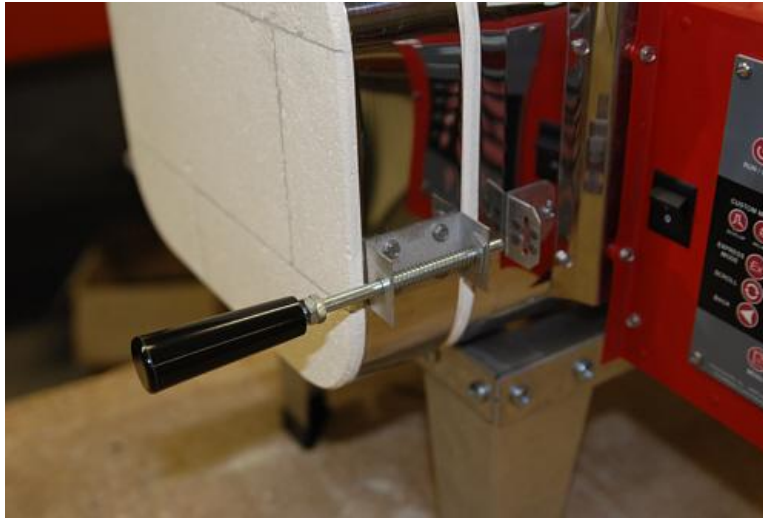
Evenheat heat treat ovens are powered electrically. It is recommended that the oven be operated from a dedicated circuit. That is, the oven should be the only device being operated from the circuit. It is also recommended that all electrical installations be performed by a licensed electrician.

Model	Voltage	Amperage	Watts	Minimum Wire Size	Breaker/Fuse	Electrical Receptacle
KH 414, KH 418	120V	13A	1560W	12AWG	15A	NEMA 5-15R
KF 13.5, KO 13.5, KF 18, KO 18, LB 18	240V	13A	3120W	12AWG	20A	NEMA 6-20R
KF 22.5, KF 27, KO 22.5, LB 22.5, LB 27	240V	15A	3600W	12AWG	20A	NEMA 6-20R
KF 31.5, KF 36, KF 40.5, KF 45, KF 49.5	240V	30A	7200W	6AWG	50A	NEMA 6-50R

Use copper wire only, do not use aluminum wire. Wire size is a minimum and is intended for runs less than 40 feet. Wire and breaker/fuse sizes are for reference only. Electrical installation must comply with all local codes.

Door Handle/Latch Installation and Use

The oven door handle must be attached before use and will be found packed with the instructions. Simply thread the handle onto the handle stud, located on the oven door, until it stops. Then, using a 7/16" wrench, back the jam nut up to the handle and tighten to lock.



To close and latch the door for use: Close the door using the handle and continue to push forward on the handle to insert the keyed handle stud into the keyed receiver attached to the oven and rotate 90° to secure.

To open and unlatch the door: Push slightly on the door handle while rotating the handle 90°. Pull the handle away from the oven to open.

Power Interrupt Switch



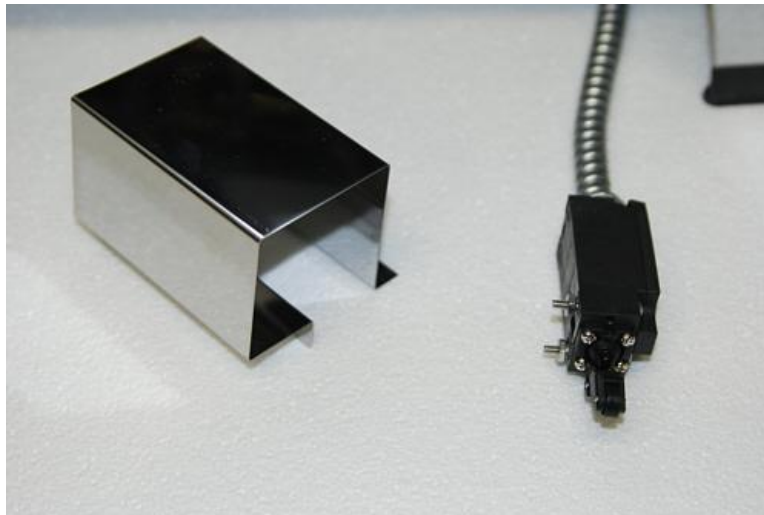
Your oven may be equipped with a power interrupt switch that is designed to automatically remove power from the heating elements as the oven door is opened. This automatic power interrupt switch adds an additional level of security against electrical shock. However, this power interrupt switch, like any mechanical device, can fail. Do not touch the heating elements with anything without first unplugging the oven from the electrical service.

The automatic power interrupt switch is located on the lower door hinge. The switch uses a camming action as the door is operated to activate the switch. Do not alter or modify this switch assembly in any way.

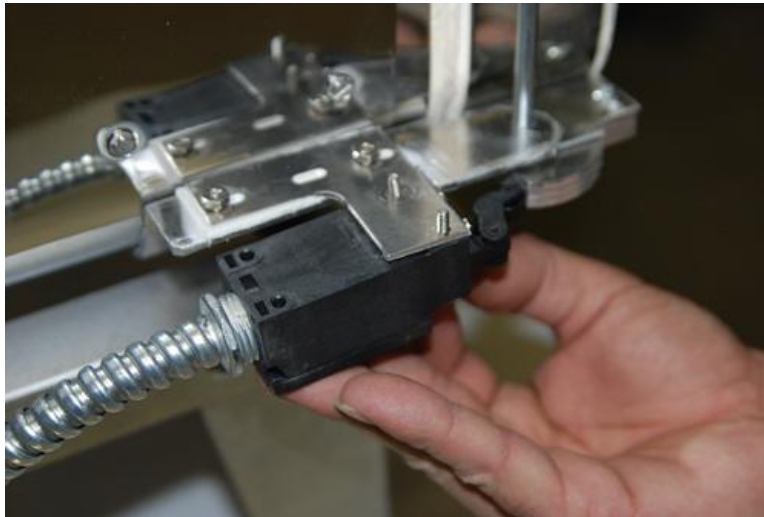
This switch has been removed from its mounting for shipping. Installation of this switch is necessary before oven use.

Power Interrupt Switch Installation

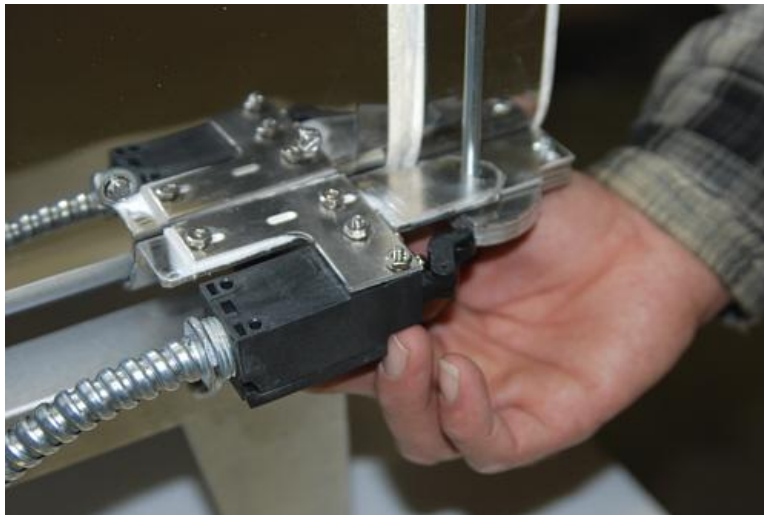
Tools Needed: 1/4" Nutdriver or wrench (Nutdriver is the better choice), 5-16" Nutdriver or Wrench, Standard Screwdriver



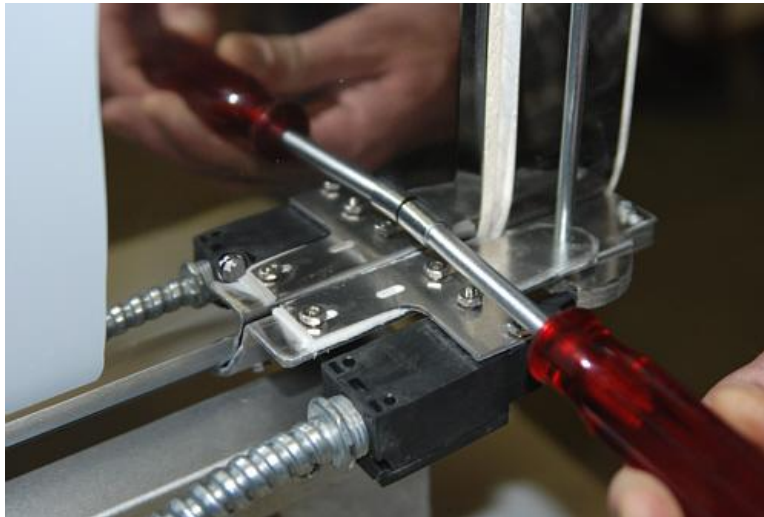
Locate Power Interrupt Switch (attached to oven with conduit) and Cover Plate



Position the Interrupt Switch on the Switch Mounting Bracket, located towards the bottom left of the oven door, and Install the 6-32 x 1-1/4 Bolts as Shown



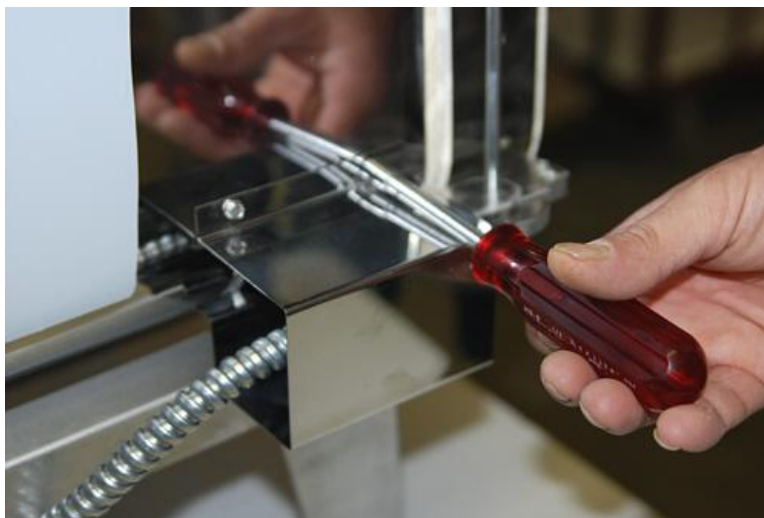
Secure the Switch to Mounting Bracket with Included Washers and 6-32 Nuts. When Securing, Square-up the Switch to the Mounting Bracket.



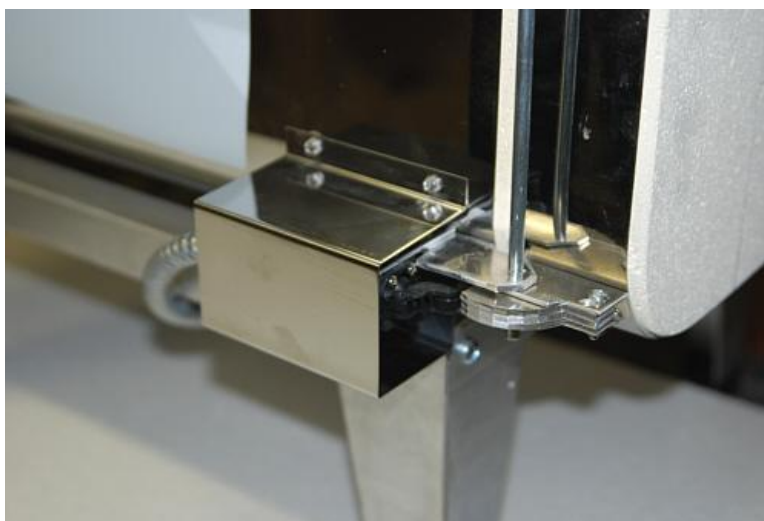
Remove the two #6 Power Interrupt Cover Plate Mounting Screws from the Oven Body



Place the Power Interrupt Cover Plate Against the Oven Body as Shown



Secure the Power Interrupt Cover Plate with the two #6 Screws as Shown



Power Interrupt Switch Installation is Complete.

Temperature Controls

Our ovens are equipped with our Set-Pro, Rampmaster or TAP temperature controls. Separate operating instructions have been included with your oven.



Scan this QR code to view instructional programming videos for the Evenheat Set-Pro, Rampmaster and TAP controls.

You will also find these instructional videos and manuals on our web site www.evenheat-kiln.com

Thermocouple

The thermocouple is the temperature sensor and is located in the ceiling of the knife oven. The thermocouple is a rugged component that can take some abuse but try to avoid hitting it if you can. The thermocouple passes through the chamber ceiling and is connected to a block fastened to the outside of the oven. From this block, extension wire runs directly to the electronic controls. Care should be taken to see that the extension wire be kept from harm. If the extension wire becomes damaged it must be replaced with TYPE K extension wire only which is available from Evenheat. Replacing it with any other type of wire will introduce an error into the temperature reading.

The thermocouple works best if it's not crowded against your work. Give it as much room as practically possible. Avoid blocking the thermocouple from the sides, particularly both sides at once.

If thermocouple replacement is necessary replace only with a TYPE K thermocouple which is available from Evenheat. Replacing it with any thermocouple type other than TYPE K will introduce an error into the temperature reading. So, TYPE K only.

Loud Alarm Output Jack – TAP & Rampmaster Equipped Models Only

If your knife oven is equipped with a TAP or Rampmaster control it is also equipped with an output jack intended for use with our Loud Alarm option (serial numbers 107120 and greater). This output jack is located on the underside of the oven control panel. The Loud Alarm option is an audible alarm capable of producing an 80db+ sound that cuts through a lot of shop noise. The alarm is designed to sound at the beginning of the process temperature, and more importantly, at the end of the process temperature when quenching must occur.

The Loud Alarm output jack supplies a modulated 12Vdc, 300mA output. See page 24 of this manual for installation instructions.

Initial Use

We recommend operating the oven empty before attempting any heat treating operations. This serves a few purposes: It allows you to become familiar with the controls, it allows the elements to develop a protective oxide coating and it introduces you to accessing the chamber under high heat conditions.

Close the oven door and program and run your controls for a rate of 1000°/hour to 1800°F and hold for 10 minutes. See the included controls operating instructions for details. As the oven is heating you'll notice a clicking sound along with an increasing chamber temperature. The clicking sound comes from the control relay as it turns the heating element on and off.

Once the oven has reached temperature and finishes holding it will go to the Idle or Standby condition (depending on control). The control is no longer running the program and is off. This would be a great time access the oven chamber and learn what high temperature is going to look and feel like during actual use. Before accessing the oven, throw the control power switch to the OFF position (0).



Before you access the chamber we need to go over some rules!! High heat will escape very quickly. Keep your body well away from the chamber, particularly your face. We also recommend that you wear loose fitting cotton clothing, wear eye protection capable of filtering Ultraviolet and Infrared light and tie all hair back. Always approach the chamber slowly.

Ready? Stand back and extend your left hand to the door latch, rotate the latch and slowly open the oven door. Feel that rush of heat? We weren't kidding when we said it escapes quickly. This is the environment you will be working in.

During use the heating element(s) produce a naturally occurring, protective oxide coating. Their appearance will have gone from a shiny to dull look. This is normal and welcome.

Loading the Oven



Before loading (or unloading) the oven, throw the power switch to the OFF position. This is a question of safety. Contact with electrically charged heating elements may result in serious injury or death.

There are those who load their blades in the oven cold and those who prefer to load the oven once it has reached temperature. We prefer loading the oven cold for a few reasons. Placement of your materials is much easier and more comfortable in a cold oven as opposed to one that's hot. We also tend to like the idea of the blades coming up to temperature with the chamber. Having said that, there are many who prefer to load a hot oven. In either case, the oven power switch should be in the OFF position when loading.

Blades should be placed in a blade fixture such as our MK1 and MK2 blade fixtures. These types of fixtures hold the blades vertically. Vertical placement is necessary to bathe the blade in heat which helps to prevent warping. As you can imagine, we do not recommend placing the blades flat on the oven floor. You can load the blade fixture that is already placed in the oven or you may load the blade fixture on the bench and move it to the oven. We prefer placing the blade fixture into the oven and then loading the blades. When placing the blade fixture into the oven attempt to center it from left to right.

When placing any material into the oven avoid making contact with the heating elements and thermocouple.

We recommend placing your blades no closer than 1-1/2" from the heating elements. Use of our blade fixtures will place your blades at the proper distance and we do recommend their use.

Once the blades are properly loaded and positioned close the oven door and latch it. You are now free to throw the power switch the ON position and perform your heat treating operation.

Running the Oven

Once your blades are loaded and the oven door has been latched closed it is now time to run the heat treating process. Your knife oven is supplied with the Set-Pro, Rampmaster or TAP controls. A separate operators manual has been included with your oven describing the use of these controls. The operators manuals for these controls can also be found on our web site www.evenheat-kiln.com.

We have included heat treating data starting on page 14 of this manual. This particular data has been supplied to us by various sources. There are many other sources out there that deal not only with the actual temperatures and times but techniques and procedures as well. We encourage you to seek this information.

Entering the Chamber While Hot

Generally speaking you will not enter the oven chamber while the heat treating program is in process. You will, however, enter the oven chamber at the very end of the process which means the chamber can be very hot (up to 2400°F).



Before entering the oven throw the power switch to the OFF position. Contact with electrically charged heating elements may result in serious injury or death.



Operate the latching action of the door handle and slowly open the oven door. Approach the oven slowly, high heat escapes quickly. Use tongs to remove the blades for quenching.

Once all blades are removed shut the oven door. This helps to retain heat in the fire brick for any subsequent tempering processes.

Periods of Non-Use

Throw the oven power switch to the OFF position when the oven is not in use. Keep the oven door latched closed as well. You're free to leave your blade fixture in the oven at all times.

Don't store anything on or around the oven.

Reduction Atmospheres

It is permissible to introduce the inert gases of Argon, Helium or Nitrogen into the heating chamber.

Observations and Tips

There are two schools of thought on when to load blades in the oven: cold oven or hot oven. People do both. If it makes no difference to you we would choose loading cold. We tend to like the idea of the blade responding to temperature changes over a longer period of time. That being said, the choice is yours. We do suggest using some type of fixture to hold knife blades vertical to prevent warping regardless of loading procedure. We do offer such blade fixtures.

While our temperature controls do allow you to control the rate of heating it is generally accepted that the rate ($^{\circ}\text{F}/\text{hour}$) of heating can be As Fast As Possible. However, we do recommend slowing the rate of temperature increase for the tempering process to avoid overshooting the lower temperatures involved (500 $^{\circ}\text{F}/\text{hour}$ is a good place to start).

To achieve As Fast As Possible with our TAP and Rampmaster controls simply choose a rate of 9999. To achieve As Fast As Possible with our Set-Pro control simply choose a rate of Full.

A vast majority of heat treat firings are simple up to temperature, hold for a period of time and then shut off sort of things. In the world of controls this type of firing is referred to as a 1 segment firing. As you program either the Set-Pro or Rampmaster controls they ask how many SEGS you want to use. The simple answer is 1. In the event that your heat treating program requires more than 1 segment, you're welcome to do so.

As we just noted, most heat treat programs are 1 segment affairs. The data in the following tables are all 1 segment programs. Our tables are set-up in the order in which you will program the controls: number of segments first, then rate, then temperature then hold time.



Before removing any of your work from the oven, throw the power switch to the off position. Safety first and we thank you!

Complete Heat Treating generally involves both hardening and tempering (drawing). Harden first then Temper. These are two separate processes and require different temperatures and different hold times. The following tables are labeled as Hardening and Tempering.

Hardening is a one-time firing process. It's usually never repeated on the same piece unless you screw up and need to take another shot at it.

Tempering is often a repeated process. That is, your steel may require you to perform the tempering operation more than one time. It's not always the case but you will see in the following tables that some steels require up to 3 tempering firings.



How to quench or quickly cool your metals once at harden temperature? Air Quench? Oil quench? Plate Quench? Other? It's up to you and your needs. We would tell you to be careful when pulling the metal for quenching. Opening the oven allows heat to escape quickly, do so carefully and move slowly to the chamber to avoid burns. You don't need any more scars.

Heat Treat Data

The following heat treat data is taken from many sources and may or may not give you exactly what you're looking for. Such is the nature of the beast. We suggest using this data more as a starting and reference point from which to build your heat treating experience. You are encouraged to seek out more specific data and procedural information regarding your specific metal. Such information is available from your steel suppliers and manufacturers as well as published books and, of course, the internet.

Heat Treating Data for Hardening – Special Thanks to Texas Knifemakers Supply for this data

The following data was provided by Texas Knifemakers Supply. Keep in mind that this is what works for Texas Knifemakers Supply. Remember, this data should be viewed as a starting and reference point on which to build your experience.

Texas Knifemakers Supply also adds the following helpful information: These figures are based on 3/16" thick material and should be altered to the thickness of the material being treated. (I.E. 1/8" thick material should be 8 to 10 minutes and 1/4" material should be near 20 minutes). The rule of thumb is 1 hour per inch of thickness.

You will note on the table that we have shown information in the order in which you will program your Set-Pro or Rampmaster control: Number of segments first, rate used to reach temperature, the hardening temperature and the amount of hold time at the hardening temperature.

HARDENING Special Thanks to Texas Knifemakers Supply for this data				
Steel Type	Number of Segments Used in Program	Rate to Reach Hardening Temperature	Hardening Temperature	Hold Time at Temperature
D2 Tool Steel	1	9999 or Full	1880°F	15 minutes
D2 Tool Steel Springs and Rockers	1	9999 or Full	1880°F	15 minutes
154CM S.S.	1	9999 or Full	1900°F	15 minutes
154CM S.S. Springs and Rockers	1	9999 or Full	1900°F	15 minutes
440C S.S.	1	9999 or Full	1880°F	15 minutes
440C S.S. Springs and Rockers	1	9999 or Full	1880°F	15 minutes
CPM 440V S.S. (S60V)	1	9999 or Full	1950°F	30 minutes
CPM 440V S.S. (S60V) Springs and Rockers	1	9999 or Full	1950°F	30 minutes
ATS-34 S.S.	1	9999 or Full	1900°F	15 minutes
ATS-34 S.S. Springs and Rockers	1	9999 or Full	1900°F	15 minutes
Vascoware & Cru-ware	1	9999 or Full	1950°F	30 minutes
Boye Dendritic S.S.	1	9999 or Full	1880°F	30 minutes
440A S.S.	1	9999 or Full	1880°F	15 minutes
CMP420V	1	9999 or Full	2150°F	10 minutes

Heat Treating Data for Tempering – Special Thanks to Texas Knifemakers Supply for this data

The following data was provided by Texas Knifemakers Supply. Keep in mind that this is what works for Texas Knifemakers Supply and relates directly to the hardening data they provided. Remember, this data should be viewed as a starting and reference point on which to build your experience.

You will note on the table that we have shown information in the order in which you will program your Set-Pro or Rampmaster control: Number of segments first, rate used to reach temperature, the tempering temperature and the amount of hold time at the tempering temperature.

TEMPERING					
Special Thanks to Texas Knifemakers Supply for this data					
Steel Type	To Achieve Rockwell Hardness	Number of Segments Used in Program	Rate to Reach Hardening Temperature	Tempering Temperature	Hold Time at Temperature
D2 Tool Steel	58 RC	1	9999 or Full	500°F	2 hours – 2 times
D2 Tool Steel Springs and Rockers	43 to 45 RC	1	9999 or Full	1200°F	2 hours – 1 time
154CM S.S.	58 RC	1	9999 or Full	400°F	2 hours – 2 times
154CM S.S.	61 RC	1	9999 or Full	275°F	2 hours – 2 times
154CM S.S. Springs and Rockers	43 to 45 RC	1	9999 or Full	1200°F	2 hours – 1 time
440C S.S.	58 RC	1	9999 or Full	225°F	2 hours – 1 time
440C S.S. Springs and Rockers	43 to 45 RC	1	9999 or Full	1100°F	2 hours – 1 time
CPM 440V S.S. (S60V)	58 RC	1	9999 or Full	300°F	2 hours – 2 times
CPM 440V S.S. (S60V) Springs and Rockers	43 to 45 RC	1	9999 or Full	1100°F	2 hours – 1 time
ATS-34 S.S.	58 RC	1	9999 or Full	400°F	2 hours – 1 time
ATS-34 S.S.	61 RC	1	9999 or Full	275°F	2 hours – 1 time
ATS-34 S.S. Springs and Rockers	43 to 45 RC	1	9999 or Full	1200°F	2 hours – 2 times
Vascoware & Cru-ware		1	9999 or Full	1000°F	2 hours – 3 times
Boye Dendritic S.S.		1	9999 or Full	400°F	1 hour – 2 times
440A S.S.		1	9999 or Full	212°F	2 hours – 1 time
CMP420V		1	9999 or Full	400°F	2 hours – 2 times

Heat Treating Data for Hardening – Special Thanks to Ranger Original for this data

The following data was provided by Ranger Original. Keep in mind that the following data is what works for Ranger Original. Remember, this data should be viewed as a starting and reference point on which to build your experience.

Rob Ridley of Ranger Original supplied us with heat treat data that we have put into table form. However, his text struck us as quite instructional so we have chosen to include it as well.

154CM, CPM154, ATS34

All three of these heat treat the same. After a full speed ramp up to temperature, they soak 45 minutes to an hour in the Evenheat Oven at 1950°F. Then they get placed – still in the foil – spine down – then flat - on a 1” aluminum plate. The second aluminum plate is placed on top and pressure is applied. We used to use weights for the pressure, but now we use clamps. You are looking for good firm contact. If you are thinking hydraulics you are thinking WAY too much pressure. After 2 minutes (or less) they will be hand cool, and ready to remove from the foil for cryogenics. They don’t have to go straight into cryo, but aim for something less than an hour from plate quenching. We use liquid nitrogen for cryo but dry ice in acetone will also do. The household freezer is no use at all. They probably only need a couple hours in cryo, but we leave them overnight.

The next morning, they will be in the range of RHC 63+. After warming to room temperature, they get tempered. We temper twice at 500°F for two hours each time – to get about RHC 61. You can experiment for other hardness's but 61 is a very good target for these steels.

CPMS30V

Same wrap – same temperature (1950°F) - same soak time – same plate quench – same cryo as 154CM above. This steel gets double tempered at 400°F for about RHC 60

440C

Same wrap – Harden at 1900°F and only about 15 minutes at temperature – then plate quench and cryo as above. Hardness out of cryo will be about 61. Temper (twice for 2 hours) at 275°F for RHC 60 – 325°F for RHC 59 – and 375°F for an excellent RHC 57-58.

HARDENING Special Thanks to Ranger Original for this data				
Steel Type	Number of Segments Used in Program	Rate to Reach Hardening Temperature	Hardening Temperature	Hold Time at Temperature
154CM	1	9999 or Full	1950°F	45 to 60 minutes
CPM154	1	9999 or Full	1950°F	45 to 60 minutes
ATS34	1	9999 or Full	1950°F	45 to 60 minutes
CPMS30V	1	9999 or Full	1950°F	45 to 60 minutes
440C	1	9999 or Full	1900°F	15 minutes

Heat Treating Data for Tempering – Special Thanks to Ranger Original for this data

The following data was provided by Ranger Original. Keep in mind that the following data is what works for Ranger Original and relates directly to the hardening data they provided. Remember, this data should be viewed as a starting and reference point on which to build your experience.

Rob Ridley of Ranger Original supplied us with heat treat data that we have put into table form. However, his text struck us as quite instructional so we have chosen to include it as well.

154CM, CPM154, ATS34

All three of these heat treat the same. After a full speed ramp up to temperature, they soak 45 minutes to an hour in the Evenheat Oven at 1950°F. Then they get placed – still in the foil – spine down – then flat - on a 1” aluminum plate. The second aluminum plate is placed on top and pressure is applied. We used to use weights for the pressure, but now we use clamps. You are looking for good firm contact. If you are thinking hydraulics you are thinking WAY too much pressure. After 2 minutes (or less) they will be hand cool, and ready to remove from the foil for cryogenics. They don’t have to go straight into cryo, but aim for something less than an hour from plate quenching. We use liquid nitrogen for cryo but dry ice in acetone will also do. The household freezer is no use at all. They probably only need a couple hours in cryo, but we leave them overnight.

The next morning, they will be in the range of RHC 63+. After warming to room temperature, they get tempered. We temper twice at 500°F for two hours each time – to get about RHC 61. You can experiment for other hardness's but 61 is a very good target for these steels.

CPMS30V

Same wrap – same temperature (1950°F) - same soak time – same plate quench – same cryo as 154CM above. This steel gets double tempered at 400°F for about RHC 60

440C

Same wrap – Harden at 1900°F and only about 15 minutes at temperature – then plate quench and cryo as above. Hardness out of cryo will be about 61. Temper (twice for 2 hours) at 275°F for RHC 60 – 325°F for RHC 59 – and 375°F for an excellent RHC 57-58.

TEMPERING Special Thanks to Ranger Original					
Steel Type	To Achieve Rockwell Hardness	Number of Segments Used in Program	Rate to Reach Hardening Temperature	Tempering Temperature	Hold Time at Temperature
154CM	61 RC	1	9999 or Full	500°F	2 hours – 2 times
CPM154	61 RC	1	9999 or Full	500°F	2 hours – 2 times
ATS34	61 RC	1	9999 or Full	500°F	2 hours – 2 times
CPMS30V	60 RC	1	9999 or Full	400°F	2 hours – 2 times
440C	60 RC	1	9999 or Full	275°F	2 hours – 2 times
440C	59 RC	1	9999 or Full	325°F	2 hours – 2 times
440C	57-58 RC	1	9999 or Full	375°F	2 hours – 2 times

Heating Elements

The heating elements we install in our knife ovens are made of a special alloy that promotes long life and element retention. Under normal operating conditions you should easily get 10+ years of life. Normal operating conditions means you avoid getting debris on the elements, you don't go beyond the rated oven temperature and you don't smoke up the chamber.

There is one maintenance issue that you can periodically perform on the elements/element grooves: vacuuming! Unplug the oven and carefully vacuum the entire element groove. There's no need to be rough just run the vacuum along the grooves. This helps to remove any loose debris that may accumulate in the grooves.

Thermocouple

The thermocouple is your temperature sensor. It's located in the ceiling of the oven. Our standard thermocouple is known as a Type K. The term "Type K" refers to the type of alloys used to manufacture the thermocouple. We've chosen a gauge that is small enough to respond quickly to temperatures yet not so small that it's delicate. It's a good match with our controls.

The thermocouple itself needs no maintenance other than replacement if it fails. Failure of the thermocouple is seen as an error message on the controls.

The thermocouple must be replaced with another Type K thermocouple. There are many "Types" out there but only a Type K will work properly. Using a different "Type" will introduce an error into the temperature reading and that's not a good thing. For best results replace your thermocouple with an original Evenheat thermocouple.

To replace the thermocouple first unplug the oven and allow it to return to room temperature.

The thermocouple is part of an assembly that is located in the ceiling of the oven. Simply remove the 2 screws that fasten the assembly to the oven and pull it from the oven.

Loosen the 2 screws that fasten the thermocouple to the oval shaped block and remove the thermocouple. The damaged thermocouple is now free and can be disposed of.

Attach the replacement thermocouple to the oval shaped block being mindful to place the red thermocouple lead to the red thermocouple lead wire. Tighten the screws fairly snug. If you hook it up backwards, don't worry, you won't hurt anything, the controller just won't work.

Insert the thermocouple into the oven and re-fasten the thermocouple assembly to the jacket. That's it.

Control Relay Replacement via the Relay Access Port

The oven uses a device called a relay (a.k.a. contactor) to control power to the heating element. During use the relay continually turns on and off to maintain the proper kiln temperature. The relay is a service part and is likely to need replacing at some point.

To make servicing (replacement) of the relay as simple and as easy as possible Evenheat has provided an external, relay access port (Pat. Pend.). Unlike competing brands, it is not necessary to remove the entire control enclosure to gain access to the control relay. The relay access port allows relay replacement by simply removing the access plate located on the outside of the kiln control enclosure.

It is highly recommended that you use an Evenheat factory replacement relay. The Evenheat part number for the replacement relay is #11801.200. Replacement with non-Evenheat factory parts may result in improper operation.



Except for servicing, the relay access port plate must be secured to the control enclosure at all times. Do not operate the kiln without this Relay Access Port Plate in place and properly secured to the control enclosure. Failure to do so may result in electric shock resulting in serious injury or death.

To replace the relay:

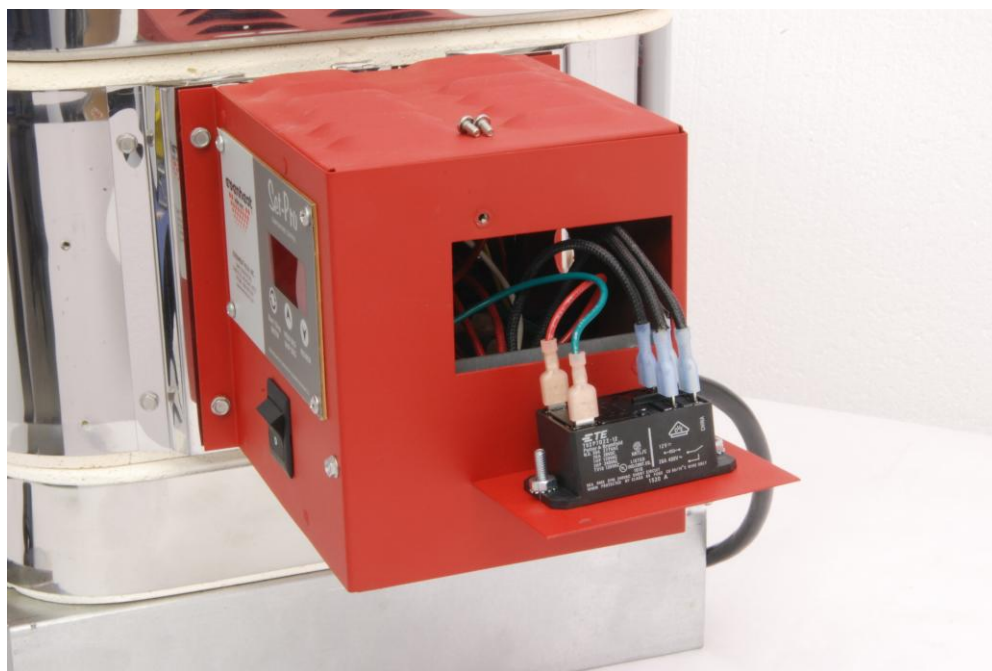
Unplug the oven. You should always unplug the oven before any servicing.



Locate the relay access port (Pat. Pend.) plate on the oven control enclosure.



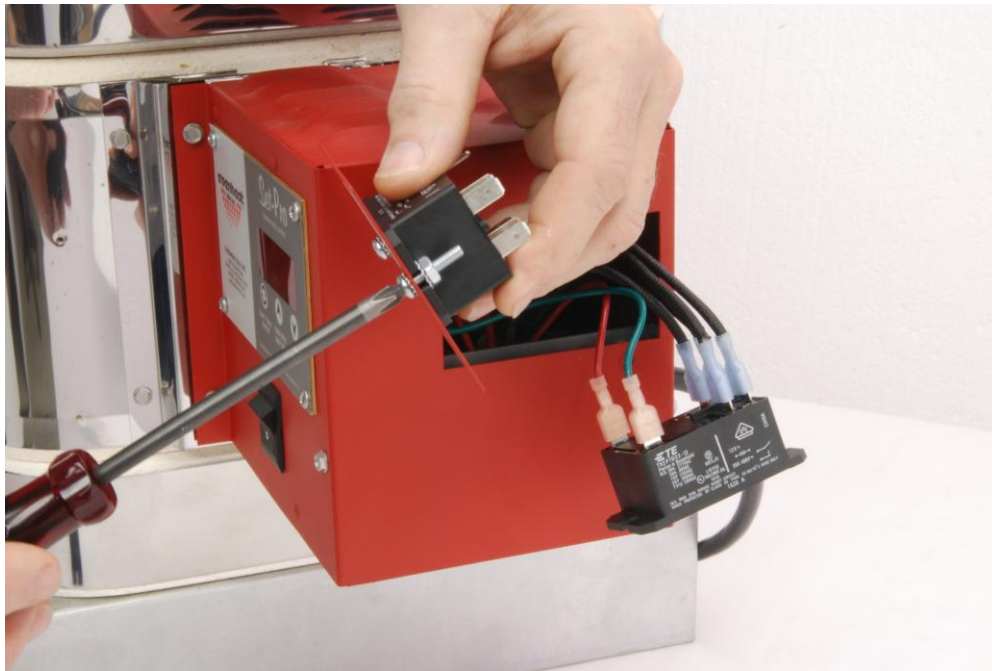
Remove the 2 screws that secure the relay access port to the control enclosure as shown.



Pull the relay access plate away from the control panel to expose the relay as shown.



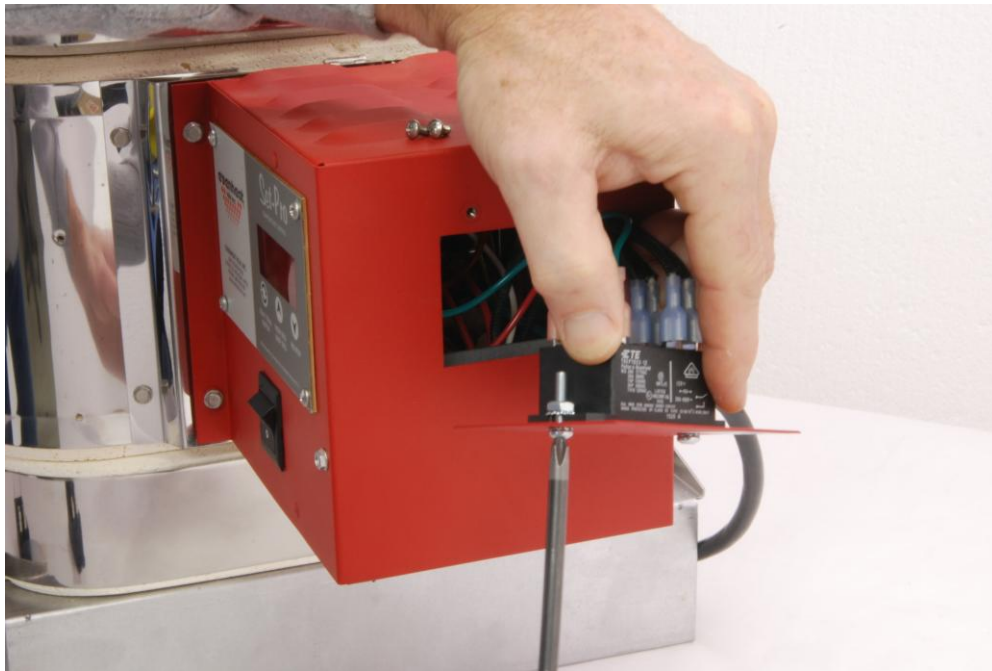
Transfer the wires from the old relay to the new relay as shown. We recommend moving one wire at a time from the old relay to the new so as not to get confused on proper wire placement. *When removing wires from the relay it is best to pull and wiggle on the pink and blue terminals to free them from the relay. You will want to avoid pulling on the wires themselves.*



Remove the old relay from the access plate as shown.



Old relay shown removed from the access plate.



Attach the new relay to the relay access plate as shown.



Place the relay access plate back into the access port as shown and secure with the included screws as shown.
Relay replacement is now complete. That was easy!

Set-Pro, Rampmaster & TAP Controls

All of our controls are maintenance free. In the unlikely event that you do need to replace a controller we invite you to visit our web site for detailed replacement instructions complete with images and text. You'll find it at www.evenheat-kiln.com. Click on Technical in the upper navigation bar and choose Knife Ovens.

Fire Brick

The insulating fire brick while strong, can be damaged with rough handling. Generally speaking, damage that is small or minor may be ignored. Any brick damage that affects performance should be repaired, such as brick that holds the heating elements in place. If you need to repair any brick please contact us for assistance and preferred repair methods.

Control Fuse

The electronic controls are protected with a control fuse located in a fuseholder on the backside of the oven control panel. The fuse is rated at 250V/250mA, slo-blo. If replacement is necessary, replace only with a fuse of the same rating.

Cleaning

Period vacuuming of the oven chamber removes debris that may damage the heating elements. A gentle vacuuming with a soft brush is perfect. Pay particular attention to the element grooves. Unplug the oven before vacuuming.

The oven jacket is Stainless Steel and requires no real maintenance or cleaning.

The oven control panel requires no cleaning.

Blade Fixtures

Evenheat manufactures a line of blade fixtures designed specifically to hold your blades vertically and securely. They're well designed and provide ample space for foil inflation while being absolutely stable. If you're heating treating knives you'll definitely want to use fixtures such as these. Please visit our web site for details, www.evenheat-kiln.com.

Installation of the Optional Alarm Kit

Evenheat offers an optional alarm kit that produces a loud (80db+) alarm to cut through shop noise. This alarm kit can be installed on Evenheat KF, KO and KH Series Knife Ovens with a serial number of 107120 and greater. Models with serial numbers below 107120 are NOT designed to accept the installation of this alarm kit.

Alarm Kit Contents:

- Alarm device with attached wiring and plug
- Alarm mounting bracket
- 2 - #6 mounting screws (a 1/4" nutdriver is needed to install)



The Alarm is attached to the bottom surface of the oven control panel as shown below.

Simply use the provided screws to attach the alarm mounting bracket to the existing mounting holes found at the bottom surface of the control panel.

Insert the alarm plug into the existing jack built into the bottom surface of the control panel.

Installation complete.



Evenheat Kiln, Inc. guarantees to the original purchaser that for a period of two full years from the date of purchase the oven will be free of defects in workmanship and materials when used under normal and proper operating conditions. Evenheat will replace or repair any defective part as specified below.

FOR THE WARRANTY TO BE EFFECTIVE THE PURCHASE MUST:

Provide written proof of date of purchase. (Warranty card sent in at time of purchase.)

Notify the Evenheat Distributor/Dealer from whom the oven was purchased, within 10 days after defect has been discovered.

Make oven immediately available for inspection.

FOR WARRANTY REPAIRS:

Warranty repairs should be handled through the Distributor/Dealer from whom the oven was purchased, who will arrange for any repairs or replacement of parts under the terms of this warranty upon receipt of the oven (or defective part). Otherwise the defective part may be returned (postage prepaid) to Evenheat Kiln, Inc. P.O. Box 300 6949 Legion Drive Caseville, MI 48725. If, after factory examination, the original part is found to be defective, a new or repaired part will be shipped prepaid by Evenheat Kiln, Inc.

If the entire oven is to be returned to the factory, all transportation costs will be borne by the purchaser. The purchaser should notify Evenheat Kiln, Inc. (989) 856-2281 prior to shipping. Evenheat will help advise the best shipping method and if it is necessary to return the entire oven or only certain parts. Warranty work will be performed within 30 days after defective part is returned to the factory.

Evenheat Kiln, Inc. reserves the right, at its option, to replace the entire oven or any part of it in order to fulfill its obligation under this warranty.

THIS WARRANTY DOES NOT COVER:

Freight damage, ovens altered in any way, abuse or neglect, moisture, improper storage or installation.

Ovens over fired (reaching temperature higher than melting point of ware inside oven) regardless of cause.

Ovens operated on incorrect voltage.

Improper electrical installation.

Knife Blade furniture or ware other than Evenheat made.

Ovens used for salt firing.

Ovens used for purposes other than the firing of heat treating various metals.

Ovens operated in excess of the temperature on the rating plate.

Damage to Property or personal injury that may occur from ovens that are fired on or near wood floors or combustibles.

Damage to property or personal injury that may occur from improper ventilation of the work area and building structure.

This warranty is in lieu of all other warranties, expressed, or implied.

Evenheat Kiln, Inc. neither assumes nor authorizes any Distributor/Dealer, Retailer or employee to assume for it any other obligations or liabilities in connection with Evenheat Kilns.

This warranty is limited as specified above and excludes incidental or consequential damages. Some states or providences do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.