

JEN-KEN KILNS: PRO-FUSION LINE

Models:

The ProFusion 26 240 volt 36a

The ProFusion 38 240 volt 36a

The ProFusion 52 240 volt 45a

We know you will enjoy your new Jen-Ken Kilns Pro-Fusion Kiln!

This manual is designed to familiarize you with the special operating procedures required for your new all-fiber kiln. At Jen-Ken kilns, we've conducted extensive research into developing the highest quality kilns that are able to defy conventional brick kiln firing schedules. This innovation has made our company the market leader in fiber kiln production. In this manual you'll find information about the benefits and potential limitations of this exciting new technology. Please feel free to contact us at 1-863-648-0585 with questions or comments regarding your new kiln.

Overview:

Over the years, insulated ceramic fiber technology has surpassed all industry expectations! At Jen-Ken Kilns, we've been on the cutting edge of this new technology from the beginning. Through exhaustive research we've discovered that larger pieces of glass can indeed fuse faster in a kiln that does not use a ceramic shelf or contain brick. We've think tha we have perfected the most efficient way to fire glass!

Efficiency Reason #1: TIME! When a ceramic shelf is used, the shelf and the glass both absorb heat. Glass that is fired on a fiber surface can tolerate a faster increase and decrease in heat, because Ceramic shelves absorb heat. When glass sits on a ceramic shelf and is heated in the kiln, both the ceramic shelf and glass absorb heat. Here's the thing; the heat absorption and rate of cooling is happening at two very different rates. This slows the whole process down. When glass is fired on rigid fiber alone, the glass absorbs the heat, allowing for a faster, more consistent and more efficient firing!

Efficiency Reason #2: ENERGY USE! Brick kilns absorb a tremendous amount of heat, and then hold that heat, thus slowing the cooling of the kiln. This absorption of heat energy takes time and slows the kilns heating efficiency on the way up to your process temperature and the way down to room temperature. There's nothing wrong with slow, however, using a fiber kiln can help shave hours off a firing and conserve energy. This is helpful if you want to cycle your kiln multiple times a day! A fiber kiln absorbs very little heat, so the glass is able to benefit from the heat generated by the elements. Since a fiber kiln will absorb and hold less heat, it will also radiate less heat, keeping your room cooler. This means your air conditioner doesn't have to work so hard to keep you and your room cool. This gets the job done faster, more efficiently, and costs less money in electricity.

Efficiency Reason #3: WEIGHT! Another great benefit to an all-fiber kiln is that it's extremely lightweight, compared to a brick kiln the same size. For example, The ProFusion 26 model weight 225 pounds which includes the built in stand. The same size brick kiln with the same firing space weighs about 700 pounds with a stand. If you wish to move your ProFusion 26, 38 & 52, or just want move it out of the way in the studio when not in use, this lightweight option is a dream, because the 26, 38 & 52 are on wheels.

Setting up your kiln:

Your new fiber kiln should be placed on a level floor away from high traffic areas. Out of the way of children and the curious that might want to take a peek and try to open the kiln while firing and hot. If it is to be located in a garage or warehouse, then choose the front of the garage door, where no rain or mist can blow in and affect the kiln. Fiber kilns



keep almost all the heat in the kiln and the outside is much cooler than a brick kiln, so that the kiln body itself can be as close as 12" from the back wall and 18" left and right. While kilns themselves do not catch fire, it is important to make sure that the area is safe to locate a kiln and that nothing flammable is near. Fiber kilns have much cooler exterior surfaces than brick kilns, so the distance to walls and other items around the kiln can be as little as 12" to the back and from the back wall and 18" left and right. as long as the walls of the building stay cool to the touch. **Safety Note:** Remember to never place a kiln directly on a table or solid surface. An air space is always required beneath a kiln.

Kiln Wash

Apply kiln wash to the kiln shelf according to the directions included with the kiln wash. Do not force it dry with heat or apply thick coats. Apply several (5-7) thin coats only to the surface the glass will touch. Let it dry thoroughly. Using shelf paper on top of the kiln washed shelf gives a smoother surface to your glass and to offers the most protection to the shelves. If the paper tears as the glass moves in the kiln was there is as a backup to prevent harm to the shelf. The kiln wash that is applied to the fiber or clay shelf, is a back-up, if a piece of glass shifts during firing and moves off the shelf paper. If shelf paper is not to be used, we recommended using fresh kiln wash, fiber paper 1/32" to 1/8", lava cloth or Kaiser Lee board to help protect your kiln's firing surface. The kiln wash is the back up to the other protective firing surfaces. If a mishap occurs the replacement of the larger kiln fiber or clay shelf can be expensive with truck shipping.

SAFETY FIRST!

Fiber shelf paper is a great product, but used shelf paper can be a nuisance for all of us. Be cautious and follow the manufacturer's directions for cleanup. Powder residue from kiln wash or shelf paper is hazardous to breathe. To minimize dust, lay a damp paper towel over the used shelf paper and then gently and slowly pressing the paper towel down to collect the fibers in the wetness of the towel, trying to make no dust. Make sure the kiln has been switched off before working inside the heating chamber. Vacuum cleaners with HEPA filter can work, but may still release fine dust particles into the air right through the filter. Papyrus brand shelf liner paper holds together better than most and can be reused 2-3 times. Please contact your shelf paper supplier for other safety precautions for their products. You can also add kiln wash between firings by sifting a light coat of the kiln wash powder over the painted coats of kiln wash with a fine mesh strainer. Always wear an approved dust mask for fine powders when working with kiln wash and shelf papers.

Boron Nitride for Molds Not Kiln Shelves

Boron nitride is another good product that can work well on the slumping molds, both stainless and ceramic. It is usually applied as an aerosol spray. It only takes 3 thin coats (not thick coats) to give a slippery non-stick surface. A light spray touch-up is required between firings. You can use this over attached kiln wash on ceramic molds after the loose powders have been clean up with a damp paper towel, but you cannot apply kiln wash over Boron Nitride. While applying BN with a spray can, protect the walls of the kiln and the coils from the spray using paper around the interior. Isopropyl alcohol can be used to remove BN over-spray on some surfaces. A special note to remember is that boron nitride is great for molds, but it tends to stick to glass if taken much over 1425°F-1450°F. So, BN is not good for higher temperature fusing by itself. We would only use it as a backup to the shelf paper that is placed on top.

Removing a Finished Project

The floor of your fiber kiln is relatively soft when compared to a clay shelf. Dragging glass across the floor or using your finger nails or a tool to lift the glass off a surface that need to be protected is difficult. Glass should be lifted gently. Many artists use suction cups, purchase from the auto supply store, to remove the glass from the kiln so that they do not disturb the liner paper. Remember to lift slowly as not to make a whirlwind of dust in the kiln. Shelf paper or fiber paper will not protect floor from gauges and scratches from sliding glass, these are only an aid in surface release. Divots, scratches and gauges can be repaired if necessary. Please contact Jen-Ken Kilns for repair instructions.

Controllers and Firing Schedules

The Orton 3 button controller is standard on our Bonnie Glo kilns and the Pro-Fusion 16. The Orton 12-key controller is preprogrammed with good sample programs and is standard on the Pro-Fusion 26, 36, and 52 models. The Orton 12-key controller is also available as an option for the Pro-Fusion 16. All Jen-Ken controllers come with conservative pre-programmed schedules and the added flexibility of adding custom programs, up to 20 segments. You can also edit the pre-programmed schedules to suit your needs.

Clay Shelves Verses Fiber Shelves

A clay shelf is fine to use in a fiber kiln. It must be on kiln posts. For the large 24x24" clay shelf, do not put the post in the four corners. This leaves the middle unsupported. Simply move the posts from the corner location towards the middle about 4-5 ". Then the gently place the shelf on the posts. If the shelf rocks at all then then move a post a little



to see if the rocking stops. A 2"x2" fiber blanket pad on top of the posts and help level and stop rocking. The large clay shelves do not like to heat fast. Even though it is a fiber kiln the clay shelves need to be treat like is a brick kiln and heated at about 300° per hour to 400° max to 1000°F, after 1000°F the speed can be increased as needed. Kiln wash, the best side of the shelf with 5-7 thin coats of kiln wash and use firing paper on top of that.

Please Read: The Fiber shelves never get posts under them. Fiber shelves must lay flat on the floor of the kiln. These shelves get kiln wash on the best side of the shelf with 5-7 thin coats of kiln wash and always use firing paper under the glass to prevent the possibility of glass sticking to the fiber shelf if the kiln wash is thin. Cover the entire shelf surface with glass when firing. And for the first firing or two heat slower 300 per hour to get the board used to thermocycling up and down. Glass that is just in the middle of a large kiln shelf concentrates the heat in that area and the cooler areas can wing up in the corners. It is like the shelf is warping upwards where there is no glass. Fully covering the shelf with glass is recommended for all large kiln shelves. The 24x24 inch size and larger. Protect the kiln shelves as they are not covered as part of the kiln warranty.



If your kiln is a ProFusion deep, the kiln the floor is lowered and there is a small wall around the bottom. It can be difficult to get the shelf in and out. A corner or inner brick can be lifted out and replaced to help access the shelf.

Please call us to talk about any concerns about firing the kilns and the loading of them.

Relays: Relays on a kiln cycle on and off to heat the kiln at the rate per hour that has been entered into the controller, when set to full the relays stay on until the temperature is reached and when cooling at a Full setting to anneal, the relays stay off until the start the annealing temperature and then cycle on and off again. Mechanical relays have a life of a few hundred thousand clicks and then new ones are needed. Faster firings turn into less clicks and longer life for the relays. Mercury relays last about 5 million clicks and longer. The new solid-state relays should last forever (or a whole lot longer) and has mechanical relays as a back-up for almost all of our kilns. You can watch the kiln cycle on and off with the pilot lights, that should always cycle together. If one stays on, flickers, or does not come on at, please stop the firing and unplug the kiln and call us at 863-648-0585 during business hours.

Solid State Relays:

Solid state relays are great for two reasons. The first is that then should last forever as they have no moving parts, and second is that the mechanicals are still in the box as safety relays. The controllers are told that there is a solid-state relay in the mix and the controller then turns the mechanicals on at the beginning of the firing and they stay on the whole time. Then when the firing is complete, they shut off. The mechanical are back-up relays that if there was an issue during the firing they can disconnect power to the coils. Most of the time the kiln will have to heat to 100°F higher than the highest temperature in the program and then it will in a high temperature deviation situation and shut the kiln off. The solid-state relays cycle more often and have a more seamless rate of rise with AF and TAP controllers.



Firing in the Pro-Fusion Kilns:

In the 1st column of the chart below, is a common firing schedule for a brick kiln, for fusing (2) 3mm pieces of sheet glass. We are going to speed the fusing up to save time and electricity. Try the Fiber Slow Firing schedule with a 6" and 12"-piece. Next time, speed it up and use the schedule in the 3rd column of the chart, Fiber Fast Firing. The smaller the pieces are, the faster you can go.

Fusing or on 24" x24" clay shelves	Fiber Slow Firing Fusing on Fiber Shelf > 12"x12"	Fiber Fast Firing Fusing on Fiber Shelf < 12"x12"	Good ProFusion Fusing Program for Most Things
Ra1 300° per hour	Ra1 400-500° per hour	Ra1 600° per hour	Ra1 500° per hour
°F1 1200° degrees	°F1 1500° F	°F1 1500° F	°F1 1000° F
Hld1 30- 60 minutes	Hld1 10 minutes	Hld1 5 minutes	Hld1 10 minutes
Ra2 500° per hour	Ra2 Full per hour	Ra2 Full per hour	Ra2 Full or 600 per hour
°F2 1480° degrees	°F2 900° degrees	°F2 900° degrees	°F2 1500° degrees
Hld 2 20 minutes	Hld 2 30 minutes	Hld 2 30 minutes	Hld 2 10 minutes
Ra3 Full	Ra3 0000	RA3 0000	Ra3 Full
°F3 900° degrees			°F3 900° degrees
Hld3 30 to 1 hour			Hld3 minutes
Ra4 200 per hour			Ra4 0000
°F4 700 degrees			
Hld4 0			
Ra5 0000			
Annealing Temperatures shown are for Bullseye Glass.	For thicker 9mm to 12mm work add a step to cool about 200° per hour from 900° down to 500°		

***Using a rate of FULL in the first 1000 degrees of the firing is appropriate only for pieces less than 3" squared and less than 3 layers thick and on a fiber shelf. Larger pieces can go "FULL" after the first 1000 degrees, or as fast as the piece will tolerate, so run a few tests. Taking the time to conduct a few test firings will go a long way in know what your glass can and cannot do for you at these faster rates.

Annealing

Annealing is an important step of a firing schedule to reduce stress. Follow the glass manufacturer's guidelines for the length of time and appropriate temperature for your glass. On the way down, hold between 900°F-950°F for a length of time relative to the size of the pieces to help reduce internal stress. (Bullseye Glass Company's current recommended anneal temp is 900°F, while Spectrum Glass Company's recommended annealing temperature is around 950°F.) In a fiber kiln, jewelry sized pieces generally do not need to anneal. The bigger your pieces are, the longer you'll need to anneal. Your firing results will give you an indication of annealing times that will work for your size work. For larger pieces up to 16"x16" two layers, start with a 30-45 min annealing time on fiber and 1 hour on the clay shelves and then you can work your way down to shorten your schedules if you like. Annealing on a fiber shelf should be shorter than clay because the clay shelf absorbs the same amount heat as the glass and then has to cool slowly at the same rate.



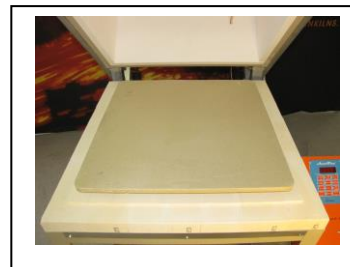
A great resource is the glass company's websites, they want you to be successful with your pieces and give firing schedules that are the best for your project. One thing that is important for everybody to know is the annealing of thick pieces. Pay close attention to these if some about you pieces make it to 1" thick then annealing properly is a must. This is for artist that cast and dam up the work.

Once the kiln shows complete turn the toggle switch to off and let cool. Then later turn the toggle back on and it will show the current temperature to indicate if the kiln is near room temperature and can be opened.

A good home test for stress in the finished glass plates and bowls: Put finished pieces in the freezer. Take them out and run HOT tap water over them. If they don't break, they are stress free for day to day use like the dishwasher! This may not work well on larger thick pieces but for smaller ones it is a good test to see how well pieces are annealed.

Fusing Thick Glass and Second Firings and Slumping Glass

Rippled glass is thick and thin over the entire surface and will need to heat slower than two or three layers of single layer glass to accommodate the glass variances. If fusing clear over ripple, then slow down and add a bubble squeeze in around 1200°F to minimize trapped air. A bubble squeeze is a hold in 1200°F range to allow the top piece to slump slowly into the bottom piece and allow the most air to escape. Glass that is 6mm thick or more will also need to fire a slower (more like 300°F -500°F or less per hour, not FULL (as fast as Possible)) on the way up. Remember, a fully fused piece of glass is now 6mm thick or more and cannot be taken as fast as the thinner assembled pieces from the first firing. You'll need to slow down for a second firing of your fused work or slumping, either into or over a mold. Try using the "Slump Program" that is in the controller under the SP mode, and speed it up from there. Also, slow down firing rates to accommodate your ceramic molds. You may need to ramp as slow as 300°F or less per hour, depending on the mold. Make sure your mold is vented with pin holes in the mold to allow air to escape.



The ProFusion's

The ProFusion's are an amazing kiln that is that it full of features integrated into the kiln from decades of kiln building. For starters the kiln is on caster so that it can me moved into location and the front ones locked. The clam shell design and the kiln floor being at table high height for the easiest loading makes for a user friendly kiln with no bending over to load down and into a kiln. The higher base was done to allow projects to be assembled in the kiln.

The floor of the ProFusion 's are brick that are not cemented together. This allows them to expand and contract without creating stress cracks over time. The bricks are fit together without mortar, to be able to be removed if needed, for example, if glass where to run off the shelf and harm them. The bricks are numbered and go in numerical order from the front left to right and then the next row from left to right work towards the back. Try and keep them snug as each brick is placed in position and on the fiber pad below. Feel free to kiln wash the floor. The seams will show as the kiln is fired and the bricks move a little.

There are two shelf options for this kiln. One is a 24 x24 clay shelf and the other is the fiber shelf. The clay shelf has to be placed on kiln posts that are in from the corners about 4-6". Make sure the shelf is level and does not rock on the posts. If it does rock a little moving the posts a few inches in any direction can help. Placing a little bit of fiber blanket



on the tops of the posts and then the placing the shelf can help. Use a level on the shelf to verify if it is level or not and make adjustments. A non level shelf can start with a sloping floor to simply a moving of a post a little. Minor differences are not a big deal, but a slope could cause glass to move downhill with a full fuse.

The fiber shelf is made from the same material as the kiln, a rigid fiber board that has been rigidized and pre-fired. This shelf must lay flat on the floor on the floor and never on posts. Make sure the brick floor is flat and smooth and lay gentle lay the board on the bricks. No Posts! Center the board and then look at all sides and slowly lower the lid to verify the walls of the kiln cannot touch the board at it comes down. The board can be coated with boron nitride or kiln wash. Follow the directions for those items. The fiber has to be protected, so apply one of the surface protecting coating before using the kiln. Then use kiln shelf paper with every firing to be the main protection of the kiln and then coating on the shelf will be the backup. With the fiber shelf in place the kiln is now an all fiber kiln on the inside.

The 38" uses a 24x24 clay and a 12x24 that make up a full layer for the clay shelves and the 52" uses 2 24x24 clay shelves. The fiber shelves are made special for each size kiln.

Plugging it in:

The ProFusion's all use a 50 amp 6-50 power cord. The 26" and 38" kiln draws 36 amps on 240 volts and the 52" draws 45 amps. A 50 amp breaker and #6 wire is sufficient to about 80 feet. Mount the receptacle to the back right of where the kiln is to be located. And install the ground of the receptacle on top (just like the picture below). Most prefer to mount the controller on the wall, rather than bending over to program the kiln. There are hangers on the controller. It is helpful to use a couple washers on the screws to hang the controller to help keep the hangers from slipping off the screws. The controller can hang on the right hand side of the frame it needed.



Washer to help hold the controller to the wall



T/C Mounted



6-50 Receptacle 240v 50a

Once the kiln is in place, lock the front casters to help hold it in place, the controller mounted to the wall and plugged in to the receptacle, turn the kiln on. It will power up and show idle in the display. The 12 button controller has 10 blank programs that are easy to add firing schedule to its memory. While this kiln is large and can fire amazing fast we need to harness the speed for the first few cycles to see how the pieces turn out and then speed it if from there. Below are a few programs to start with and then speed up as you can. If firing a giant batch of pendants or painting on glass, this kiln can cycle up and down a couple times a day when using the fiber shelf. If tile sized pieces are to be full fused, then 1 to 2 firings in a long day are possible, on the fiber shelf also, but the larger pieces will need to go up slower and come down slower with a good anneal, most use the clay shelf on posts and do a more traditional firing schedule to start.

Recapping the Set-up for the ProFusion 26 and 52:

- 1) Place the kiln in a roomy well ventilated area so that fumes and smells from binders in shelf papers can escape.
- 2) Set the kiln up at least 18 inches away from any walls (left, right and behind) or material that could get too hot and ignite.
- 3) Thermocouple: Take the set screw out of the thermocouple bracket located on the back of the kiln and slide the thermo into the hole and put the one set screw back in. This is simple to do and the set screw keeps the oval block and the thermo from sliding out. DO NOT PUT THE BLOCK BEHIND THE BRACKET!!!! There is a picture above.

- 4) Plug the kiln into a plug on a 50a circuit 208 to 240 volts. All kilns perform the best near the breaker box. If there is a long run you may need to go to a heavier wire size.
- 5) Kiln wash the floor of the kiln if desired. (Directions are provided on the pack of kiln wash that came with your kiln.) You must kiln wash or use boron nitride on the top of the shelves, do this for both the clay and the fiber shelves tops only (it is okay to do coat edges).
- 6) Turn the kiln on with the toggle switch and it should power up and show then current temperature and IDLE.
- 7) Directions for the controllers are included in a separate book for the TAP and the 12 Button controller. There are YouTube videos online and you can always call our offices for help. Jen-Ken Kilns wants you to be successful. If you need us, never hesitate to call.

High Temperature Warnings:

These fiber kilns models have a max firing temperature of 1700°F please do not operate your kiln above 1700°F or for long high-temp holds. When attempting pot melts, raking, casting, or other high-temp work, please consider appropriate firing schedules for your kilns temperature rating. While these are fast firing kilns, they were not designed to go to high temps and hold for long periods of time. The cause of these stress lines is that the kiln body is shrinking. Each kiln has been put into a kiln and pre-fired to 1800°F. We are improving the temperature ratings of our fiber kilns each year, so these issues may disappear. Fiber Patch is available to mend cracks and small damaged areas of the fiber kilns as needed. Call Jen-Ken Kilns if you planning on moving the kiln in the future to a new location. There are pointers that are given to help make a kiln travel while minimizing damage with preparation.

Firing it Up!

Directions for the controller are included separately and a quick start guide can be found below.

Never Leave a Firing Kiln Unattended!

Call if you need help, and thank you for using one of our kilns. Go and make great things.

Jen-Ken Kilns

863-648-0585 T-F 7-4 Eastern

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