



# SCHACK

**art center**

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Hot Shop Users Manual  
Version I 2011\*

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## **HOT SHOP ACCESS & RESERVATIONS**

**To access the Schack Hot Shop you must be one of the following:**

1. A student registered for a current class (allowed to use the facility during class times and on designated Open Fridays, excluding the hot shop.)
2. A Schack member working independently with an access card (allowed access during times classes are not in session.)

### **Schack Membership Level**

There are two yearly membership levels:

#### **Friend Benefits, \$50**

1. Member rates on art classes
2. Early access to class registrations
3. Invitations to exclusive member only events
4. Event invitations, updates, and class catalogs delivered to your home
5. Discounts at member partner businesses.

#### **Patron \$100**

All benefits of the Friend Level plus:

1. A 10% discount in Gallery Store
2. Reciprocal admission to NARM program.

### **Steps to Obtain your Schack Identification/Access Card**

1. Call or visit the front desk to schedule your orientation appointment
2. Complete your orientation
3. Return a week later for your test
4. Purchase your membership
5. Upon successful completion of your test and verification of your current membership status by staff, the Hot Shop Coordinator will approve your access to the equipment/studio being tested.
6. Your Schack Identification Card will be given to you at or prior to your first rental (this is the same as your membership card, but with a special studio rental sticker).
7. Studio Renters are responsible for keeping track of their cards. If lost, Schack will re-issue your first replacement card at no charge. If additional cards are lost, a \$10.00 fee will be charged for each replacement card.

### **Orientation**

The orientation provides information that will be included on the studio test. The Hot Shop Coordinator will review the safety requirements of the studio, present and review the Studio Handbook, and explain how to check in and pay for studio use. Coordinators are not instructors and do not substitute for educational training. You need to have adequate experience in the studio prior to the orientation.

### **Access Test**

You must wait at least one week after completing an orientation to take the test.\* The Hot Shop Coordinator will administer a practical test and record the results on each piece of equipment applicable. If you do not successfully pass the test you must gain more technical experience before we can grant you access to the equipment. This can be done by either taking a class or private

lesson at Schack or through outside experience. You may retake the test once you have learned how to use the equipment in the studio.

A Studio Access Test gives you access to a specific studio. You must complete a Studio Access Test for each studio that you would like to use.

To gain access to any of the Schack's studios, including the Hot Shop, you must pass an Access Test for each studio or piece of equipment that you would like to use. Schack uses Access Tests to ensure that people have a basic knowledge of how to use studio space and specialized equipment safely to avoid injury while also preventing the equipment from being damaged.

This is some of what you will need to know to gain an access card:

- Administrative policies
- Payment and financial obligations
- How to restart the furnace after a power failure
- How to turn on a glory hole
- How to operate a Watlow PM6 controller to turn an annealer up or down
- Annealer space and operation
- How to turn on the pipe warmer
- How to operate the hot plate
- Scheduling policy
- How to turn the color bar oven on and off
- Gathering control
- Clean up
- Etiquette
- How to locate and change a propane tank
- How to use the Oxy/Propane torch

*The Studio Coordinator and Glass Director are the only staff members allowed to administer Access Tests.\**

### **Expiration Date of Schack Identification/Access Card**

As long as you maintain your Friend or Patron Level Schack Membership and regularly rent the studio your access privileges do not expire. If more than six consecutive months pass without any shop time accrued in a studio to which you have been accessed you may be required to schedule a brief review of policy with the Hot Shop Coordinator. If more than two years has passed since your last rental in a studio you will need to complete the Studio Access Test again.

### **Revoking Studio Access**

Schack reserves the right to revoke your Schack Identification Card at any time. Grounds for revoking access include but are not limited to:

- Violating Schack's Code of Conduct
- Abuse of the equipment
- Activities that put other renters in danger
- Failure to pay rental fees or membership fees
- Repeated failure to check in at the front desk
- Violation of policies outlined in this handbook

If your Schack Identification Card is revoked, you will need to arrange with the Glass Director to be reinstated according to agreed upon terms. In some circumstances, reinstatement is not an option.

## Using the Studio

### Responsibilities

- Be Safe!
- Abide by Schack's code of conduct.
- Clean up when you are done using the studio and help maintain work areas
- Use tools safely and treat respectfully
- Notify Schack immediately of needed maintenance and fill out a work request form
- Make art and have fun!

## Check In

When you arrive at Schack to use our facility, first visit the front desk to check in. You will be asked to pay when you arrive and you will be given a receipt for the day. Failure to visit the desk upon the start of your studio rental time will result in a written warning. Continued failure to check in at the front desk will result in suspension of your studio privileges and an assessment of fees. See Fees Chart for Details.

## Posting Schack Identification Card

Upon checking in, post your Schack Identification Card next to the daily/weekly hot shop calendar next to your posted rental slot. This must be done before you start working.

## Waiver Agreement

Before any student, independent user, or user's assistant is permitted to use the facilities, he or she must first sign a liability waiver. Students will receive these waivers at the beginning of the first session of class. Independent users will receive waivers when their access cards are granted. Independent users are responsible for seeing that their assistants sign waivers before beginning work. Once signed, the waiver agreements will be permanently on file in the main office. Non-students must sign waiver agreements before using any equipment.

## Drugs and Alcohol

Drugs and alcohol are strictly prohibited at Schack. If you use these substances before or during your time at Schack you will lose your access card and be asked to leave.

## Scheduling Hot Shop Blow Slots

You may reserve a 4-hour blow slot online at [schack.org](http://schack.org) or by calling 425-259-5050 x. 22

### ***To reserve a studio online at [schack.org](http://schack.org):***

- Go to [schack.org](http://schack.org)
- Click the "Studios" link in the orange navigation bar and then "Reserve a Studio" in the grey sub-navigation bar
- Select the studio you would like to reserve (NOTE: ONLY THE HOT SHOP MAY BE RESERVED ONLINE, CALL 425-259-5050 TO RESERVE THE FLAME & KILN STUDIO)
- Scroll through the weeks/days/months in the calendar using the arrows at the top of the calendar. Available blow slots/glory holes appear in orange.
- Select the slot you would like to reserve and then login (or create a login) and complete the checkout to finish reserving the selected blow slot.
- You will be sent a confirmation email when you have finished your reservation.

You cannot reserve a slot before you have an access card. Our on-line system has a list of all access card holders and will not allow you to schedule time if you are not on the list. If you anticipate earning an access card and want to schedule a slot, talk with the Hot Shop Coordinator or Glass Director to make an exception.

### **Blow Slot Cancellations**

Any blow slot that has been scheduled in advance, and is canceled at least 48 hours before it begins, will be made available for other users. The previously scheduled renter will not have to pay the rental fee. **People who cancel their slot less than 24 hours prior to the beginning of the slot will be charged a \$50 cancellation fee. If you do not cancel your slot at least one hour before it starts, you'll be charged for the entire cost of the blowslot.**

### **Payment**

When reserving your hot shop blow slot you **MUST** provide a credit card to pay your \$10 non-refundable deposit and secure your reservation. **Final payment will be charged to this same card on the day of your scheduled blow slot.**

If you prefer to use a different credit card, check, or cash please inform the Hot Shop Coordinator or Glass Director when you arrive for your blow slot. Alternate payment methods must be received on the same day that you use the studio, otherwise your credit card on file will be charged.

Current rental rates are available by visiting [www.schack.org](http://www.schack.org) and navigating the studio menus.

### **Other Fees Assessed**

#### Late Payment Fees

Repeat late payments are subject to a \$30 late payment fee for each studio session.

#### Hourly Rental – Late Check Out Fees

Failure to visit the front desk upon the start of your studio rental time or at the end of your rental time (hourly only) will result in a written warning. The second failure to check in will result in suspension of your studio privileges and assessment of fees.

#### Clean-up Fees

Renters who fail to clean the studios upon leaving will be first given a written warning. The second failure to clean the studios will be subject to a \$50 clean-up fee will be assessed.

#### Blow slot Cancellation Fee

You can cancel your blowslot up until 24 hours before it starts. If you cancel fewer than 24 hours before it starts, you'll be charged a \$50 cancellation fee. If you do not cancel your slot at least one hour before it starts, you are responsible for the entire cost of the blowslot.

If you have questions about your payment, please contact the Hot Shop Coordinator at [hotshop@schack.org](mailto:hotshop@schack.org).

### **Assistants**

All assistants must sign a liability waiver. Assistants do not need a full access card; however, the persons they are assisting must have this card. It is the responsibility of the person hiring an

assistant to make sure that assistant has signed a liability waiver and understands the policies and procedures of the Glass Studios at Schack. Your assistant should be able to make a punty, open and close the furnace and glory hole doors, understand gases and torches and to know the glass studio etiquette as described on page 13. If you continue to work with the same assistant, he or she is encouraged to become accessed for the studio.

### **Accidents and Incidents**

Incident forms are available inside of First Aid boxes located throughout Schack. Use incident forms to report abuse to the facilities, as well as all injuries, including minor burns and cuts.

### **Defective Equipment**

Work Request Forms are available outside of the Glass Office. Please complete the form and place it upright in the box, next to the blank forms. **Any problems with the equipment must be reported with a WORK REQUEST FORM.** The tech has too many responsibilities to remember each request without the form. Use the form to report the following:

- Broken or damaged equipment
- Useful comments and suggestions
- Difficulties with other renters or students

### **Damaged Equipment**

Damage to equipment is an expected event in a learning environment. We expect it to happen, and our only concern is to repair it as expeditiously as possible. If you damage equipment, please notify a technician immediately. If “user error” has played a part, the technician may review the safe operation of the equipment with you. Failure to notify Schack when you damage equipment only serves to delay prompt repair and cause inconvenience to other users.

## **HOT SHOP RULES & PROCEDURES**

### **Rules and Procedures When Using Blow Slots**

All blow slots include glass, annealer space, use of bench and MAPP gas torches and a limited assortment of hand-tools. Access to specialized equipment (hot plate, hot torch, leaf vacuum, etc.) is on an “as available” basis. The amount of glass you are allowed to draw from the furnace may be monitored by the Glass Technician. You should be aware of the amount of glass in the furnace before you begin and be considerate of the people who will be following you. If you plan to draw a large amount of glass out of the furnace, you must notify the Glass Technician at least one week before your slot.

*Gaffer:* The gaffer is the person signed up for the blow slot. A blow slot can be split between two people, but one person is responsible for the slot. His or her name is entered on the slot schedule. While it is okay to split a slot (sharing the same bench and glory hole), it is unacceptable to have multiple gaffers working at the same time.

*Preparation Time:* Plan to arrive up to an hour ahead of your scheduled slot to light your glory hole, add color to the color oven, light the garage or warming plate, and obtain the hand tools you may require. It is up to you to make sure the shop is ready for **your own** blow slot. You must sign in at the front desk, pay for your slot, and get the key to the tool chest.

*Annealer Space:* The amount of annealer space is limited. Each blower is allowed to take up one third of annealer space. If you plan to use more than this, you must arrange with the person whose annealer space you will be using, or plan to rent one of the two additional annealers.

*Hand Tools:* Schack provides an assortment of hand tools including: straight shears, diamond shears, jacks, tweezers, as well as wooden blocks and paddles, blow pipes, and punty rods. All Schack tools have 'Schack' engraved or marked on them. In addition, Schack provides gloves, glasses, wax, and some specialty tools. All hand tools for the different benches are kept in tool boxes in a designated box in the hot shop. The keys are kept behind the front desk and are available for renters upon sign-in and payment.

*Specialty Tools and Materials:* If you are interested in bringing in tools or equipment (other than hand tools or harmless tools), which could cause a problem for other users or pose potential safety risks, you must contact the Glass Technician a minimum of 3 days before you plan to bring in such tools.

### **MORNING SLOT RESPONSIBILITIES – START UP SLOT**

- Slot time: 9:00 a.m.-1:00 p.m.
- Do not run over time.
- Check the temperature of the AF36 (or any annealer) before opening it.
- Check inside the AF36 and put any work you find there on the glass pickup shelves.
- Turn on annealer.
- Turn on the color bar oven (if needed).
- Turn on your glory hole.
- Turn on the pipe warmer when you turn on the glory hole.
- Take out glass trash in glass buckets.
- Dump glass in strip off buckets into the dumpster.

- Fill the wet strip off bucket 1/2 full of water. Dry bucket should be empty.
- Check the temperature of annealer before opening it.
- Crack open annealer.
- Turn down morning annealer by 2:00 p.m.
- Do a general clean up of all spaces you have used. Clean up starts 15 minutes before the beginning of the next slot.

### **AFTERNOON SLOT RESPONSIBILITIES – ANNEALER SLOT**

- Slot time: 1:15-5:15 p.m.
- Do not run over time.
- Check morning annealer to be sure it was turned down. If not, turn it down by pushing the EZ button on the Watlow controller.
- Check the temperature of the other annealers.
- Unlock and crack the door on annealers when the temp is below 200 degrees, then unload and turn on annealer.
- Turn off unused glory holes.
- When your slot is over, do a general clean up of all spaces you have used.
- Turn down annealer #2 after the slot.
- If there are no evening blowers clean up as if you are the evening blowers.

### **EVENING SLOT RESPONSIBILITIES – CLEAN UP SLOT**

- Slot time: 6:00-10:00 p.m.
- Do not run over time.
- Use annealer AF36, for the evening slot.
- Unload and turn on AF36.
- Turn off unused glory holes, color oven, pipe warmer and powder box
- Sweep and hose down the entire hot shop. Move **ALL** equipment out of the way to clean properly. Sweep in and around annealers and the equipment under the hood. Hose down the front half of the shop making sure to get in all the cracks. Use the squeegees to push the water towards the drain in the middle of the shop.
- Return all the equipment to its proper location.
- Put away all tools.
- Turn down Annealer AF36.
- Make sure all annealers have been turned down.
- Make sure that the charger is in the building before you leave. **This is extremely important.** If for some reason the charger does not show up, there may be no glass or classes the following day and the building will not be secured. The chargers' phone numbers and schedule is posted on the glass information board (bulletin board on north end of glass shelves); so give them a call. If you cannot reach the charger page the on-call Technician.

### **Clean Up Procedures for All Blow Slots**

- Note condition of slot before you begin. If the previous user has not cleaned up, please ask them to. If they have already left and you are unable to contact them, report this on a Work Request form immediately and a member of the staff will contact the previous user.
- You should only have to clean up in your space, but **the entire shop must be clean at the end of your slot.** Put away the color chopper in the batch room and sweep up any glass shards left over.

- At the end of your slot you must sweep the floor, which includes the area around the benches, around and beneath the glory holes, beneath the annealer, and beneath the furnace door. Floor clean up is done with a broom and sweeping compound, which is located behind the hood. **Do not use the brooms on the benches!** Move all equipment forward and sweep (with compound) to the front. Next move all the equipment (yolks, tracks, marvers, benches, shields, buckets) back to the annealers and finish sweeping.
- Clean up the powder box, removing all glass powder in and around the powder box. Use a wet paper towel and wipe out the inside thoroughly. Store all bowls and sheets on the bottom shelf.
- The evening slot should hose down the floor to clean up remaining dirt. Do not allow water to go under the annealers. Use the squeegee and brooms to push water toward the floor drain.
- Shut off your glory hole unless you are sure there is a slot scheduled after you.
- If you are the last person using the glass shop after your slot, turn off all glory holes and pipe warmer.
- Turn off hot plate, coil up rubber gas hose, and return to batch room.
- Clean up around and beneath all annealers you have been using.
- Replace all tools to their proper location.
- Newspaper in trash.
- Morning, afternoon, and evening slots must make sure the annealer they were using is turned down by pushing the EZ button.
- To keep the annealer on schedule, only use the one designated for your slot (Morning #1, Afternoon #2 and Evening #3) and turn it down after the slot.

### Correct Location of Various Tools

- All tools must be returned to their proper location.
- Blow pipes and punties belong in the rolling pipe rack, located under the hood.
- All wood tools belong in the proper location on the tool rack. Blocks **must** be kept underwater past their neck joint. Large blocks go in the big bucket past their neck joint. Paddles go in the dry paddle box.
- All Schack hand tools belong locked back in their assigned boxes and should be returned to the shelf at the end of the slot.
- Specialized equipment, such as the foil box, air hoses, color chopper, and optic molds belong in the equipment shelves located behind the hood.
- Do not leave Schack blowpipes soaking in the wet drop off bucket.

### Glass Pickup Shelves

All pieces taken from the annealer should be moved to the pickup shelves. Every two to three days the pieces on the pickup shelf will be dated with a permanent marker pen. **Work that has a date more than 14 days old will be thrown away.** You should make an effort to remove your work the day after you blow, especially if you have large pieces. Please bring your own packing material to transport pieces home, especially if you have a lot of work or if the work is large.

## HOT SHOP SAFETY

### Power Outage Procedure

1. Shut off gas valves on all three glory holes, pipe warmer and any other equipment hooked up to gas lines i.e., garage, hot plate etc.
2. If power does not return within 10 minutes, tell the Charger or call him if he is not in-house. Our security monitoring company, will automatically call the Charger when an outage is detected. Then, wait for power to return.
3. When power comes back on, locate the reset button on the front of the grey furnace controller box and push it. Listen for the blower motor coming up to speed. The furnace should relight within one minute. If it does not, repeat the steps. If it still does not relight call or page the Glass Technician immediately.
4. Only after the furnace has restarted, relight the glory holes and pipe warmer.
5. Do not begin to blow, or open the furnace door, until it has recovered temperature.

### Gas Leaks

If you smell a gas leak, first shut off all auxiliary that has gas running to it. It is not necessary to shut off the furnace or the gloryholes if they are still firing normally because the active flame will consume any stray vapors. Most times the leak is coming from the torches. If you cannot find or stop the leak, contact the Glass Technician immediately.

### First Aid

Report all accidents, large or small, by filling out an incident report form located inside of the first aid box door. The first aid box is located on the wall near the stereo units. **Notify a staff person of your injury IMMEDIATELY.** This is very important. In the event of a minor burn, immediately run cold water on the affected area for a **full 20 minutes**, then use a burn cream or aloe and bandage. In the event of a more serious burn, we have an emergency shower located on the column near the corner glory hole. If you have a more serious burn or other injury, you should either call an ambulance or be driven directly to an emergency room. The nearest hospital is Providence, located between 18th and 16th on Jefferson, six blocks north of Schack. The best route is to turn left out of the parking lot, go east on main to 20th and turn left, go north on 20th to Jefferson, turn left and go to 18th.

### Equipment Failure

*If glory holes shut down along with furnace:* There has probably been a very short power outage. Follow power outage procedures outlined above and on the side of the furnace control box.

*If furnace goes down and glory holes remain on:* Stop blowing immediately and keep the furnace door closed. Call the on-call/charger phone and wait for a call back.

*If furnace goes to high fire during a blow slot:* Check to see if someone has done something to the furnace controller. If temperature is not within 30° of 2100° (for blowing), call the charger. Otherwise, wait for five minutes to see if furnace stabilizes at a lower output.

*If furnace door falls apart:* Try to see if part of the door has fallen into the tank. If it has, you should make every attempt to remove it by using a ladle or the scraper. Call Glass Technician immediately.

*Glory holes:* If glory hole shuts off during your slot you have probably experienced a power failure. If a piece of a glory hole comes loose during your slot, please save the pieces. Using a glove put the

pieces on top of the glory hole. If the glory hole burner begins to make a loud popping noise, it is experiencing pre-ignition, or “back burning”; the combustion is happening in the pipe, before the burner. **Immediately shut the gas valve off and wait for the burner pipe to cool.** Try to re-light, but with more air. If it still makes a loud noise, shut it off and call the Glass Technician.

Annealers: Please check annealer before loading for loose/dangling elements. If two elements are touching they will burn out and the annealer, instead of coming up to temperature, will remain at a low temperature for many hours.

If the annealer is not coming up to the desired temperature quickly enough there is nothing that can be done to hurry it up. You may look inside to see if all elements are bright orange, and note any that are not to report to the Glass Technician. You should either be prepared to wait for a few hours, or abandon your firing and call the Glass Technician. Never attempt to insert a propane torch into an electric annealer to speed it up.

### **Other Safety Precautions**

Eye Protection: **You are required to wear eye protection.** The furnace and glory holes emit both infrared and ultra-violet light, which can cause profound eye damage. While short exposure to the unshielded eye will not cause permanent damage, prolonged exposure will. Dark sunglasses will reduce exposure to ultra-violet light to some extent; however to maximize your protection you should obtain a pair of #2.5 welding glasses or safety glasses that are rated for 99.9% UV protection. Didymium lenses provide protection against infrared emissions (thus reducing “sodium flare”) **but offer no protection against UV light.** When gloryholes are extremely bright, didymium lenses are not enough—you need additional UV protection. It is advisable to wear glasses that have side shields that protect against reflected light and exploding un-annealed shards.

Clean Air: Due to the toxicity of various chemicals used in the hot shop, certain procedures should be followed:

- Use sweeping compound when you dry sweep, and wear a dust mask or respirator with purple filter.
- All powders must be used in the powder box and never on the marver or a rolling table.
- Fuming is not allowed under any circumstance.
- No smoking in the building.

Heat: Remember, you probably can't see heat. Marvers can become intensely hot and they make extremely bad chairs. All metal surfaces should be assumed to be hot. Most metal objects in the hot shop either are, or may become, hot. Socks and various other clothing materials may protect you from heat. Use cotton and not a synthetic material for light clothing. Many synthetic materials melt upon contact with heat. Schack provides a limited number of heat resistant Kevlar gloves and personal protection equipment (some are available at Olympic Color Rod, see page **Error! Bookmark not defined.**) commonly used for loading the annealers and various other hot tasks.

Blowpipes and Water: Please read and continue to refer to “Pipe and Puntty Maintenance,” from Spiral Arts. Always put your thumb over the mouthpiece of the pipe when you dip it into water, then blow quickly through the mouthpiece after you remove it from the water. If you fail to plug the mouthpiece with your thumb, when the water comes into contact with the hot metal, it will create rapidly expanding steam which can force extremely hot water up the blow pipe making the pipe hot enough to burn you instantly. If this happens, wear gloves to remove the pipe from the water, and do not blow into the pipe; use a compressed air hose to clean the water out of the pipe. Put the pipe aside and allow it to cool down.

*Sharp Glass:* Do not leave broken work on glass pickup shelves where other people can cut themselves.

*Fire Extinguishers:* A fire extinguisher is located on the structural column as you enter the blowing area, and another one is located in the lounge area on the west wall. In case of fire, use the extinguisher, but be sure to inform the Glass Technician so that it can be serviced for future use.

## GLASS SHOP ETIQUETTE

Gathering: When you gather from the furnace, you should always turn to your right as you are leaving. When you are approaching the furnace you should stand behind and to the left of the person taking a gather.

Blowing Area: Please stay behind the yellow line, outside the blowing area, when visiting the studio or watching other blowers.

Team Size: The hot shop can comfortably accommodate teams of one gaffer and two assistants. More than three people per bench will create a strain on the space as well as others working in the hot shop. To avoid conflicts teams of more than three people should rent an additional slot during the same period. The person with his or her name on the slot is responsible for payment of the slot and to insure that his or her team does not impede others working in the hot shop.

Don't talk to the blowers unnecessarily. Glassblowing requires concentration. Be respectful when watching someone at work. Don't assist unless you are specifically asked. Wait to ask any questions until after the piece is finished and put in the annealer.

Music: Music selection and volume must be acceptable to other Schack users. Music volume should be at a level that allows users to communicate with their assistants.

Talk to the other blowers working next to you. Make sure you know what the other workers are making and how you will need to load the annealer. Let them know when you intend to cross behind them or in front of their bench.

Keep your area clean. Keep your pipes in the pipe warmer and not cluttered in the buckets. Make sure you pick up any unsafe (i.e. broken or unannealed) glass from the floor before it explodes. Do not leave furnace drippings on the floor.

Disagreements with your assistant: If you are having problems with an assistant, work them out somewhere else. Remember that Schack is a shared workspace and your tensions will be extremely disruptive and affect other users. Violent outbursts, which cause other users to complain, will result in the loss of your access card.

Clean up. **You must begin clean-up 15 minutes before the beginning of the next slot.** You must thoroughly clean up and must never expect someone else to clean up for you. Failure to clean up and/or run over into the next slot has an effect on everyone.

Other people's tools: If you need a tool that Schack doesn't have, consider it unacceptable to borrow someone else's equipment.

Annealer space: You are allowed one third of the annealer space. Please pack your work so you won't take up more than your allotted space. If you are putting special props or glass for pick-up or overlay in the annealer, you should unload them the next day. For special situations, that may affect other users, please make them aware of oven contents and process (i.e. graal pick-up with enamels). The morning annealer is unloaded at approximately 9:00 a.m., the afternoon annealer is unloaded between 1:30 and 2:00 p.m., and the evening annealer is unloaded by 5:00 p.m.

## HOT GLASS EQUIPMENT GUIDE

### ANNEALERS

Schack's hot glass shop has three annealing ovens. The large annealer is for rentals, and the double front-loading annealers at the north end of the shop are for classes and rentals. The other two annealers can be reserved by users who need a special annealing cycle, more annealer space, or as a pickup oven. The following is a guide to using any one of the annealers.

#### Designated Annealers:

Morning - #1, Top South annealer.

Afternoon - #2, Bottom South Annealer.

Evening - #3, Large North Annealer.

Loading: Load the annealer by using insulated Kevlar gloves to place the piece inside. Be careful not to lean work against other work or against the electrical elements of the annealer. Caution should be taken when breaking work off, directly into the annealer to avoid electrical shock and/or damaging others' work.

Unloading the Annealer: Be sure that you don't open an annealer **before the temperature is at or below 200°**. Opening a hot annealer will destroy the work inside. **Annealer #3 must be unlocked before #2 is turned on. If #3 is not unlocked first it will heat up past a safe unloading temperature.** If you unload paperweights or pieces thicker than 1/2", they should be wrapped in newspaper before they go onto the shelf. Pieces too hot to touch and handle comfortably also need to be wrapped in newspaper. After all glass pieces have been removed, remove all bricks and kiln furniture and place them in the designated storage location.

Fiber Products (i.e. fiber frax): All fiber products brought into Schack should be in a sealed container or plastic bag. You should only use fiber products in the glass department and for the agreed upon activity. Do not leave fiber products in the trash cans or in the annealers. If you put fiber products into an annealer you must be the one to take it out. Fiber products that are left in an annealer or on the pickup shelves will immediately become the property of Schack and at the discretion of the technician and coordinator, the responsible users may be prohibited from further usage of any fiber products.

## WATLOW CONTROLLERS FOR HOT SHOP ANNEALERS

The “UPPER” display in idle mode (outside of any menu) reads the actual temperature of the process control thermocouple. When you are adjusting a setting or valve in the controller this is where you will see the valve change.

The “LOWER” display in the idle mode reads your set point. By adjusting this (up and down keys), the controller will attempt to achieve a new temperature.

These red numbers to the right prompt you as to which outputs are running.

The little red mountain to the right will be lit when a program is running.

The next key is the “Reset” button, which can step you back one prompt (each time you press it) when you are navigating through the controller.

The “up” and “down” arrow buttons help you navigate through menus. If you press both simultaneously for 3 seconds you will enter the operations page and 6 seconds will enter you into the setup page.

The “advance” button is the green recycle key, that if pressed once enters you into the home page and if pressed in any other menus acts as an enter key. If the advance key is held down for 3 seconds it will enter you into the profile configuration menu.

Your Controller has one function key (EZ1) preprogrammed in the face of the controller by Wet Dog Glass to simplify your control process.

- EZ1 starts and stops profile 1



Watlow PM6 Face Plate

The Zone Indicator is located in the bottom left corner of the Watlow display. This prompt for RUI's indicates which piece of equipment you are configuring and on the PM controllers it indicates what the PM's address is if connected to an RUI.

## GENERAL PROCEDURE FOR TURNING ON ANNEALING OVENS

Now that we have a basic understanding the buttons' functions located in the face of the controller we can move onto powering up the system. First we turn the "OFF ON" switch located on the top of the panel to the "ON" position. You will hear a click and the "Controller Enabled" light will come on. You will then see in the upper display of the controller the actual temperature and in the lower you will see "off." This means that the system is not trying to allow power to the oven

There are three possible control modes to set the controller to, AUTO, MAN (manual) & OFF. You will begin changing the control mode from "off" to "AUTO" by pressing the advance key a couple of times until you see:

off	Control mode status – presently "off"
C.M1	Control Mode

By pressing the up key you will change the upper display to "AUTO." This will immediately change the control mode. You will then press the reset button to return to the action display, with the actual temperature in the upper display and the set point in the lower display.

Now the controller has been configured to the "AUTO" position and you can proceed with using this system. Use the up arrow to change the set point to 920. The Annealer will now come up to temperature and hold.

**DIRECTORY OF EQUIPMENT FOR MAIN CONTROLLER**

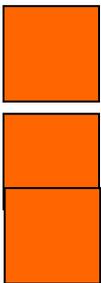
**1** GH 24 (Large Glory Hole)

**2** Day Tank

**3** Middle Glory Hole

**4** Color Box

**5** Window Glory Hole

**FURNACE**

The glass furnace should require little or no attention from the average user. The main item to be aware of is the furnace door. Never slam the door on the furnace. If you feel that the door is in trouble, please record the appropriate information on a “Work Request Form” and turn it in to the Glass Director. If the furnace door is stuck with dripped glass, try to find the Coordinator or Technician to free it. If no one is available GENTLY and very slowly pry the door up from the bottom, pressing against the sill plate and at the same time having your assistant pull the door gently and slowly to the left. Leave the door open for a moment to let the glass cool. Gently but firmly knock the glass off so the door does not stick again.

### Watlow Controllers For Glory Holes

The “UPPER” display in idle mode (outside of any menu) reads the actual temperature of the process control thermocouple. When you are adjusting a setting or valve in the controller this is where you will see the valve change.

The “LOWER” display in the idle mode reads your set point. By adjusting this (up and down keys), the controller will attempt to achieve a new temperature.

These red numbers to the right prompt you as to which outputs are running.

The little red mountain indicates that a profile is running. This does not apply to glory holes.

The next key is the “Reset” button, which can step you back one prompt (each time you press it) when you are navigating through the controller.

The “up” and “down” arrow buttons help you navigate through menus. If you press both simultaneously for 3 seconds you will enter the operations page and 6 seconds will enter you into the setup page.

The “advance” button is the green recycle key, that if pressed once enters you into the home page and if pressed in any other menus acts as an enter key. If the advance key is held down for 3 seconds it will enter you into the profile configuration menu.

EZ toggles between “auto” mode (controlling by temperature set point) & “manual” mode (directly controlling the speed of the blower with a percentage).



Watlow PM6 & RUI Face Plate

The Zone Indicator is located in the bottom left corner of the Watlow display. This prompt for RUI’s indicates which piece of equipment you are configuring and on the PM controllers it indicates what the PM’s address is if connected to an RUI.

## **Flame Safety & Ignition Operation**

**Ignition** - Before starting, make sure the black reset button on the Eclipse Veri-Flame is in the out position. This should always remain in this position.

1. Adjust the manual controller setting to 40% (or the setting that reliably allows the glory hole to light).
2. Make sure the manual gas cock upstream of the mixer is closed.
3. Open the two smallest glory hole doors.
4. Insert the ignited tip of a MAPP gas torch into the pilot hole beneath the front burner.
5. Open the manual gas cock. You'll hear a click when the valves open, and you'll see the visual indicators in the bottom of the valves turn from white to red. **Do not attempt to insert the torch flame after the safety shutoff valves open as gas that has accumulated can cause an explosion! Once the safety shutoff valves open, gas will be flowing, and your pilot flame should ignite the front burner.**
6. The front burner should light off immediately, and the rear burner should light off within several seconds.
7. Once the glory hole is lit, switch the controller to Auto mode and set the set point at your desired operating temperature. The glory hole will heat up to blowing temperature within approximately 60 minutes after it is turned up. Operating temperature is slightly cooler than the temperature of the furnace, so obtaining and maintaining an orange-yellow glow in the glory hole will be the objective. After some use, you will become familiar with the controller settings that work best for the glory hole.

## **Shut Down**

1. Press the EZ Key to switch from "AUTO" to "MAN."
2. Turn off the control panel.
3. Turn off the manual gas cock nearest the glory hole mixer.

When you are finished using the glory hole and ready to power down, press the EZ Key to toggle the control mode from "AUTO" to "MAN." Manual mode will prompt you with a blower percentage, set the manual output percentage to 5-15%. After setting to manual the controller is ready to turn to the "OFF" position with the red lever switch. When you set the controller to manual for ignition you will find that the glory hole is much easier to start and you shouldn't have to adjust the Eclipse low pressure mixer's gas needle valve at all.

## **Color Bar Oven**

The color bar oven is used to heat color bar prior to its being reheated in a glory hole.

- You are allotted 1/3 of the space in the oven.
- If you need more room you should make arrangements with other blowers at the beginning of the slot.
- In the morning there will probably be color in the oven from the previous day. You should remove the color and put it in the pan located below the oven. Color in the color oven always belongs to somebody. **Please do not take color which is not yours.** Suggestion: in order to make identification easy, some people engrave their names on their color bars.
- Turn the color oven on at the beginning of your slot if it is not already on. The temperature should be set at 950° and you should not need to change it.

- Load color onto the angle irons remembering that the oven is hotter at the bottom than the top. Cold color can be loaded when the box is hot by placing color on a cooled tray at the top of the box and by dipping it in water before exposing it to the heat.

### **Hand Tools**

- Hand tools are available for each bench with no extra cost to the renter. Each set is kept within a locked tool box located in the hot shop. The keys are kept behind the front desk.
- Do not get wax on tweezers and shears. If you do, clean them off by pinching, cutting and/or wiping the tool through a fresh gather of glass.
- Do not use shears as hammers.
- Report all damaged tools to the Glass Technician by filling out and turning in a "Work Request Form."
- Blocks and paddles must be immersed in clean water at all times.

### **Pipe Cooler**

- If the water in the barrel is extremely dirty, it should be changed.
- Make sure to turn the switch, located in the base of the pipe cooler to "on" or else it will not function when you step on the pedal.

### **PIPE WARMER**

#### **Lighting the Pipe Warmer**

- Open the ball valve to let gas flow to the pilot safety valve. With a MAPP flame under the pilot burner, push down on the black knob of the pilot safety valve and hold it down for 15 seconds after the burner ignites.
- Turn the black knob counterclockwise and the main burner should ignite.
- To turn off, simply turn the black knob clockwise until the main burner shuts off, but the pilot valve stays on. You can either leave the pilot on or turn it off by shutting the main gas ball valve.
- Do not place pipes or punties with large amounts of cold glass still on them into the pipe warmer.
- Avoid letting pipes get red hot inside the pipe warmer. Pipes and punties should never be placed directly into the flame. Rather, place them just in front of the flame for optimal heating. Refer to "Pipe and Maintenance Guide," from Spiral Arts.

### **Garage**

- Open the ball valve to let gas flow to the pilot safety valve. With a MAPP flame under the pilot burner, push down on the black knob of the pilot safety valve and hold it down for 15 seconds after the burner ignites.
- Turn the black knob counterclockwise and the main burner should ignite.
- Garage Temperature should be between 925 and 1000 degrees.
- To turn off, simply turn the black knob clockwise until the main burner shuts off, but the pilot valve stays on. You can either leave the pilot on or turn it off by shutting the main gas ball valve.

*If you have any questions or problems, please ask!!!!*

*\*Much of this manual was re-printed from Pratt Fine Arts center's glass user's manual. Thank you!*