

GLASSIPEDIA

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A

AIR, AMBIENT/ATMOSPHERIC: (Tool) Ambient room-air is used by glass artists to expand and help shape the glass object from the inside. Blowing air into the glass piece via tubes or pipes is common. The finished product may even trap the air inside of the object (e.g. a glass ball) trapping the very breath of the artist in the glass vessel forever. Often the air is passed by the assistant to the artist blowing into the “blowpipe” at the bench while the “gaffer” shapes the object, but it is also common to see a hose extension from the mouth of the artist to the end of pipe be used to push the air into the piece.

AIR, COMPRESSED: (Tool) Most glass studios use high pressure (e.g. 120 psi) air for running tools (e.g. sand blaster) and operations (e.g. opening heavy doors) but low pressure (e.g. 5 psi) air can be used at the bench as well. Low pressure compressed air is used with the puffer or to cool the glass. The compressed air is usually created by a central air compressor.

AIR COMPRESSOR: (Equipment) This is a motor driven device that compresses atmospheric air, stores the compressed air and distributes air for use in tools and operations. The compressor is commonly electric and uses pistons, diaphragms and/or rotary pumps to increase the pressure. Most compressors have a storage tank. Distribution of the air is often by reinforced rubber tubing with "quick release" connection. Many tools are high pressure devices (e.g. 125 psi).

AIR GUN/NOZZLE: (Tool) A device with a trigger for releasing compressed air from the air hose. Usually large amounts of air are released and used to cooling selective parts of the glass object being made or used to cool the hot cane before it becomes too thin. It is also used in a sand-blaster to direct the flow of the sand.

AIR HOSE: (Tool) The air hose is commonly used to convey the air from the compressor to the air gun. The air is used to cool down selective parts of a glass object which is being made or used to cool the hot cane before it becomes too thin.

ALUMINUM PUFFER (SEE SOFFIETTA)

AMPHORA: (Item) An amphora is a jar dating as early as the Neolithic Period (the "New Stone Age"; 10,200 BC to 2,000 BC). It often has two handles but not always, it typically had a "waisted bottom" and was used to transport/store a variety of liquid and dry products. Typically an amphora have long narrow necks for pouring by holding the bottom of the vessel and one of the two expansive handles joining the shoulder of the body and the neck. There are two main types of amphorae: neck amphora (neck and body meet at a sharp angle) and one-piece amphora (neck and body make a continuous curve). Initially the bottom usually has a pointed base to allow upright embedding into soft ground or sand. Later a flat bottom was incorporated into some amphora.

ANCIENT GLASS: (Term) Ancient Glass is a non-descript term referring to glass made prior to the Venetian/Murano era of glass making. The Venetian era of glass making began when some artists fled Constantinople in 1204 during its sacking during the 4th Crusade. One of the oldest glass companies is Barovier and Toso which was founded in 1295 in Murano.

ANGLEO-VENETIAN GLASS (SEE OVERSHOT GLASS)

ANNEAL: (Process) The process of slowly cooling the glass to avoid stress/strain in the glass itself. Without proper annealing stress points in the glass will form when it reaches room temperature and these stress points are easily fractured or even spontaneously break. Typically the annealing requires hours and is done over night, however, the thicker the work the longer the annealing time. The critical changes in temperature are cooling from 1000 to 800 °F.

ANNEALER (ANNEALING OVEN, LEAR, LEER, LEHR): (Equipment) A large oven that is used to gradually cool the molten glass from approximately 900 °F to room temperature. There are two basic types of annealers: front-loading and top-loading. Often the annealer is electrically empowered and computer controlled. A special type of

annealer is the LEHR. Typically a lehr has very high heat at one end (the end in which the glass object is initially placed) and a conveyer belt sl-o-o-o-wly moves the piece to the other end in which it is at room temperature.

ANNEALING OVEN (SEE ANNEALER)

ANTIQUÉ GLASS: (Term) A glass-trade term for any piece of glass more than 25 years old. Although in the antique-trade world, an item typically has to be greater than 100 years old to be considered an "antique". (See "**Vintage Glass**" for a definition of Vintage vs Antique Glass)

ASH: (Term) The name of the future HGA shop cat. Alternative names being considered are "Soot" and "Carbon".

ASSISTANT: (Person) This is the glassworker who directly assists the gaffer. Sometimes there are several assistants. The level of expertise does not dictate if the person is an assistant or the gaffer but rather the functions they are performing. Sometimes there is more than one assistant. For instance, there may be a team of four or more people assisting. **SEE POLE TURNER** as an example.

AVENTURINE GLASS (GOLDSTONE, GREENSTONE): (Item) Aventurine glass sparkles due to small/tiny specks of metal embedded in the glass. Goldstone (Gold Aventurine) has copper inclusions and Green Goldstone (Greenstone; Green Aventurine) has chromium inclusions.

AVOLIO: (Item) An hourglass shaped connecting piece seen in Venetian style goblets. It offers a thin spot to use a fork to load the goblet into the annealer but more importantly it adds a visual element to the goblet. It is like a "break" or "spacer" in the goblet.

B

BAR (SEE ROD)

BATCH (POWER): (Item) The batch is the mixture of raw materials (commonly silica, soda, potash and lime) that is melted in the furnace to make glass. It often comes in a powder which can be dangerous to breathe. Batch can either be hand mixed or bought pre-mixed. Melting batch requires higher temperature, takes more energy, longer time and is commonly more expensive than melting cullet (**See Cullet**).

BATCH TROUGH (SEE TROUGH)

BATTLEDORE: (Tool) A wooden paddle used to flatten portions of a bottle as it is being hand blown.

BEACH GLASS (SEE SEA GLASS)

BEEES WAX (SEE WAX)

BELL KILN: (Equipment) The "Bell Kiln" is a glass fusing kiln which hangs upside down (i.e. the part that opens is facing down [like a bell]). This allows access to a flat surface while maintaining the heat of the object. This kiln opens like a door or lid and does not retain the heat as well (remember heat rises). The kiln box is counterweighted so that it moves smoothly and efficiently.

BENCH (CHAIR): (Item) The bench is where the gaffer shapes the molten glass to make the glass object. It usually consists of two parallel arms which are used to support the blowpipe. Depending, in part, upon the location of the accessories (e.g. leg protector, table with tools, arm lengths, etc) it can be set up as a left-hand or right-hand bench. This single piece of equipment is the center of all the activity during the making of glass art. The gaffer often sits close to the arm of the bench (making him/her as close as possible to the glass). The arms are used to roll the blowpipe and keep it in constant motion. Shields are often present below the bench's arm to protect the gaffer leg. Often a table is part of the bench. This table holds tools, wet newspaper, wax and other needed items. Since sliding tools (e.g. jacks) need to be waxed and gripping tools (e.g. tweezers) are not waxed, placement of the tools is important. Waxed tools are typically placed with tips to one edge and non-waxed tools are placed with tips to another edge. Variations in the "Bench" include one in which the gaffer stands rather than sits or one in which the arms are replaced with ball bearing rollers (Bench Rollers). The dimensions of the bench are often customized to fit the most common gaffer using it. Sometimes added accessories are placed on the bench to make work more efficient (e.g. pipe holder).

BENCH ROLLERS: (Item) These are ball bearing rollers used in the place of the arms on the bench. Movement of the blowpipe is crucial to avoid the molten glass from getting off center and drooping. However, when putting on the punty it is an advantage to keep the blowpipe in one place but still be able to rotate it. The ball bearing rollers are a personal option by some gaffers but may be especially helpful with very heavy pieces

BIT IRON (SEE PUNTY)

BIT(S): (Item) Bits are smaller pieces of glass that are added to a piece to give it color, handles, stems, wraps, etc

BLACK SALVE (SEE ICTHAMMOL)

BLANK: (Item) There are several definitions for "Blank".

- (1) A blank may be a molten glass object ready to be further shaped into the final glass art.
- (2) A blank may be a cooled piece of glass that is decorated while cool and then reheated to be used to complete the object.

- (3) A blank may be a single color shaped as a small hollow glass cylinder. These blanks are then used to make larger pieces or are combined with a larger piece of glass to add to the final product.

BLANKSCHNITT (Term) Polishing the intaglio areas of an engraving to enhance the effect. This was especially popular in Nuremberg in the 17th and 18th century. **SEE INTAGLIO**

BLOCK: (Tool) There are several ways to shape molten glass. Wet newspaper is often used but wooden forming tools called "blocks" are often commonly used. Wooden blocks come in variety of shapes and sizes. The blocks are made from large chunks of fruit wood such as apple, cherry and pear. Special shaped blocks are used for making specific objects (e.g. round blocks are use to make large marbles and paperweights). The carbon from previous use and the steam during use helps protect the surface of the block. If allowed to dry out the blocks often crack, therefore, blocks are kept "waterlogged" by remaining in buckets of water at all times. There are many other tools to shape the glass (e.g. steam marver).

BLOCKER: (Person) This is the glass worker who blows the initial bubble through the blowpipe. It may be the gaffer or another person.

BLOW-BACK MOLD: (Tool) This is a mold with a bulb-like formation in the neck. The bulb-like formation allows the bottle to be severed completely from the blowpipe.

BLOWER: (Person) The assistant glass worker that actually blows the air into the blowpipe. The gaffer may elect to be his/her own blower (using a blowhose) to give himself/herself more control of the process

BLOWHOSE: (Item) The blowhose is a flexible rubber, latex or plastic hose which connects to mouth end of the blowpipe and allows the gaffer to blow without the aid of a blower. There may be a swivel in the hose which allows the blowhose to be more easily rotated at the bench. Some people naïve to glass blowing are amazed at how thin the tubing is but it only goes to emphasize that little pressure is actually needed for blowing heated glass.

BLOWING: (Action) "Blowing" is the act of inflating the molten glass through a blowpipe.

BLOW IRON (SEE PUNTY)

BLOW MOLD: (Tool) A mold in which the glass artist blows his/her gather. It can be to make a permanent shape or to put a surface pattern on the glass which will be shaped subsequently.

BLOWPIPE (PIPE): (Tool) The hollow metal (usually carbon steel or stainless steel) tube that is used to blow glass. It has a mouthpiece on one end and is usually flared

at the other end. The flare helps to retain the molten glass (i.e. the gather). Blowpipes commonly have a wall thickness of 0.062, 0.090 or 0.120 inches (at the mouth end). The diameter is usually between 0.54 to 1.00 inches at the mouth end and 0.75 to 1.50 inches at the flare end. The length is generally between 52 and 58 inches. There advantages to both carbon steel and to stainless steel. For instance, many artists prefer carbon steel for cup work and it is often available in many more sizes but it also develops scale more rapidly. Stainless steel bends easier.

BLUE AVENTURINE (SEE AVENTURINE GLASS)

BODY WRAP (SEE WRAP)

BOROSILICATE GLASS: (Item) This type of glass is commonly used by sculpture frameworkers because it transforms from the molten to rigid state quickly. It has a low COE (Coefficient of Expansion) which allows for more sudden changes in temperature. It is a harder glass than soda-based or lead-based glass.

BORSELLA (SEE JACKS)

BOWL: There are several uses/meanings for the term "Bowl".

- (1) (Item) A round-shaped open-top vessel used to hold/store solid or liquids. Typically they are small and shallow but exceptions are not unusual (e.g. punch bowl).
- (2) (Term) The top part of a goblet from which one would normally drink.
- (3) (Tool) BOWL (**SEE ORNAMENT HOLDER**)
- (4) (Item) (**SEE CRUCIBLE**)

BUBBLES: (Item) Bubbles are caused when gases or air get trap in the molten glass. Unwanted bubbles may be caused by having uneven-temperature molten glass (e.g. areas that are less hot tending to form bubbles) and impurities in the batch or cullet. The hotter the molten glass with great purity of quality the fewer unwanted bubbles. Also "squeezing" the glass art piece after charging will help eliminate unwanted bubbles. However, sometimes an artist will deliberately create bubbles in his/her art glass. Reticello is a good example of doing this by trapping the air between layers of the cane. Some artists install bubbles by using various metals in the glass art or using a sharp object puncturing the molten glass. Some surface molds (e.g. pineapple mold) deliberately cause bubbles at a regular interval.

BUCKET: (Item) Buckets are everywhere in the hot shop of a glass artist. Buckets are made from plastic, metal, wood and stainless steel; some buckets have water in them and others do not. They are used to keep the wood blocks and wooden tools (wood blocks, wood paddles, steamsticks, wood sticks) wet, a source of water to put on the newspaper, sand (for fires) and a convenient place to store items (without water) until needed (e.g. bit rods, pipes) or when finished with them. Most gaffers use blocks or wet newspaper when shaping an object and therefore have a bucket with water located behind the bench. Buckets are used for stripping glass and to wait for the glass the "pop off" the mail after use.

BURNER (BURNER HEAD): (Equipment) The burner controls the air and gas mixture in flameworking or delivers the gas to most furnaces and glory holes. Many furnace/glory-hole burners have safety features. Ceramic burner heads are designed to keep iron bits from the burner out of the glass and are often used for that reason. A burner head with multiple holes offers greater control and is quieter.

BURNER HEAD (SEE BURNER)

BURN-MARK: (Term) Burning glass results from getting it too hot (e.g. too much gas with a torch or too hot in the glory hole so that the glass "boils").

BUTTON (CHEATER BIT): (Term) The "button" is a small amount of clear glass placed on the object during the shaping to assure proper connection of the glass to the punty.

BUD VASE: (Item) A vase for holding a single, stemmed flower (e.g. a rosebud).

C

CALIPER (COMPASS, DIVIDER, GAGE, GAUGE): (Tool) A "caliper" is a tong-like device used to measure the size, diameter or dimension of an object. Many calipers have two locking curved arms that may rotate in or out from a central pivot point. The outward curving arms are used for inside measurements; whereas, the inward curving arms are used for outside measurements. When used for measurement, the distance between the tips are evaluated with a scale; whereas, when used for comparison the caliper is matched to an existing item. Straight arms are also used for drawing a circle or measuring distances. Antique calipers are considered to be superior to modern calipers by many glass artists. **SEE LIP CALIPER** and **PI DIVIDER** as examples of a specialized calipers.

CAN BURNER: (Equipment) A type of burner often used in furnaces. It is a single source of heat opposed to a Ribbon Burner (**SEE RIBBON BURNER**) in which there is a string of holes in a pipe.

CANE: (Item) Cane is a thin rod of glass. The original glass rod is thicker than the final cane and is pulled and stretched thin while still molten to make the cane the desired thickness. Sometimes the cane is made as a composite of different glass pieces fused together and may be twisted during the pulling in order to give the final desired effect. Cane is commonly used in Venetian Glass Style. Typical cane is 4-8 inches long. Sometimes cane will have an internal pattern or design. The internal design is itself an art-form. When these cane pieces are cut in cross-section to create millefiori (murrine). Different types of cane may include flat cane, reticello cane, pattern cane, Filigrana cane, Ballotini cane (helix ribbon twist inside) and Zanfirico cane (pattern on the outside).

CANE CHOPPER: (Tool) A cane chopper is a smaller version of the Color Cutter (**SEE COLOR CUTTER**). It is guillotine-like cutter with a holder for the cane. It is used to

get the cane into usable pieces without wastage. For instance, if a hammer and chisel is used instead, the shattering of the cane may result in a scattering of shards of glass that are either too large or too small for the desired piece. Cane is expensive and therefore, the cane chopper offers a relatively efficient inexpensive method to optimize the use of the cane.

CANE MARVER: (Equipment) The "cane marver" is a metal plate with grooves to put the cane and ensure even spacing.

CARBON FIBER FABRIC SHEETING: (Item) This is fabric which is heat resistant up to 800 °F. It is a great protective barrier against molten glass splashes and can withstand temperatures as high as 2600 °F for up to 2 minutes.

CAR KILN: (Equipment) Often used (but not exclusively) in casting glass shops. Sand casters often use this as well. It is really quite amazing to watch. One end and the bottom have wheels (this is the "car"). The "car" unit rolls into the other four sides making a box in which the bottom edge is "sealed" with sand. Allows for access to heavy and bulky objects without having to move everything.

CARNAUBA WAX (SEE WAX)

CARVING: (Action) The act of removing excess molten glass the object in which the artist is working. Direct carving of room temperature glass can also be done by using hand tools (e.g. Dremels, drills with diamond bits), sandblasting, lathes, diamond wheels, diamond angle wet grinders, belt sanders and saws.

CASING: (Action) Adding an additional layer of hot glass over an existing layer of glass. Often it is clear glass added to an existing object of color and design. Officially this is called "gathering" or "getting some gabs" (RIT term).

CASTING: (Action)

(1) Hot Casting: The process of pouring molten glass into a mold designed to receive the glass. The mold may be made of a variety of material (e.g. sand, plaster, etc).

(2) Kiln Casting: The process of melting glass in a mold inside a kiln

CASTING LADLE: (Tool) A ladle (large dipping spoon-like tool) used to pouring molten glass into the mold. It is often made of high grade cast iron. A typical casting ladle will be approximately 6 inches in diameter and typically holds 7-8 pounds of glass (but may hold as much as 25-to-30 pounds).

CAULDRON (SEE CRUCIBLE)

CERAMIC FIBER BLANKET, BOARD & PAPER (SEE FIBERFRAX)

CHAIR (SEE BENCH)

CHARGING: (Action) "Charging" is the process of filling the furnace with fresh batch or cullet for melting into glass. The process is time consuming (hours to days). Higher temperatures and longer time are required for finer batch than for cullet.

CHEATER BIT (SEE BUTTON)

CHECK: (Term) A crack on or in the glass that usually occurs after the glass object has been annealed (cooled). The check may be caused because of the COEs (Coefficient of Expansion) between different glasses in a single piece are not compatible or that other stresses in the glass object are too large to allow the annealing process to remove the stress.

CHILL-MARK: (Term) Any time an instrument (especially a metal instrument) is used on hot glass there is a potential to leave a cooled surface that will refract light differently than the surrounding glass. For this reason is it common and important to heat instruments and metal before use on the glass. Often you will see the assistant to the gaffer heating the instruments with a blow torch or by fanning the instrument briefly in the glory hole. A special type of "chill mark" is called a "**surface crack**". These small surface cracks can typically be removed by a skilled glass artist during the shaping phase of the object.

CHRISTMAS PICKLE: (Item) A pickle-shaped Christmas Ornament. The "Legend of the Christmas Pickle[®]" is a copyrighted (by HGA) explanation of the German tradition.

THE LEGEND OF THE CHRISTMAS PICKLE[®]

In
Old
World
Germany,
the last decoration
placed on the Christmas
Tree was always a glass pickle
... carefully hidden deep in the
boughs. Legend has it, that the
observant child who found it on
Christmas Day was blessed with
a year of good fortune
and a
special
gift

CHUBBY URN: (Item) An HGA term for a short vase with a wide shoulder and tapers without a neck or has a small lip-neck.

CHUNKED: (Term) A piece of glass that has been badly damaged.

CIRE PERDUE (SEE LOST WAX CASTING)

CLAMP: (Action) A technique for holding a partially worked piece of glass. For example, a gaffer may “clamp” the hot glass object to the side of the bench so that he/she may deliver a bit, overlay or foot by him/herself.

CLAW TOOL (SEE FINGERS)

CLAY POT (SEE CRUCIBLE)

COE (SEE COEFFICIENT OF EXPANSION)

COEFFICIENT OF EXPANSION (COE): (Term) A better term is Linear Expansion Coefficient (LEC) but COE is a jargon term often used. Glass expands when it is heated and contracts when it cools. The rate of expansion during heating is called the Coefficient of Expansion or COE. For example a COE of 90 means it the glass will expand 0.000009 inches for every one degree of Centigrade temperature change (1.8 °F). COEs of 90 (Bullseye) and 96 (Spectrum) are commonly used in hot glass blowing. As a comparison Pyrex (Corning) has a COE of 32, window glass is usually 84-87 and typically flameworking glass is approximately 104. Bullseye website gives a good example of incompatibility: “To give you an example, a 10 inch piece of Bullseye glass will shrink about 0.046 inches from 950 degrees Fahrenheit to room temperature, whereas Spectrum will shrink 0.049 inches. That 0.003 inches is too much for the two types of glass to fuse together and therefore they are not compatible with each other (incompatible)”. The higher the number the “softer” the glass. **SEE COMPATIBLE GLASS.**

COLD SHOP: (Term) A section of the glass shop in which room temperature glass is worked, polished, cut, engraved, ground, drilled, sandblasted and/or cleaned. It is commonly apart from the “Hot Shop” in which the furnace, annealer and glory hole reside.

COLD-WORKING: (Action) Working on the glass object after it has been annealed and at room temperature (working without heat) to refine the object further. It may include polishing, cutting, engraving, grinding, drilling, sandblasting, cleaning and/or UV gluing. The equipment may include rotary devices fed with water and abrasive, hand tools, diamond drills, wet sanders, grinding wheels, etc. Glass is usually worked wet to avoid heat build-up which may result in damage to glass and/or tools. It is an important part of the artistic process.

COLLAR: (Technique, Item)

- Verb: The technique of gathering glass and creating the collar at the end of the blow pipe.

- Noun: The collar is a ring that is used to hold cane in place on a piece in which the artist is working.

COLOR: (Term) Most colored glass comes in the form of a one-inch bar but it is also available in powder, various sizes of frit, cane, shards and sheets. The approximately one-foot-long, one-inch-diameter bars are cut into smaller pieces for use. The color is made by adding elements, minerals, metal oxides and/or other ingredients to molten glass in large crucibles. The glass is then rolled into bars. Many of the ingredients used to make the color are toxic or poisonous in high concentrations. Opaque colors are often the same color before and after melting whereas transparent color is not obvious until after the blowing (it appears black before blowing). Major manufacturers of glass include Gaffer, Kugler, Reichenbach and Zimmerman. Some artists prefer to make their own color.

COLOR CRUSHER: (Tool) A cylinder (usually a steel pipe) closed at one end with the other end open to allow a plunger consisting of a steel disk (fits snugly in the cylinder) attached to a long stem to be inserted. Large pieces of glass (often colored) are placed into the cylinder and the plunger is placed on top of the glass. The stem (handle) is pounded with a hammer. This produces dust, frit and smaller pieces of glass.

COLOR CUTTER: (Tool) A guillotine-like cutter with a holder for the glass bar. It is used to get the color bar into usable pieces without wastage. For instance, if a hammer and chisel is used instead, the shattering of the glass bar may result in a scattering of shards of glass that are either too large or too small for the desired piece. Color glass is expensive and the bars of color are brittle. Thus, the color cutter offers a relatively efficient inexpensive method to optimize the use of the glass bar. **SEE CANE CHOPPER** as an example of another form of a cutter.

COLOR KILN/OVEN: (Equipment) A small kiln used to preheat pieces of color. This allows the color to be "picked up" and incorporated into the existing hot glass object without cracking. Often there is a blackboard near to plot out the various colors which may look similar until blown.

COMPASS (SEE CALIPER)

COMPATIBLE GLASS: (Term) The ability to fuse different pieces of glass together is determined (in the most part) by the Coefficient of Expansion (COE). The two pieces of glass are "compatible" if fusion is feasible without the risk of cracking the glass due to stress when cooling the final product. In addition, there are many glass coatings (e.g. iridescent, dichroic, gold leaf, etc) which may contribute to the compatibility of the two pieces of glass. (**SEE COEFFICIENT OF EXPANSION**).

COMPRESSOR (SEE AIR COMPRESSOR)

CONE: (Tool) The "cone" is typically a graphite cone-shaped tool approximately 7 inches long with a 3 inch diameter and a handle. It is used for shaping or reaming. It is used to provide a variable round shape or hole in the glass object.

CONTACTOR: (Item) A relay-like device often used as a safety cutoff because of electrical leakage through SCRs. A SCR (silicon controlled rectifier) is a switching device that turns current on or off in control panels. Annealers often have contactors and they make a big "click" noise when the contactor is activated.

CONTEMPORARY GLASS: (Term) "Contemporary Glass" is a slang term referring to "Contemporary Glass Art". Contemporary refers to an item recently made compared to an antique. Contemporary Art is art produced in the present period of time or art produced within "our lifetime", recognizing that lifetimes and life spans vary. Basically it refers to the end of World War II to the present day. However, the definition of what is contemporary is always on the move. For instance, the works from the Contemporary Art Society which was bought in 1910 would no longer be described as contemporary.

CONTINUOUS MELT FURNACE (SEE FURNACE)

CONTROLLER: (Item) A device used to hold a specific temperature or to change the temperature slowly. Digital, mechanical and analog solid state controllers all exist. Some controllers will operate (control) as many of 5-8 units (e.g. furnaces, annealers, garages, color kilns, etc).

COOKIE: (Item) A small amount of molten glass dropped onto the marver to be used as a foot.

COOLER (SEE PIPE COOLER)

COPA: (Tool) A tool with a U-shaped channel that tapers narrower and has a handle. It is used for shaping wraps into round.

CORD: (Term) Lines of clear glass with a different COE (Coefficient of Expansion) than the surrounding glass. As a result there is a difference in the light refraction. This is often caused by poor mixing of the batch (especially the batch at the bottom of the furnace). It may present as streaks, "stones" or haziness.

CORE DRILLING: (Action) The act of putting round holes in cold glass. Often a water-fed core-drill bit is used in which the water goes through the center of the bit allowing for cooling and lubrication as it cuts through the glass. The bits come in different sizes.

CORE FORMING: (Process) The act of forming a glass vessel by gathering molten glass around a core form which is supported by a steel rod, mandrel or handle is called "core forming". It was developed by the ancient Egyptians. The glass may also be winded (trailing) around the form. The vessel is annealed and then removed from the form.

CORK DUST: (Item) Dust from cork. It is used to provide a carbon surface on metal molds.

CORK PADDLE(S): (Tool) Thick typically round/oval (but can be rectangular) pads of cord used to flatten or indent sides of a blown piece.

COWL BOARD: (Item) A wooden face mask used to protect the assistant working with the furnace.

CRACKLE GLASS (FRENCH CRACKLE, ICE GLASS): (Process) The act of dipping a hot piece of glass into a bucket of cold water to create small fissures on the outside of the glass but leaving the inside intact. **SEE OVERSHOT GLASS** as it is sometimes confused as Crackle Glass but they are very different processes.

CRACK OFF BIN/BARREL/BUCKET: (Item) After use, a small amount of glass is often left on a blow pipe or punty. Typically this glass will break off as the glass cools but in the process it may "shoot" shards of glass outwards creating a potential hazard. Thus, the pipes and punties are put in a dry bin/bucket to capture the shooting glass. The metal buckets are heat proof. Sometimes punties are put in water filled buckets. These "crack off bins" are also where mistakes and broken glass commonly go. Barrels are sometimes used instead of bins. Later clear glass may be separated from color glass so that the clear glass may be reused.

CRACK OFF TABLE (SEE DROP OFF TABLE)

CRANBERRY GLASS (GOLD RUBY GLASS): (Item) A pink-to-red glass made by adding gold chloride and a small amount of stannic chloride (tin) to the molten glass. Cranberry Glass dates to late Roman Empire but was the most famous period was in the 19th Century Britain during the Victorian Age. Red, purple and pink were considered the colors for royalty. Cranberry Glass was used primarily in expensive decorations, table displays for holding flowers, wine glasses, decanters and finger bowls. Cranberry Glass is called Gold Ruby Glass in the United Kingdom.

CRAP GLASS: (Term) A HGA jargon for a glass object that was damaged in the process of the making, did not result in an aesthetically pleasing form, had undesirable blemishes, failed in the beauty, or was not acceptable for any number of other reasons. HGA believes that "Quality Matters".

CRIMP (MASHING PLIERS): (Tool) Crimp and crimpers have several different meanings.

- (1) A pliers-like tool with metal pads on the end that have a specific pattern. Typically, a hot piece of glass is placed on the existing hot glass object (being made), trimmed with shears and then "crimped" immediately to make the design or impression desired. There are leaf crimps, dragon wing crimps, shell crimps, pedal crimps, etc.
- (2) Pliers with smooth pad on the end are also called crimps and are used to shape the glass.
- (3) A specialized tool used in the making a Millville Rose type of paperweight. The crimp provides the shape of the pedal. The crimp is pushed through the color on the bottom of the otherwise clear paperweight (forcing the color up and in the shape of the pedals).
- (4) A "crimper" is a wooden form used to give a bowl a "crimped" rim.

CRUCIBLE (CAULDRON, BOWL): (Item) Crucible is a vessel that holds the molten glass inside the furnace. The hot glass glows such a brilliant orange/yellow that the crucible is difficult to see. It is usually a large replaceable ceramic pot. Depending on the size of the crucible it may hold a hundreds to tons of glass. The crucible must be able to withstand months of intense heat without dissolving or losing large pieces (known as "stones") into the glass.

CRYSTAL: (Term) Colorless lead-based glass with a brilliant high-refractive index. Some of the famous crystal glass companies include Waterford, Steuben and Libbey.

CULLET: (Item) Batch which had already been melted into glass. It is often pieces of broken or even waste glass suitable for remelting. Clear glass is the most common cullet or although if a hot glass studio has a color pot then color cullet of the correct hue could be used as well. Melting cullet takes less total energy and requires a lower melting temperature than batch. However, melting batch is believed to be kinder to the furnace than cullet because cullet cracks and bounces around before it melts. The source of the cullet must be carefully considered as the COE must be correct and impurities may ruin the existing molten glass.

CUT GLASS: (Item) Glass that has been cut with wet grinding stones, blades or drills to product a pattern (**SEE CUTTING**).

CUTTING: (Process) The technique of grinding a pattern into the glass by using rotating wheel coated with diamond dust or an abrasive. Often there are various steps or stages to cutting the glass, starting with a course outline and ending with a fine polish. An example of a fine glass art piece is called "The Portland Vase" which is a Roman cameo glass vase dating to AD1-AD25.

CUT-TO-CLEAR: (Process) Cutting the glass to show all the layers of the glass object. Often many layers are required to have the dramatic effect desired. The artist literally cuts the glass all the way to the clear glass.

D

DAY TANK: (Equipment) A furnace that is used and is charged frequently (often daily). These pots are usually bigger than a free standing pot furnace. (**SEE FURNACE**)

DEVITRIFICATION: (Process) A complex process in which the glass becomes partly crystallized as a result of both formation and static temperatures in a furnace near the temperature range of 1700 °F.

DIAL INDICATOR: (Tool) A device that is used to determine the bend of a pipe. Blowpipes often get bent in the process of using them. This is not surprising as all the weight is on one end and the blowpipe leverages the hot molten glass from place to place

during the process of creating the art. The dial indicator is used to determine how much of a bend exists. They are correct to 0.001 inch. Most artists want their blowpipes to be within 0.003 inches of true center.

DIAMOND MARVER: (Equipment) A marver that, similar to the cane marver, has an embossed pattern. The Diamond Marver has points cut into it. The diamond pattern is on one side only and has a similar effect as the pineapple mold.

DIAMOND POINT ENGRAVING: (Action) The act of using a diamond pointed tool to engrave on glass. It was introduced by the Venetians in 16th century and refined in the Netherlands in the 17th century. Stripling was done by making small marks with the diamond point in the glass and like pointillism if the marks were placed properly a pattern or design could be produced.

DIAMOND SHEARS: (Tool) A tin-snip-like tool with two blade surfaces: the outer aspect is rounded and used to hold a pipe and the inner aspect is sharp in order to cut the glass. HGA often uses small, thin diamond shears because of the Venetian-style work. These diamond shears are very sharp and sap less heat from the hot glass,

DICHROIC GLASS: (Item) Glass that has been thinly coated with metal oxide. These metallic layers produce one color when light reflects off the glass and another color when light is transmitted through the glass.

DIDYMIUM LENS: (Item) Eyewear that cut down on the UV rays emitted from the furnace and glory hole. These lenses are often "pink-to-purple" in color and are protective to the artist eyes. They are very commonly used by flame workers.

DIGITRY: (Equipment) Equipment made by the Digtry Company is often referred to as "Digtry". Often the Digtry is referring to a programmer-electronic temperature-controller used to manage the annealer(s) and/or furnace(s). GB1 are used for a single oven but can hold up to 15 set points for 10 different temperature profiles. The GB5 can control up to 5 separate annealers. Most hot shops have GB4 or GB5 Digtry.

DIP MOLD (SEE PATTERN MOLD)

DIVIDER (SEE CALIPER)

DOUBLE OVERLAY: (Action) Taking two separate gathers of glass in order to overlay or cover one another. Typically a color is gathered on top of another. However, A clear layer of glass may lie between the two colors.

DOWEL: (Tool) Wooden rods used to help shape the glass art object.

DRAWING-OUT SALVE (SEE ICTHAMMOL)

DROP OFF TABLE (SEE KNOCK OFF TABLE)

DUCKBILL SHEARS: (Tool) A tin-snip-like tool with two open-edged blades to trim the lip of glass vessels. The tips of the blades flare outward from each other at the tips. It reminds some artists of the lips of a duckbill platypus (hence name).

E

ELEMENT: (Item) The electrical piece used to heat the annealer.

EMBOSSSED: (Term) Raised design or text on the surface of the glass.

ENAMELED GLASS: (Term) Glass powder opaque colors melted onto the surface of the glass object. Paradise Paints and Thompson Enamels are examples of companies which supply this glass powder.

ENCALMO (INCALMO): (Action) The technique of joining two or more blown pieces of glass (bubbles) while hot into a single piece. Typically one piece is shaped into a cup or collar on a punty and the other is a cylinder. The cup/collar look like small cups with a hole in the bottom. The cup is placed onto the cylinder to make a single piece. The process may be repeated as often as desired (i.e. double encalmo, triple encalmo, etc). Below is an example of a quadruple encalmo round bowl.



ENGRAVING: (Action) The process of cutting a design or pattern into the room temperature glass object with a diamond wheel. The design is usually more detailed and complex than regular cut glass work. Types of engraving: Relief Cutting (Hochschnitt), Deep Cutting (intaglio or Tiefschnitt) and Diamond Point Engraving. Jiri Hrcuba (1928-2013) is considered legend in glass engraving. **SEE RELIEF CUTTING. SEE INTAGLIO. SEE DIAMOND POINT ENGRAVING.**

ETCHING: (Action) The process of using acid to score/mark the glass to make a decoration, design or pattern on the glass surface. A typical acid used is hydroflouric acid (HF) which will destroy silica and is very dangerous.

EXACT TORCH: (Tool) A high pressure torch used to heat specific parts of the glass object while it is being made. During the process of creating glass art it is important to keep the object hot at all times. This means tools may need to be heated before use and distal parts of the piece may need heating at the bench because these regions are the ones which will cool the fastest. At other times the gaffer may wish for one area to be especially hot because he/she is getting ready to do something to that part of the glass object. The Exact Torch has interchangeable heads and produces heat as high as 400,000 BTU. It is used in aspects of hot glass art such as sculpting, blowing, flameworking, etc.

EXTRUDER: (Tool) A tube-like device in which pressure is applied at one end and the soft material within the tube is forced out the other end (think of tooth paste). Use in glass art is limited because of the heat of the glass and the fact that free-flowing glass tends to drop off as blobs rather than make rods.

EYE (SEE FLAME SENSOR)

EYE PROTECTION: (Tool) This is listed as a "Tool" because it is an essential part of the glass art field. Around the furnace and glory hole, artists and assistants should wear #3 or #4 welders' shades. Clip-ons are commonly used but some artists/assistants prefer to have the welding glass in the frame of the yoke. Research has recently shown that it is the infrared (IR) rays and not the ultraviolet (UV) rays that cause the damage. All glass workers should have break resistant glasses to protect their eyes from glass shards and fragments. (Also **SEE SAFETY GLASSES**)

EYE WASHES (SEE SAFETY SHOWER AND EYE WASHES)

F

FAUX SEA GLASS (SEE SEA GLASS)

FEATHERING: (Action) The process of dragging a metal-pointed instrument (like an ice-pick with a right angle curve at the tip) to create a decorative design in the glass. Cane or a wrap is applied to the glass art piece and then the instrument is dragged across the surface of the piece. The effect looks similar to that seen on top of a Napoleon Desert.

FERRITTI: (Item) Two or more short rectangular metal or ceramic bars which are placed on top of the ferro on the pasturale to keep the cane in place. Commonly used in Venetian Style hot glass art.

FERRO: (Item) A metal plate which is placed on top of the pasturale. The plate is typically 6 x 12 x 0.25 inches in size but may be smaller or larger as desired. The cane is placed on the ferro with the ferritti holding the cane in place. The plate is often coated with kiln wash (a ceramic slurry) to keep the cane from sticking to it. Then the cane is fused together in the glory hole. This process of fusing the cane together is sometimes called

“tack-fusing”. The fused cane is then picked up for use on an existing hot glass object. This is a Venetian Style of glass art.

FIBERFRAX (CERAMIC FIBER, FRAX): (Item) A high temperature insulation material. It comes in various forms and temperature ranges. It replaced asbestos as the main insulation for modern glass shops (asbestos inhalation is associated with cancer). It is a white fluffy fabric that is spun ceramic insulation used insulate from heat up to 2300 °F. It is dangerous to inhale frax and unsafe to handle.

FILE: (Tool) A metal tool with graded striations. An outdated technique used be to use the corner of the file to notch the place where a clean break in the glass is needed.

FINGERS (CLAW TOOL, GADGET, GIMMICK, HOT FINGERS): (Tool) A device often used to hold small glass objects by flameworkers. Often it consists of a tube with three or more spring steel extensions (fingers).

FINING (SEE SQUEEZING)

FINISHER: (Person) The finisher is the person that puts the final or finishing touches on the glass before it goes into the annealer. Almost always the finisher is the gaffer.

FINISHING: (Term) The act of concluding the final product. It is done just before the hot object is placed into the annealer.

FIN MOLD: (Tool) This is a mold without an outer wall but with “blades” in which the glass is pressed. Most molds have an outer wall and an interior design (e.g. pineapple mold). A fin mold has no outer mold and thus is not limited by size. Some fin molds (e.g. those made by Jim Moore) have removable curved or straight fins which adds greatly to the versatility of the tool. The mold is commonly used to make pumpkins/squashes, goblets and Merletto glass art (**SEE MERLETTO GLASS**).

FIRE BRICK, HARD: (Item) This is a very hard and heavy brick designed to withstand high temperatures. It is a poor insulator. It is used to line furnaces and glory holes.

FIRE BRICK, INSULATING (IFB): (Item) This is a very soft, light and easily cut material that is used to line kilns and as a backing for the hard fire brick.

FIRE POLISH: (Action) Sometimes glass is reintroduced to heat (usually in the furnace) to melt irregularities (such as a punty mark [**SEE PUNTY MARK**] or break-off point). It helps the glass maintain its shiny surface after it has been manipulated by grinding or sandblasting.

FIRING: (Action) The reheating of an object while it is being worked.

FIRST AID KIT: (Item) Not surprisingly, a first aid kit is common to most hot glass studios as burns are frequent and cuts common. However, there are often unusual components the hot shop first aid kit. You may find honey, superglue, black salve and near-by aloe vera plants. With a burn the first aid is to rapid cool the skin tissue (this prevents further heat injury which may continue after the burn has taken place and then to avoid infection while the burn site heals itself. Honey is commonly used by hot glass artists on burns to keep infection down. Superglue is sometimes used in place of stitches. Icthammol (**SEE ICTHAMMOL**) or black salve is used to “draw out” foreign objects (e.g. glass splinters). Aloe vera sap is often used in place of honey to help with healing of a burn (it is not uncommon to see Aloe plants growing around the hot shop). Although none of these treatments are approved by the American Medical Association and HGA cannot recommend the use of any of these homeopathic remedies, they are common to a hot shop.

FLAME SENSOR (THE “EYE”): (Item) A safety device that is part of the combustion train which ensures that a flame actually is present when needed. The Purple Peeper (**SEE PURPLE PEEPER**) works by sensing the presence of UV from the flame; whereas, the thermocouple detects the heat of the flame.

FLAMEWORKING (LAMPWORKING): (Process) The technique of forming glass objects using a table-top oxygenated-natural-gas blow-torch to shape rods, cane and tubes glass into the desired art form. The glass is manipulated with tongs, forceps, knives, fingers, tweezers and other hand tools. The Coefficient of Expansion of the glass typically used in flameworking is different from that used for glass blowing and thus, the two forms of glass are generally not compatible. Historically oil lamps (hence name: lampworking) were used with foot-powered bellows. Small sculptures, jewelry, smoking pipes, cup and even goblets are examples of items often made by flame workers.

FLASH: (Action) A quick/rapid reheating of the hot glass object in the glory hole. This is done periodically during the making of hot glass art in to keep the glass pliable and to avoid cracking. It is a “holding state”: hot enough not to break but cool enough so it can be shaped.

FLOPTASTICS: (Term) HGA verbiage for a piece of glass that has been converted from the original design into a floppy bowl (bowl with a ruffled edge). It is usually a piece that failed to take the form as it was originally intended and other unpleasanties and was thus converted into the floppy bowl. Note that not all floppy bowls are the result of a failed original design. Most floppy bowls are designed to be floppy bowls from the beginning.

FLOWER FORMS: (Term) The shapes of flowers are a key tool used by florist and is in HGA’s VASE DETERMINATOR. The forms are used to add to the aesthetic value of the floral arrangement. The three basic forms are:

- Round: Circular-shaped flowers are often the center piece of a floral arrangement. The eye is naturally drawn to these beauties. Examples are roses, lilies, daffodils, carnations and many others.
- Line: Flowers that form in a row (line) on the stem. They are often used in large floral arrangements to add color and texture. They help draw the eye from the edges down along the line to the center of the design. Examples are iris, gladiolus, snapdragon, dendrobium orchids and many more.

- **Spray:** These flowers have multiple branches from a main stem and splay outward (spray). These flowers and berries are used to offer softness and contrast. They are subservient to the dominant round flowers but offer fullness and support. Examples are oncidium orchids, Peruvian lilies, hypericum berry and many more.

FLUTED: (Term) There are two definitions for fluted:

1. When the shape “flares out” at the foot (bottom) or top (lip) of the vessel it is considered to be fluted
2. Lines, grooves or designs formed in the glass to give a vertical wavy appearance

FOIL (SEE LEAF)

FOOT: (Item) The bottom of a glass object on which the art sits. In wine glasses and goblets it is usually a round disc. Examples of feet include: blown foot, cookie foot, Swedish foot and dropped foot.

FOOTING TOOL (FOOTER): (Tool) A wooden tool used to help shape the thin foot of a wine glass or goblet. Commonly the tool is made from cherry wood but other fruit woods may be used as well. It is hinged along one of the long edges to allow easy access. The wood is shaped in a semicircular design with a notch for the stem. The wet tool is brought to the molten glass open and then closed around the glass to allow the upper side of the foot to be formed by the wooden board and the bottom (flat) side is formed by the other part of the wooden tool.

FORK: (Tool) A long metal rod that is split (forked) on the end to be used to put work (often a goblet) in for shaping or to rearrange objects in the annealer or the garage. It is thin metal and heated before use to avoid thermal damage to the glass. Older versions may be coated with fiberglass or frax.

FOUNDING: (Action) Heating the glass to the proper usable temperature.

FREE BLOWN GLASS: (Term) Glass shaped by inflation with a blowpipe and manipulated with hand tools.

FREE FORMED: (Term) A glass object that is formed without the use of casting or forming tools (e.g. a footer). Although a surface mold (e.g. pineapple mold) may be used to give the surface of the glass a specific texture, the shape of the final object is hand crafted.

FRIENDSHIP BALLS: (Item) HGA terminology used for glass orbs that are hung from a stand and signify friendship between the giver and the receiver. It is especially meaningful if the Friendship Ball was blown by the giver as it will always contain the life’s breath of the giver. Sometimes the giver and the receiver make the friendship ball together via one of the “HGA Ornament Blows”

FRAX (SEE FIBERFRAX)

FRENCH CRACKLE (SEE CRACKLE)

FRIT (FRITT): (Item) Crushed pieces of glass that are melted into existing hot glass objects to produce color, patterns or designs. They frit may vary in size from the smallest (powder) to the largest (shards). Most frit is the size of grape seeds to the size of a watermelon seed. Frit may be bought or made in a crusher. It is the most common way to add color to a hot glass art object.

FUMING CHAMBER: (Equipment) A closed box with a filtered exhaust fan to the outside. It is used when chemicals are applied to the glass, to masks for sandblasting or other processes in which a toxic fume or dust is released. A variant of this is called the "Powder Booth" (**SEE POWDER BOOTH**) and is used to avoid the inhalation of fine glass powder.

FURNACE (DAY TANK, CONTINUOUS MELT FURNACE, DAY POT FURNACE, TANK): (Equipment) The device in which the glass batch or cullet is melted and then holds the molten glass for use in the hot shop. The temperature is generally around 2000-2200 °F inside the furnace. There are several types of furnaces:

- Day Tank (**SEE DAY TANK**)
- Continuous Melt Furnace or Tank Furnace: It is a furnace with a continuous process with raw glass being melted on one side which then flows under a barrier to be picked up on the other side. In this type of furnace the whole interior is holding the molten glass
- Pot Furnace: The most common type of furnace is a Pot Furnace in which the molten glass sits in a crucible. Crucibles need periodic replacement as they will crack after months to a couple of years of use.

FUSING: (Process) The technique of heating multiple pieces of glass in a kiln until the bond together (fuse). After placing the pieces of glass in the proper perspective with each other the temperature of the kiln is raised to fusing temperature (1510 °F), the pieces fuse and then the kiln is slowly cooled to room temperature. The heating takes several hours and cooling may take even longer. Examples of fusing include partial fuse, tack fuse (**SEE TACK FUSE**) and full fuse.

G

GADGET (GIMMICK): (Tool) There are several definitions for the word "Gadget" or "Gimmick".

1. A tool made to hold hot glass instead of the punty. It is often used to hold the foot of the glass object.
2. **SEE FINGERS**
3. A tool for helping with a specific shape (e.g. lip shaper, neck former, vase footing)

GAFFER: (Person) Gaffer has several definitions.

- (1) This is the person who is in charge of the production of the hot glass object. Others on the team may have more experience but the gaffer is in charge. He/she usually shapes the glass and sits at the bench. Although hot glass blowing is sometimes done as a single individual ("going solo") because of safety and efficiency it is usually done with a team of people including the gaffer and at least one assistant. Historically, "gaffer" means "grandfather" in Britain. Usually (but not always) the hot glass gaffer is an older person who is teaching the assistant(s) the skill of the art.
- (2) Name of the future HGA shop mini-bulldog, pug or Scottish terrier
- (3) The gaffer in the movie industry is the head electrician

GAGE (SEE CALIPER)

GARAGE: (Equipment) An oven used to "park" (as in a garage) pieces of glass to keep them hot for use in an existing piece of hot glass art. Many garages have two sides: cold side (approximately 900 °F) and a hot side (approximately 1050 °F). The making of Venetian goblets is a good example of how a garage may be used. The stems and bowls may be made and placed in the garage. The stem is then picked up at the garage and attached to the foot and finally the bowl is attached to the stem. Thus, it keeps the stem and bowl hot until ready for use. Instead of a separate oven, some hot shops use a specially designed annealer to serve as the garage.

GAS TANK (SEE TANK, GAS)

GATHER: (Action, Item) Gather can be used either as a verb or a noun.

(Verb) The process of getting a ball of molten glass onto the blowpipe or punty (i.e. to "gather" the glass). The technique involves twisting or winding a ball of glass onto the pipe.

(Noun) The ball of molten glass taken from the furnace. That is to say "you gather the gather". The glass object may require more than one gather to be completed. The gathers are numbered: first gather, second gather, third gather, etc. The gathers after the first gather are of a greater volume than the first because it must cover the entire first gather. Typically the first gather is about 4 ounces of glass, the second is about two pounds of glass, the third is about five pounds of glass and the fourth is about twelve pounds of glass (for a total of nearly twenty pounds). However the temperature of the molten glass and diameter of the blowpipe also determine the amount of glass gathered. The second gather onward may or may not be after color, frit, bits, cane, shards, etc have been added to the hot glass object.

GATHERING BALL (SEE GATHERING IRON)

GATHERING IRON (GATHERING BALL, GATHERING ROD):

(Tool) A long thin rod or a hollow ball on the end of a punty. It is used to gather more glass than could normally be accomplished in a single gathering. Small casting can be done with the gathering ball.

GATHERING RING: (Item) This is a clay ring that floats on the top of molten glass in large tank furnaces in order to gather unwanted crud/debris floating within the tank.

Thus, keeping the glass “clean” from the undesirable material. Crucible furnaces usually do not need a gathering ring because the surface area is smaller.

GATHERING ROD (SEE GATHERING IRON)

GAUGE (SEE CALIPER)

GFCI (Item) GFCI = Ground Fault Circuit Interrupter. It is a safety device used to protect individuals from electrical shock. Most electrical outlets have two vertical slots and many have a round hole centered below the two slots. The left slot is larger than the right and is called “neutral”; while the smaller right slot is called “hot”. Outlets work by allowing electricity to flow from the right (hot) slot to the electrical device back to left (neutral) slot. The GFCI monitors the amount of current in the right and left slots. If there is an imbalance then the switch is “tripped”. For instance, if you were working on a wet surface some of the current could pass from the device through you to the ground and thus the amount of current returning to the neutral slot would be smaller than that leaving the right slot. The GFCI “tripping” and cutting off the electricity would protect you from getting a potentially injurious shock. It detects mismatches as small as 4-5 milliamps and reacts as quickly as one-thirtieth of a second.

GILDING: (Action) The process of putting on gold, copper or silver leaf on the surface of the glass.

GIMMICK (SEE FINGERS)

GLASS: (Item) A transparent amorphous material usually consisting of a mixture of silicates in a non-crystallized form. Glass is typically formed from raw materials (batch) by heating to allow the materials to melt together. Then the glass is cooled rapidly becoming rigid. Glass weighs about 150 pounds per cubic foot.

GLASS ART SOCIETY (GAS): (Society) An international non-profit organization dedicated to the advancement, appreciation, education, understanding and development of glass arts throughout the world. It was founded in 1971. “The Society strives to stimulate communication among artists, educators, students, collectors, galleries, museums, art critics, manufacturers and all others interested in and involved with the production, technology and aesthetics of glass.” The web site is: <http://www.glassart.org/>.

GLASSBLOWERS’ TRAITS: (Term) Characteristics which typify glass artists. They include distinguishing virtues, attributes and mannerisms such as independence, productivity, disinhibition (free thinkers; “think outside of the box”), keen perception, kindness, wisdom, vision, sense of urgency, talent, patience, non-judgmental, creativity, foresight, team-work, experience and love of nature. Like most artists, glassblowers may be either extroverts or introverts.

GLASSBLOWING (SEE TALENT): (Action) The process of forming a glass object by inflating (blowing) molten glass through a hollow steel tube (blowpipe). The glass may also be manipulated in other ways such as shaping with tools, shaping on a marver and

even using gravity to assist in the shaping. Glassblowing is different than flameworking or casting.

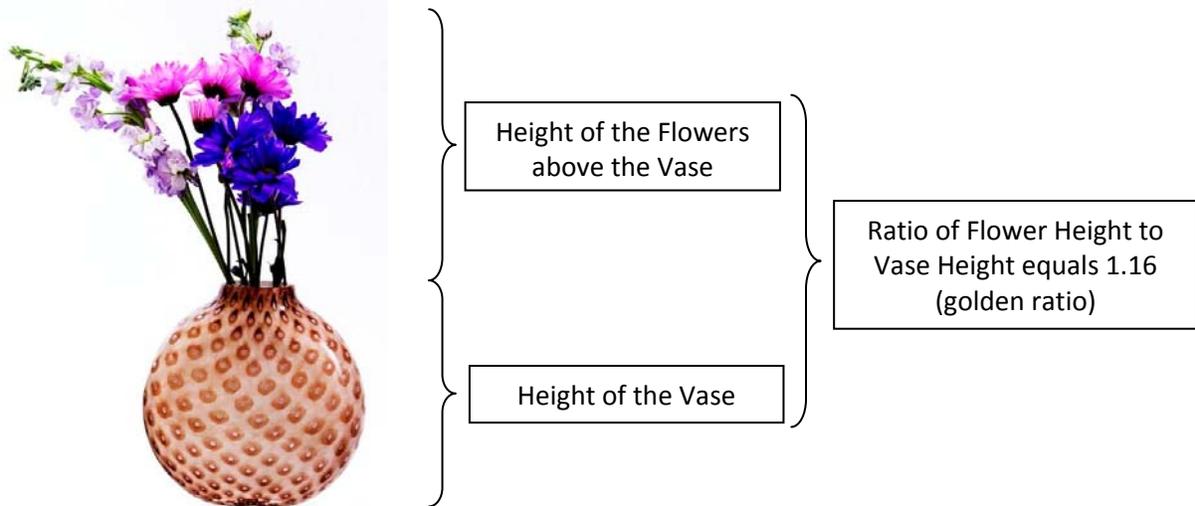
GLASSIPEDIA: (Term) This encyclopedia is termed the "Glassipedia" by HGA. It has been submitted for Copyright protection.

GLASSMAKER'S SCISSORS (SEE SHEARS)

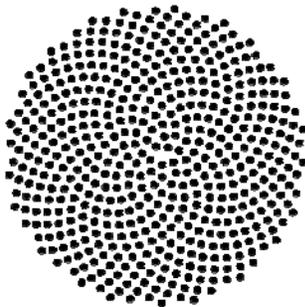
GLASS STYLES: (Term) There are many styles and techniques of working with hot glass to form art. Some (but not an all inclusive list) include: American, Blown, Carving, Casting, Cutting, Czech, Engraving, Etching, Flameworking, Fusing, Hot Casting, Mosaic, Murano, Sculpturing, Slumping, Stained Glass, Swedish, Venetian and Mixed Media. HGA is primarily (but not exclusively) dedicated to blown Venetian Style of hot glass art.

GLORY HOLE (REHEATING CHAMBER): (Equipment) A heating chamber (usually gas) used to reheat a work which is in the process of being made. It is often a large insulated drum-like chamber which maintains a temperature of 2000-2400 °F. Often the gaffer or the assistant will return the hot glass object to the glory hole to reheat it (avoiding cracks). The drum will have at least one door that may have several different layers (allowing for more layers to open for larger pieces). The doors may be manually operator or on an air compressor (trigger by a foot pedal).

GOLDEN RATIO: (Term) The "Golden Ratio" refers to the relationship of two segments of a figure or structure. For instance, it could be the ratio of the distance between the eyes and the length of the nose or the height and breadth of an arched doorway. The golden ratio is approximately 1.16. The Golden Ratio is considered by many artists and architects as the proportion giving the most aesthetically pleasing form or demeanor. *In many ways the golden ratio is considered to be the mathematical equation for beauty.* The ratio dates back to Euclid (325-265 BC) and used by Leonardo da Vinci, Salvador Dali and Frank Lloyd Wright. It is considered essential in our perception of beauty. In fact, plastic surgeons often consider the ratio when making decisions about surgery (see Dr. Marquardt's website: <http://www.beautyanalysis.com/>) and is considered to be independent of gender, race, culture or era. HGA uses the Golden Ratio as it pertains to height of the vase to the height of the flowers above the vase. You can use HGA's vases to match the golden ratio based on the stem length of your favorite flowers (Click on the "Vase Determinator" link in the Menu Bar of HGA's website). An example of the golden ratio is illustrated in the flowers-to-vase ratio from the flowers in this "pill shaped" vase from the HGA Vintage Series.



The golden ratio is common in nature. For instance, the distribution of seeds in the sunflower follow a Fibonacci spiral based on the golden ratio. The seeds distribution from the sunflower in the first picture is stylized in the subsequent (second) illustration. An HGA's low-bowl reticello vessel mimics this spiral (shown in the third picture).



GOLD RUBY GLASS (SEE CRANBERRY GLASS)

GOLD AVENTURINE (SEE AVENTURINE GLASS)

GOLDSTONE (SEE AVENTURINE GLASS)

GLOVES (KEVLAR MITTS, MITTS): (Item) Heat resistant gloves (mittens) which are used to carry the finished hot glass object to the annealer after it was either broken off into the gloves or broken off onto the knock off table. The gloves are generally preheated to get rid of moisture and to avoid thermal shock to the hot glass art. Also **SEE OVERMITT**.

GRAAL: (Item) A parison of glass which is carved, sandblasted, engraved or etched at room temperature and then reheated for further refinement which may include fusing to

another glass object, encasing in clear glass and blowing out for further work and/or adding color, bits, frit, cane, etc. This process was first described in Sweden in 1916.

GRAPHITE PADDLE: (Tool) A flat device used to shape the glass. Graphite does not sap the heat from the glass object as much as some other forms of paddles and thereby allows for more working time before reheating the object. Unlike a wooden paddle, graphite paddles should not get wet. Whereas a wooden paddle may be used wet or dry.

GRAPHITE POWDER: (Item) Used as a lubricate often in molds.

GREEN GOLDSTONE (SEE AVENTURINE GLASS)

GREENSTONE (SEE AVENTURINE GLASS)

GRINDER: (Equipment) A piece of equipment used to further refine the shape of the glass. It is used before the polisher. The grinder may be a belt or a horizontal or vertical wheel (disc). Often a diamond pad is used on the horizontal grinders. Grit is applied to the vertical grinders or is part of the belt. Silicon carbide is also used in some grinders.

GRINDING: (Action) The process of using a grinder to remove glass with an abrasive (grit or diamond pads). Glass is always ground while wet in order to avoid heat buildup, damage to the tools and/or cracking of the glass.

GUM-DROP VASE: (Item) A HGA name for a dome-like vase.

H

HAND BLOWN: (Term) A glass object that made by hand and not assisted by machinery nor shaped by molds.

HANGER (HANGER RING, PIPE HANGER): (Equipment) A device which is used to hang a punty or blowpipe vertically (glass side down) in order to allow the glass to cool or to act as an extra hand. The pipes are hung via a "hanger collar" on the punty or blowpipe which is near the handle. As an example, paperweights may be "hung" for 5 minutes in order to avoid picking up texture from the annealer.

HANGER RING (SEE HANGER)

HANGING AMPHORA BUD VASE: (Item) A HGA name for a miniature amphora vase with a handle that may be hanged or placed in a stand.

HARD GLASS: (Term) A jargon term for glass with a low Coefficient of Expansion (COE). The quintessential hard glass is borosilicate glass (COE of 33; **SEE BOROSILICATE GLASS**).

HEAT: (Term) There are at least three types of "heat": Ambient Heat, Conductive Heat and Radiant Heat.

- **AMBIENT HEAT** is the temperature of the surroundings (i.e. room temperature). Typical example of home ambient heat is 65-72 °F
- **CONDUCTIVE HEAT** is that which is transferred directly from one object to another. For instance, anything touching the furnace will get hot. This is caused by conductive heat
- **RADIANT HEAT** is the result of heat rays from a source (e.g. the sun, the furnace or molten glass gathers) being absorbed by another object

HEAT SHIELD: (Item, Action) Heat shield can be both a noun and a verb

(Noun) A wall-like wheeled structure about head-high usually placed to the left of the glory hole. The shield offers a respite from the intense heat from the glory hole.

(Verb) The act of placing something between the gaffer and the hot glass object to provide a barrier from the heat.

HES VASE: (Item) This is a vase modeled after the Egyptian vessel. It is a tall vase with a pinched waist, wide shoulders and flared lips. Hes vases were used in ancient Egyptian rituals for the pouring of liquids (often an offering to the gods) on behalf of the dead.

HEMISPHERE BOWL: (Item) A HGA name for a high-sided bowl which is one-half of a sphere with or without a foot. A round-type of bowl.

HGA (SEE HOT GLASS ALLEY)

HIGH-LIGHTERS SERIES: (Term) A grouping of glass objects (vases, cups, bowls, cups, urns, etc) made by HGA with neon-like strings of colored glass artistically placed onto the clear vessels. This series is made using cane in a non-traditional manner. The cane is random and has no definitive pattern. This series compliments its surroundings. Not too much or too little color; just the right amount for any room. The highlights (individual pieces of cane) in the art, line quality and the "neon-like" colors draws you in. Although good for any flowers the light airy design makes these pieces especially good for summer flowers. Please click on the Vase Determinator on the HGA website to learn more about vase selection.



HOCHSCHNITT (SEE RELIEF CUTTING)

HOT: (Term) The definition of "hot" is not defined, per se, and is relative to other objects. For instance, the core of the sun is approximately 27 million °F whereas the photosphere of the sun (typically considered the surface of the sun) is only 10,000 °F, which may be considered relatively cool compared to the core. The temperature in the furnace of hot glass shop is 2000-2200 °F (approximately 20% of the temperature of the surface of the sun), whereas the annealer is typically around 900 °F. Ray Bradbury in his book, *Fahrenheit 451*, felt that temperature was the ideal temperature to burn books. Water boils at 212 °F. Third degree (damage to the underlying skin; more than a blister) skin burns occur at one second at 160 °F, 30 seconds at 130 °F and 10 minutes at 120 °F (for this reason most hot water heaters are set at 120 °F or less). Needless to say, many things are greater than 120 °F in a hot glass shop and burns are common. Please be careful when you visit a hot glass shop. **ASSUME EVERYTHING IS HOT** even if it doesn't look hot.

HOT FINGERS (SEE FINGERS)

HOT FORMED (HOT WORKED): (Term) Name for a glass object that was shaped while it was hot.

HOT GLASS ALLEY, LLC (HGA): (Name) A USA limited-liability-corporation (LLC) which is involved in the hand-making of glass art. Hot Glass Alley, LLC sponsored this website, the Glassipedia, the Vase Determinator and makes the all art displayed in the photographs on this website (www.hotglassalley.com). All the glass art is handmade in the USA by glass artist, Jacob Pfeifer and his team.

HOT PLATE: (Equipment) Electrically heated plates used to preheat cane, frit, bits of color, bits, shards, murrini, etc in order to avoid a thermal shock when applied to an existing hot glass object.

HOT SHOP: (Term) A glass blowing studio consisting of a furnace, glory hole, annealer, benches, pipe warmers, a garage, pipe coolers, pipe hangers, marvers, etc. Most of the equipment mentioned in this Glassipedia are in the Hot Shop.

HOT SHOP BALLET: (Action) There is a "Ballet to the Process of Glassblowing". The interaction of the gaffer and assistant, trips to the glory hole and bench and the "lean". The "lean" would be "First Position" in the ballet and the "transfer" the "Second Position". The gaffer leans into the piece while at the bench in order to optimally visualize the details and manipulate the hot glass object. Words are not needed (thus, people who don't speak the same language may work well together). The visual clues are subtle but they are in the eyes, in the lips, in the hands, in a nod and most importantly in the hot glass art piece itself. Watch the gaffer and his/her assistant, image music and visual the choreographed dance as you watch the next piece being created during the heat, reheat, recovery and shape.

HOT WORKED (SEE HOT FORMED)

I

ICE GLASS (SEE CRACKLE)

ICTHAMMOL (BLACK SALVE, DRAWING-OUT SALVE): (Item)

Icthammol is ammonium bituminosulfonate obtained from oil shale. It is used to soften skin over an impalement of a foreign object (e.g. splinter of glass) to allow it to come to a "head" quicker. It appears that it is "drawing out" the object. It is used in 20% concentration and has mild local anti-bacterial properties.

IFB (INSULATING FIRE BRICK; SEE FIRE BRICK, INSULATING)

INCALMO (SEE ENCALMO)

INCLUSIONS: (Term) Name of metal, glass pieces, bubbles, etc that are placed within the glass object while it is hot for decoration.

INCOMPATIBLE GLASS (Term) The ability to fuse different pieces of glass together is determined (in the most part) by the Coefficient of Expansion (COE). The two pieces of glass are "incompatible" if fusion is not feasible without the risk of cracking the glass due to stress when cooling the final product. This is often due to the COEs being too different. In addition, there are many glass coatings (e.g., iridescent, dichroic, gold leaf, etc) which may contribute to the compatibility of the two pieces of glass. (**SEE COEFFICIENT OF EXPANSION**)

INTALGIO (TIEFSCHNITT) ENGRAVING: (Term) A type of engraving where the design is cut into the glass. Although this technique was known and used by the ancients, Caspar Lehmann refined the process in the 17th century. He was the gem cutter for Emperor Rudolf II of Prague. He used copper or bronze wheels to do the engraving. Tiefschnitt means deep cut.

IRIDESCENCE: (Term) A visual phenomenon of surfaces in which the color or hue change in correspondence to the angle in which the object is viewed. It is caused by multiple reflections from several transparent surfaces in which the reflected light is enhanced or damped because of interference of the light rays (wavelengths) from the two or more surfaces. This can occur with aging glass (decomposition) or be accomplished artificially (e.g. Tiffany Glass). Stannous chloride (**SEE STANNOUS CHLORIDE**) may be used to create an iridescence as well.

IRIDIZED GLASS: (Term) Glass whose surface is chemically treated to have an iridescent appearance. It often results in a "rainbow" reflection.

IRON (SEE PUNTY)

J

JACKS (BORSELLA, PUCELLA): (Tool) Jacks is an indispensable glass blowing metal (iron) tool that is hairpin-pincher-like and shaped like huge tongs or tweezers. They are used to manipulate the hot glass by shaping it, selectively cooling it and creating break points (**SEE JACK LINE**). They are available in different sizes and blade types. For instance, the blade may be like a knife's edge or rounded. Dino Tedeshi is supposed to make the best Jacks in the world and HGA is fortunate to have a pair. Jim Moore, Cutting Edge (Red Hot Metals) and Carlo Dona are other makers of fine jacks and various other tools. Glass blowers are very protective about their Jacks and have personal favorites caused by subtleness in spring and feel. Types of jacks include Parchoffi (**SEE PARCHOFFI**), graphite jacks, paper jacks and Teflon jacks.

JACK LINE: (Term) The place made by the jack on a hot glass object with the purpose of breaking off the piece from the punty or blowpipe (**SEE TRANSFER**). Drop of water are place on the glass (**SEE WETTING OFF**) with the tweezers (pincers) in the spot where the gaffer wishes to separate the hot glass object from the pipe. The rapid cooling weakens the glass at the point of the water and creates small fractures in the glass. Once the pipe is gently tapped the hot glass object will break off at the Jack Line. If a very good jack line is put in the piece then water is not needed.

JAPANESE FISHING FLOATS: (Item) Floats for fishing nets made in Japan. These floats were handmade by glassblowers. They often used recycled glass (such as old sake bottles), picked up, heated and blown on the blowpipe (often resulting in bubbles in the reused glass), removed from the blowpipe, sealed with a "button" of melted glass, a mark (Japanese writing) was placed close or on the sealing button for identification and finally the float was placed in the annealer. The sealing button is sometime confused with a punty mark. These floats supported large fishnets (sometimes 50 miles in length) adrift in the Pacific Ocean. They are no longer used by the Japanese fisherman but many are still afloat. The glass floats remaining in the ocean are in a circular pattern in the Pacific currents but storms will cause some of the floats to come ashore most commonly in Alaska, Western Shore of Canada, Washington State, Oregon and Taiwan. They are popular collectors' items. Replicas are common.

K

KANTHAL: (Item) A metal alloy of iron, chromium and aluminum. The alloy is heat-resistant and has intermediate electrical-resistance and is thus commonly used as heating elements in the glass art equipment.

KEVLAR MITTS (SEE GLOVES)

KILN: (Equipment) An insulated, temperature-controlled oven used for heating. A kiln will achieve temperature as high as 1500 °F (fusing temperature) whereas the peak temperature in an annealer is approximately 1000 °F. Kilns can be in the form of a chest (lid on the top) or a closet (door on the front). There are special types of kilns: Bell Kiln (**SEE BELL KILN**), Car Kiln (**SEE CAR KILN**) and Color Kiln/Oven (**SEE COLOR KILN/OVEN**).

KILN FORMING: (Action) The act of fusing, shaping and/or forming glass art using the kiln.

KILN WASH: (Item) A paint-like substance composed of 50% kaolin clay and 50% silica (alumina hydrate). The powder is mixed with water and painted on the ferro. The wet ferro is placed on the pastore and dried in the glory hole. Even drying is assured by rotating the ferro several times during the drying process (air dried and then heated once in the Glory Hole). The kiln wash is used to keep the fused cane from sticking to the ferro.

KNITTED GLASS: (Item) Glass art that incorporates the talents of knitting, lost-wax casting, molding making and kiln casting. It was invented by Carol Milne (<http://www.carolmilne.com/>) in 2006. The process involves several steps:

1. Knit an object in wax (no easy task)
2. Surround the wax with refractory material
3. Melt the wax out (leaving a shell of refractory material in the shape of the wax [this makes the mold]) → Lost Wax process (**SEE LOST WAX CASTING**)
4. Glass is then melted into the mold in the kiln
5. Finally the mold is removed (destroyed) leaving the knitted glass

KNOCK OFF TABLE: (Equipment) A table in which the hot glass art is literally knocked off the punty or blowpipe. It usually covered with FiberFrac (woven silica fabric) or Kevlar blanket to protect the object from thermal shock. A torch may or may not be used on the piece on the table to remove any sharp edges and then it is placed in the annealer via a gloved assistant. The alternative is to knock off the object into the gloved hands of the assistant or for the gaffer to knock off the piece directly into the annealer.

KNOP: (Term) a decorative round ball used in goblet stems.

KNURLING: (Term) A knurling is a glass band wrapped around a larger glass object.

KUGLER OVEN (SEE PICK-UP OVEN)

L

LADDLE (SEE SCOOP)

LAMPWORK (SEE FLAMEWORK)

LATHE: (Equipment) A horizontal wheel-like device used in copper wheel engraving or used for polishing. Unlike polishing wheels, the lathe wheels are coated with diamonds in order to cut the glass.

LATHE CUTTING: (Action) The act of finishing an object by holding the object against an abrasive surface in order to modify, trim, cut or polish the piece.

LATTICINO: (Item) Venetian cane with intricate (lacy) designs in the inside which is used to decorate the existing hot glass object. The threads of white or colored glass is encased within clear glass and pulled into cane again.

LEAD GLASS: (Item) A soft glass with a high refractive index that contains at least 20% lead oxide. The refractive index gives a brilliance to the object. Sometimes the glass is cut with facets to accent the brilliance.

LEADED GLASS: (Item) Stained glass held in place by lead comes (a slender grooved bar).

LEAF (FOIL): (Item) Thin sheets of metal (gold, silver or copper). The paper-thin sheets can be incorporated into the glass as it expands about the same rate as glass (compatibility). The leaf is often used to enhance or add decorations to the object.

LEAR (SEE ANNEALER)

LEER (SEE ANNEALER)

LEHR (SEE ANNEALER)

LID CALIPERS: (Tool) A specialized caliper used to measure the inside diameter of a jar or bottle and the outside diameter of the lid. This is done to ensure that the lid will fit into the jar/bottle well. It is an "X" shaped caliper with inward curving tips on end and outward curving tips on the other. The pivot point is equidistant from both ends.

LINE FORM: (Term) Flowers are divided into three major forms by florists (**SEE FLOWER FORM**). Flowers that form in a row (line) on the stem. They are often used in large floral arrangements to add color and texture. They help draw the eye from the edges down along the line to the center of the design. Examples are bell flower, calla lily, cockscomb, freesia, gladiolus, hyacinth, iris, larkspur, lily of the valley, orchid-cymbidium, orchid-dendrobium, orchid-phalaenopsis, orchid-vanda, rose, snapdragon, star of Bethlehem, sweet pea and tulip.

Linear Expansion Coefficient (LEC) (SEE COEFFICIENT OF EXPANSION)

LIP: (Term) the top edge of the piece.

LIP WRAP: (Item) A thin, often contrasting, circle of color added to the lip of the hot glass object. It is usually done right after the piece has been put onto the punty but before any of the final shaping.

LITTLE PUFFER (SEE SOFFIETTA)

LIULI: (Term) Liuli is ancient Chinese glass art. It was first noted in the 11th century BC. Tradition has that Liuli was first discovered by an alchemist (Lu Shen) attempting to make the Elixir of Life for his emperor. He showed the emperor the glass objects while they were still in the furnace and claimed that they would provide everlasting life. The impressed emperor embraced the concept and Liuli production began. It was used exclusively by Chinese royalty and thus it was seldom seen by the commoners. The raw materials are silicates with many metallic oxides. The glass was made into rods and then used to fashion the final glass piece while being reheated. The glass is much softer than traditional glass used in the hot glass shops of today's artists. However, the metal and the softness of the glass add to the bright vivid colors, allows for delicate shaping and intricate details. No molds are used and each piece was hand-crafted.

LOST MOULD (SEE LOST WAX CASTING)

LOST WAX CASTING (CIRE PERDUE, LOST MOULD): (Process) The act of modeling an object in wax, casing it in ceramic or plaster, melting the wax and pouring molten glass into the mold. An example of Lost Wax Casting is Knitted Glass (**SEE KNITTED GLASS**). Powdered glass may be used instead of molten glass and then powder is then melted in a kiln.

LOW BOWL: (Item) A HGA name for a shallow flat plate-like bowl with 1-2 inch side or lip.

LUMBER JACKS (SEE PACIOFFI)

M

MAESTRO: (Person) An Italian glass master. Lino Tagliapietra, Pino Signoretto, Davide Salvadori and Davide Fuin are all examples of Italian glass masters.

MANDREL: (Tool) A metal rod often used in flameworking around which a glass bead is formed. After annealing the piece the bead can be removed. The mandrel is usually coated with a material (bead release) prior to use to make the bead removal easier. The mandrel creates the hole for the bead.

MAPP GAS: (Item) MAPP stands for Methyl-Acetylene-Pro-Padiene. Because it lacks oxygen, it may be used for reducing colors (SEE REDUCING COLOR). Colors that reduce appear metallic shiny in appearance once reduced. The flame produces a temperature which is approximately 5000 °F that is may be used to keep the glass object and the punty hot. It can be focused on a small area if needed but it will leave a residue if used too long in one place.

MARK SERIES: (Term) HGA verbiage for a series of glass art objects (e.g. vases, bowls, paperweights) made in a variety of colors. This series is backed in white (inside), has a white lip and white accents of color. This series has the playfulness coming out. The color represents the warm and cheerful colors of crayons and the marks (individual pieces of cane) represent the playfulness of a child's markings; the lines are random and unique. These pieces will leave an accent Mark in any room. Although good for any flowers the bright colors makes these pieces especially nice for spring flowers. Please click on the Vase Determinator on the HGA website to learn more about vase selection.



MARVER: (Equipment) A large flat table in which the gather is rolled to give shape and remove some heat. The table used to be made of marble (in fact, marver means marble in French). However, the marble tended to crack and need replacement. Today stainless steel is used for most marvers. Rolling the gather at different angles is needed to form the cylinder or cone shape needed to begin the manipulation. Graphite marvers are also available. The marver may be mounted at an angle or may be adjustable to make an angle for ease of use. Some marvers even have hydraulics. There are several types of

specialized marvers including: Cane (**SEE CANE MARVER**) and Diamond (**SEE DIAMOND MARVER**).

MASHING PLIERS (SEE CRIMPS)

MELT: (Term) the molten glass produced by melting the batch or cullet.

MERLETTO GLASS: (Term) Merletto glass art consists of a network of latticino (**SEE LATTICINO**) (opaque white glass threads) forming a lace-like pattern. Merletto glass art often uses Fin Molds. (**SEE FIN MOLD**)

MERESE: (Item) A connecting piece used in Venetian goblets. It is shaped like a disc.

MEZZOSTAMPO: (Process) The act of putting a new gather over the base of a bubble so that the sides are covered in a "ring" of new glass. Then the piece is placed into a mold so that only the ring is surface molded. Finally the piece is then blown and shaped as in the usual manner. Mezzostampo means "half stamped" in Italian.

MILLEFIORI: (Term) Italian for "Thousand Flowers". Slices of cane cut like thick coins are used to decorate hot glass objects by embedding/melting the millefiori into the piece. Part of the Venetian glass style.

MINNOW TRAP: (Item) A part of the American Indian Fine Art Series by HGA. The glass art piece is a replica of minnow traps used by ancient American Indians. The traps were often made from river cane. They had a wide mouth entry point which narrows to a smaller opening before body of the trap. Once the minnow is in the body of the trap they seldom swim back out the way they came in (minnows are not very smart). These traps did not require bait and could be placed on the bottom of streams or rivers. Long twine or rope were usually attached to the trap for easier retrieval. Some of the traps were ornately decorated.

MITTS (SEE GLOVES)

MOLD(S): (Item) Molds are used to give the glass a surface pattern (**SEE OPTIC MOLD, SEE PINEAPPLE MOLD**) or a specific shape (**SEE FOOTING TOOL**). Molds are made metal, plaster, clay or wood. They can be used wet (e.g. wood molds) or dry (e.g. plaster molds). Wooden molds are often made from hard fruit trees (e.g. cherry). It is common to use a wooden mold to provide the primary shape for paperweights and in some cases for vessels. Types of molds include:

- Blow Mold (**SEE BLOW MOLD**)
- Dip (**SEE PATTERN MOLD**)
- Fin (**SEE FIN MOLD**)
- Footing Tool (**SEE FOOTING TOOL**)
- Optic (**SEE OPTIC MOLD**)
- Paste (**SEE PASTE MOLD**)
- Pattern (**SEE PATTERN MOLD**)
- Piece Mold (**SEE PIECE MOLD**)

- Pineapple (**SEE PINEAPPLE MOLD**)
- Sand Mold (**SEE SAND MOLD CASTING**)
- Two-Part Mold (**SEE TWO-PART MOLD**)
- Waste Mold (**SEE WASTE MOLD CASTING**)

MOLD BLOWN: (Term) Mold blown may refer to one of two processes.

- Mold blown may refer to a piece of glass art that has had the surface affected by a mold. Typically the glass is blown into the open part of a vertical mold to give texture to the surface of the piece. Then the hot glass is shaped into the final object by the artist.
- The term can also refer to molds to make the shape of the glass vessel. Machine made glass is made this way as well as some hand-made glass such as Blenko Glass.

MOLD PRESSED (SEE PRESSED GLASS)

MOILE: (Term) The glob of molten glass on the end of the blowpipe or punty before it has been shaped. It acts as the anchor for the whole piece and is very important.

MOILE WRAP: (Term) A wrap of molten glass placed around the moile to keep it from breaking and adds heat back to the moile.

MOSAIC GLASS: (Term) Taking small pieces of cut glass (often sheet glass) to make a picture. The pieces are assembled using grout to set in place.

MUD (SEE WAX)

MUFFLE: (Equipment) A small furnace for preheating and garaging objects for use later.

MURRINE (MURRINI): (Item) Cane cut in cross sections (like coins) to reveal the integrate and often delicate patterns within the cane. The coin like glass objects are preheated and melted into the large glass object being made. The murrine offer unique decorations to the final piece. It is thought that the term comes from the Latin word, murra. Murra was the stone that Roman Stone Vasa Murrina vessels were made.

MURRINE CUTTER: (Equipment) A device that is air driven or manually done with a hand wheel) to provide a quick and precise cut of the murrine cane in order to produce uniform sized wafers for use. It helps keep the loss to a minimum and avoids "sharding" the rod.

MURRINI (SEE MURRINE)

MURRINI CUTTER (SEE MURRINE CUTTER)

N

NECKING: (Action) The act of forming a bottle neck in the hot glass object. There are pulled necks and dropped necks.

NEON: (Item) Some inert gasses will emit colored light when charged with electricity. Neon is such a gas and it emits a red light; whereas, xenon emits a blue light. Glass artists will create tube-like art with a vacuum and the inert gas. Then arrange the tubes in the final display and electrically charge the tubes to release the colored light. The process is called "Neon Lighting" regardless of the gasses used and the colors emitted. Wayne Stratman and Sally Prasch are both well known for their glass neon art.

NEWSPAPER (SEE RAG)

NICHROME: (Item) Nickel-Chromium Alloy, 60% Nickel, 16% Chromium (Balance Iron). A metal wire used for heating elements. The advantage of the wire is that it can withstand the extreme heat without oxidizing or melting. The amount of the wire (thickness and the coil density) and the current supplied determines the wattage needed and heat produced. It is compatible with glass and can be placed into a hot glass object for use later (e.g. hanging the piece).

O

OPTIC MOLD: (Tool) The Optic Mold is a bronze, steel or aluminum mold that is used to put even-spaced patterns (e.g. ridges, indentations) on the surface of the hot glass art being formed. The molten glass is typically blown into the mold in a vertical position. It is important not to allow the bottom to get too thin or thick. There are available in many configurations. Open bottom optic molds are used to allow cane pickups. The cane is carefully arranged in the mold prior to the bubble is blown into the mold. Closed bottom molds are typically used for the optic pattern they produce on the surface.

ORNAMENT HOLDER (BOWL, POCKET, SCOOP): (Tool) The device used to hold the hot ornament when applying the glass loop (needed for hanging the ornament). The hot ornament is cracked off the pipe onto the ornament holder where a hot bit can be added. The hot bit is often shaped by tweezers to complete the loop. If a scoop is used then the ornament with the loop can be rolled into the annealer. If another form of the holder is used the loop serves as a convenient manner for carrying the ornament to the annealer. Frax pockets, Kevlar pockets and pre-heated coffee cans can be used as well.

OVE GLOVE: (Item) Ove Gloves are commercially made by the Joseph Enterprises company and are made of Kevlar. They withstand temperatures up to 540 °F. Thus, it cannot be used to touch hot glass (often in the 1100 °F range) but will help protect from radiant heat.

OVERLAY: (Term) The new layer of hot glass placed over an existing hot bubble. It is both an noun (the layer itself) and a verb (the act of placing the new layer on the existing piece). The new layer may be clear or colored.

OVERMITT: (Item) Mitten shaped gloves that fit over the Kevlar gloves. These add extra insulation when dealing with the hot glass and protect the Kevlar gloves.

OVERSHOT GLASS (ANGLO-VENETIAN GLASS, VENETIAN FROSTED GLASS): (Term) Glass with a decorative surface made by rolling the near-final hot glass art object over a finely ground shards of glass (on the marver) to coat the surface. The piece is then lightly reheated to remove sharp edges. The final piece has a frosted but rough appearance. It was first used in Venice in the 16th Century. **SEE CRACKLE GLASS** as it is sometimes confused as Overshot Glass but they are very different processes.

OXYGEN GENERATOR CONCENTRATOR: (Equipment) A device to contrite oxygen from either water or room-air. In the room-air type (the one most typically used by hot shop studios) chemicals (zeolite pellets) absorb nitrogen from the air. Typically room-air is composed of 78% nitrogen and 21% oxygen. The oxygen generator concentrator results in an oxygen content of greater than 90%.

P

PACIOFFI (SEE PARCHOFFI)

PADDLES: (Tool) There are various types of paddles and they serve multiple functions but the two main functions are (1) to shield a gaffer from the heat of the molten glass and (2) to flatten the bottom or lip of piece while making certain that it is perpendicular in orientation to the body of the work. Most paddles are made from fruit wood (e.g. cherry) but may be made from graphite or even metal. Paddle types include:

- Battledore (**SEE BATTLEDORE**)
- Cork (**SEE CORK PADDLE**)
- Graphite (**SEE GRAPHITE PADDLE**)
- Tagliol (**SEE TAGLIOL**)
- Wood

PAPER MARVERING: (Action) Sometimes a gaffer will wish to marver (roll the gather on a table) on wet newspaper rather than a bare steel table. The wet newspaper offers several advantages including the fact that it is not as cold as the table, it removes less hear from the glass and there is less friction allowing the gaffer to move more easily across the surface. The wet paper is usually no more than two or three layers thick and lie upon the steel marver.

PAPER SCUM: (Term) "Paper Scum" is the mark newspaper ash residue leaves on the glass object.

PARCHOFFI (LUMBER JACKS, PACIOFFI, ROD TONGS): (Tool) Solid wooden or wooden tipped jacks that are often used to “open up” large pieces. The concept of wooden water-soaked jacks is that they will not leave marks on the hot glass piece like a metal jack may. These tools are excellent for making bowls.

PARISON: (Term) The first small bubble from the first gather is called the parison.

PASTE MOLD: (Item) A metal mold that has been lined with a baked on compound or wet Frax. This lining offers a softer surface than the metal, may be soaked in water and is more durable than wood.

PASTORALE (PASTORALI, PASTORALLI): (Tool) A large metal flat plate with a long handle. It is used to heat and slightly melt cane or murrini together (tack-fuse) together in order to enable the gaffer to pick up the entire series of cane or murrini as a single piece on the hot glass art being shaped. The cane is placed on the flat plate, called the Ferro (**SEE FERRO**), with metal bars (**SEE FERRITI**) on either side of the cane to keep them from rolling off the Ferro. The entire plate is then gently heated in the glory hole in order to accomplish the tack-fuse.

PASTORALE KILN: (Equipment) The Pastorale Kiln is a specialized kiln exclusively made by Ohm Equipment (<http://www.ohmequipment.com>) to aid the glass artist in making Venetian Art involving cane, murrini and other pick-up pieces. It preheats the pieces to be attached to the hot glass art and then via a foot pedal opens and delivers on a shelf the pieces for pick up. HGA obtained one of the first Pastorale Kilns made by Doug Ohm.

PASTORALI (SEE PASTORALE)

PASTORALLI (SEE PASTORALE)

PATE DE VERRE: (Action) The act of creating a solid glass object by fusing glass powder/frit brushed onto a mold. It is a French term meaning “glass paste”. The glass powder or frit is brushed or tamped onto a mold and then fused in a kiln. It literally means to “paint with glass”. The final products are often stunning and look very realistic. Erika Tada is a master of this technique.

PATTERN MOLD (DIP MOLD): (Tool) A vertical and usually cylindrical-tapered with an open-top mold with a pattern on the internal surface. The molten glass is placed into the mold and then inflated to produce a surface pattern for the glass art object. Examples would be the Optic mold (**SEE OPTIC MOLD**) and the Pineapple mold (**SEE PINEAPPLE MOLD**).

PEGGING: (Action) Pegging is the act of placing a parison into a gathering pit.

PHOTOSENSITIVE GLASS: (Term) Glass composed of silver or gold lithium-silicate may have an image captured when it is exposed to ultraviolet light. The ultraviolet light causes an electron to change orbit and thus changes the physical properties of the

glass exposed. Photosensitive glass was discovered by S. Donald Stookey in 1937 at Corning. The latent image is only formed when the gold or silver particles are exposed to the 280-320 nm wavelengths (ultraviolet) and then "heat developed". The entire process is a multi-step procedure. First the hot glass art object is formed with the specialized gold or silver glass and annealed. After cooling a mask or template is placed onto the object and exposed to ultraviolet light. After exposure the piece is reheated in the annealer to approximately 900 °F for silver or 1000 °F for gold. After 3-4 hours at the required temperature the latent image is "developed and fixed". The final product has a three dimensional appearance. Although discovered in 1937 the patent was not obtained until 10 years later. This is because the photosensitive glass was used in World War II to send messages. A person would receive what appeared to be an ordinary piece of glass but it was in fact photosensitive glass. The person receiving the glass would reheat the glass to discover the latent (hidden) message. The latent image may be words, designs or even photographs. The final image is part of the glass itself (not merely on the surface) it will last as long as the glass will last and therefore is one of the most durable methods to capture an image. Luke Jacomb is a glass artist who uses and is well known for his fine art with this technique.

PICK: (Tool) A thin shaft of sharp-pointed metal (often titanium) that is either straight or bent at a right angle near the end. It is used to make small holes or to create the feathering technique. Many picks have a wooden handle on one end.

PICK UP: (Action, Term) As a verb (action), to "pick up" means to acquire a new piece of glass onto the existing hot glass art object. As a noun (term), a "pick-up" is an approximately 1x1" piece of colored glass encased with clear glass. The "pick-up" is "picked up" and embedded into the existing hot glass object (such as cane pick-up).

PICK-UP DECORATION: (Action) The technique of adding color to an existing hot glass object by "picking up" a pre-heated piece to be embedded or added to the surface. Then the new object is blown out further to add to the decoration overall impact. The inclusion is usually cased over with clear glass.

PICK-UP OVEN (KUGLER OVEN): (Equipment) A small oven used to preheat pieces to be added/embedded to the existing hot glass object. Often the pieces are of color and Kugler is a popular brand of color (hence the jargon name: "Kugler Oven"). However, Gaffer Glass and Reichenbach also make pick-up ovens.

PI DIVIDER: (Tool) the pi divider is a mechanical device with curved arms on one end and straight arms on the other side of the pivot point. This device is used to estimate the diameter necessary for the hot glass vessel or collar to be in order to exactly pick up a series of cane of murrini. The cane is placed on a flat plate (**SEE PASTORALE**), fused together and then measured with the pi divider by straight end. The curved end of the pi divider determines the necessary diameter for the glass gather to have in order for the first and last cane piece to meet exactly when rolled onto the gather.

PIECE OF THE BEACH SERIES: (Term) A HGA name for a series of bowls representing the beach. The bowl itself is wavy like the ocean, ocean blue in color and has bubbles and dark areas (again like sea waves). In the bowl is beach sand and sitting on the beach sand is Faux Sea Glass (**SEE SEA GLASS**) and small sea shells. In the center of the

sand is a small container of alcohol-based gel that requires no ventilation and thus may be used indoors or outdoors. The sand and the fire signify the glass. Once lit, the bowl and faux sea glass radiate the reflection and appear to glow at night. Some individuals prefer to use a votive candle instead of the alcohol-based gel.

PIECE MOLD: (Tool) A mold which may be used more than once. It is the opposite of a waste mold (**SEE WASTE MOLD**) in which the mold is only used a single time.

PILL VASE: (Term) A HGA name for a series of vases that are shaped like flattened spheres.

PINCERS (SEE TWEEZERS)

PINCHED URN: (Item) An urn with a pinched waist and a small opening at the top.

PINEAPPLE MOLD: (Tool) A pattern or dip mold used to create a diamond-like effect on the surface of the hot glass. The final result is to give the surface a texture similar to that of a pineapple.

PIPE (SEE BLOWPIPE)

PIPE BRUSH: (Tool) A thin brush used on the inside of a blow pipe to decrease scale (**SEE SCALE**).

PIPE COOLER: (Tool) A tool used to cool the hot blow pipe. Several methods exist including wet newspaper, a V-shaped box with holes in the bottom or a mechanical device made specifically for the purpose of cooling the pipe. Pipes are cooled from the handle toward the molten glass. The V-shaped box has a notch on the bottom (where the holes are) in which to rest on the pipe. The pipe is placed over the barrel of water, the box is filled with water from the barrel and then rested on the pipe as the water runs out, around the pipe and back into the barrel. The mechanical type is driven by a foot peddle and shots a gentile stream of water up to cool the pipe.

PIPE HANGER (SEE HANGER)

PIPE HEATER (SEE PIPE WARMER)

PIPE SPIT (SEE SCALE)

PIPE WARMER (PIPE HEATER): (Equipment) The pipe warmer is a small oven used to preheat the blowpipes and punties. Blowpipes and punties need to be preheated in order for the molten glass to adhere to the steel (hot glass does not stick to cold steel). The pipe warmer is used for this purpose. Although, sometimes this is

accomplished by a small area built into the side of the glory hole. Often the gaffer will have multiple pipes and punties in the warmer at any single time.

POCKET (SEE ORNAMENT HOLDER)

POLARISCOPE: (Tool) In order to visualize stress lines in glass polarized light is utilized. The polariscope is a pair of polarizing filters used for this purpose. The stress lines are invisible with normal light but show as colored bands with the polarized light. Glass which has a uniform Coefficient of Expansion (COE; **SEE COEFFICIENT OF EXPANSION**) and have been annealed properly will not show these colored bands.

POLE TURNER: (Person) An assistant who “muscles” an heavy hot glass art piece. He/she is able to turn, left and leverage the piece for the gaffer.

POLISHER: (Equipment) A piece of equipment (usually a wheel, belt or disk) used for making the final finish on the glass art piece. This is part of the cold working process. Polishing is usually done with felt wheels and fine abrasives such as cerium oxide or pumice. Glass is always cold worked wet to avoid heating and cracking the glass. When the polishing and buffing is completed it should leave a bright clear luster to the art object. A special type of polisher is called the reciprolap (**SEE RECIPROLAP**).

PONTIL (SEE PUNTY)

PONTIL MARK (SEE PUNTY MARK)

POT (SEE CRUCIBLE)

POT DROP (SEE POT MELT)

POT FURNACE (SEE FURNACE)

POT MELT (POT DROP): (Process) The process of creating unique glass by placing scrap glass into a clay flower pot, heating it to a temperature of 1700 °F in the kiln and then allowing the glass to “drop”, drizzle or leak out of the hole in the bottom of the clay pot. The glass can then be picked up on a blowpipe or used in layering designs to create the art.

POWDER: (Item) Colored glass can be used in several forms. Large thin pieces are often called shards, small bits of glass are often called frit and very fine glass particles are called “powder”. It is often used to evenly coat a piece of glass with the desired colored but it can also be used to ad gradation and fading. It is very dangerous to inhale and may lead to silicosis (**SEE SILICOSIS**). Therefore it is commonly used in a powder booth.

POWDER BOOTH (POWDER CUP, POWDER BOX): (Equipment) Powder booth is big box chamber with an exhaust ventilation to remove airborne glass powder and prevent inhalation. After rolling the glass in the powder it is removed from the booth for further shaping.

POWDER BOX (SEE POWDER BOOTH)

POWDER CUP (SEE POWDER BOOTH)

POWER (SEE BATCH)

PRESSED GLASS (MOLD PRESSED): (Term) Glass objects made by pressing molten glass in a metal mold and a metal plunger. The metal mold gives the outside of the glass object its overall shape and surface texture whereas the metal plunger gives the inside of the object its opening and surface texture. Thus, the inside and outside part of the glass object may have different surface textures. Many factories use this technique to make plates, bowls, tea cups, etc)

PRUNT: (Item) A prunt is a bit of hot glass that has been stamped with a pattern or blown to a shape. It is fused onto the glass art piece.

PUCELLA (SEE JACKS)

PUFFER (SEE SOFFIETTA)

PUNT: (Term) The punt is the indentation found at the bottom of many wine bottles. For the wine drinker it often signified a good quality of the bottle because it would allow sediments to collect at the bottom around the indentation and add strength to the bottle (especially important for highly effervescent wines such as Champaign). From the glass artist point of view the punt offers several advantages including:

- When the glass art piece is broken free from the punty, the bit of glass left behind (**SEE PUNTY MARK**) will be located up inside the punt
- The piece will sit flat on the rim of the bottom
- The bottom is less likely to "pull out" when finishing the glass art

PUNTING IRON (SEE PUNTY)

PUNTY: (Item) A small amount of hot glass on the end of a rod used to transfer the glass art object from the blowpipe to the punty rod. The glass object is then further shaped while on the punty rod. The punty may also be used to bring glass bits (often colored) to the hot glass object. The punty is typically 54 inches long and ranges in diameter. When the glass object is broken free from the punty, the bit of glass left behind is called the punty mark (**SEE PUNTY MARK**). There are different type of punties depending on what is being made: sculpture punty, dome punty, goblet punty, claw punty, doughnut punty, crown punty, blow punty and cross punty.

PUNTY MARK (PONTIL MARK): (Term) The pieces of glass left behind from the punty gather when the glass art object is broken free from the punty. This mark is usually polished out. The punty mark may be fired polished or cold worked.

PUNTY ROD (BLOW IRON, BIT IRON, IRON, PONTIL, PUNTING IRON, PUNTY ROD, SPIKE): (Tool) A solid steel or iron rod that is used to hold the punty. There are different types of punty rods such as counter-weight punty rod and step-down punty rod.

PURPLE PEEPER: (Item) A solid state electronic flame detector. It senses ultraviolet radiation produced by combustion of gas, oil, coal or other fuels.

PYREX: (Term) A name brand of borosilicate glass used by lampworkers. Some cookware is made with Pyrex Glass.

PYROMETER: (Equipment) A high temperature capability thermometer used to measure temperatures in the furnace, glory hole and kiln.

Q

R

RADIATION RECUPERATOR (SEE RECUPERATOR)

RAG (NEWSPAPER, WET NEWSPAPER): (Tool) Layers of wet newspaper and used as a shaping pad by the gaffer. It offers not only direct control of the shape but also cools the molten glass while shaping (helping the object maintain its form). While, it is probably the least expensive tool used in the hot glass shop, it is the closest time the gaffer will come to touching the glass with his/her hand. Only the black and white sheets of the newspaper are used as slick sheets, glossy sheets and color sheets have additional chemicals which the artist does not want to transfer to the glass art object. There is a bit of history, superstition and tradition about the "rag". Some artists claim that the Wall Street Journal and the New York Times use a better grade of paper and thus are preferred over other papers. The proper folding of the paper is also of crucial importance.

RATS NEST MATERIAL: (Item) Packing material that has been used so much that it has lost its packing qualities and is only good for making a nest for a rat.

REACTIVE GLASS: (Term) When glass with different metallic chemistry interacts at the interface may produce a different/new color (often red, black or brown). This is called "reactive glass". Hot glass, fusing and lampwork all use these properties to enhance the art objects.

RECIPROLAP: (Equipment) A device that helps semi-automate the grinding or polishing the bottom of a glass art piece. Each glass art piece has a rubber ring it which is then placed on a plate that rotates. The plate has various abrasive grits, diamond pieces or cerium oxide. The horizontal disk is off center and the pieces turn as they touch the padded edge of the device while it turns.

RECUPERATOR (RADIATION RECUPERATOR): (Equipment) A high temperature heat exchanger that recovers heat from the waste gas exiting a furnace and transferring the heat to the air feeding the burners. This saves energy (an average of 35% and as high as 75%) and thus reduces the cost of operation.

REDUCING COLOR: (Term) Some glass colors will change if they are exposed to a flame poor in oxygen (reducing flame). This can be accomplished by placing dry newspaper in the glory hole and "robbing" the flame of oxygen as the newspaper burns or by changing the gas mixture (poor oxygen flame). Typically a reduced color will have a very metallic or silver appearance.

REFRACTORY: (Term) A material that can withstand the high temperatures needed to melt glass is termed to be "refractory". Clay and ceramic fiber are commonly used refractory materials.

REGULATOR: (Item) A mechanical device used to control gas pressure. The device uses springs and valves to control the pressure and to deliver the gas. For instance, oxygen may be stored at 2000 psi but used at a low pressure of 10-20 psi.

REHEAT: (Action) The process of heating the glass back to a molten state via the glory hole or with a torch.

REHEATING CHAMBER (SEE GLORY HOLE)

RELAY: (Item) An electrical device for controlling the power in a circuit

RELIEF CUTTING (HOCHSCHNITT) (Action) The action of using a bronze or copper wheel with diamonds to remove the background glass and leave a pattern. Hochschnitt means high cut.

RETICELLO (VETRO A RETICELLO): (Term) The technique of merging two cane networks twisted in opposite directions creating a net like appearance. Each diamond shaped by the crossing cane contains a small air bubble. The small bubble results in a slight low spot between the two cane pieces as they cross. In Italian, vetro a reticello means "glass with a small network". It looks like a fishnet when completed. It is considered one of the most time consuming and technically difficult Venetian glass techniques.



REVERSE AMPHORA: (Term) A HGA term for an amphora with a short neck. The neck may or may not be flared.

RIBBON BURNER: (Item) There are two types of ribbon burners:

- A block of refractory material with 20 or more holes set in the side of the glory hole. Most furnaces use a blast burner with gas and air entering at a high velocity (resulting in significant noise), whereas a ribbon burner is quieter (lower velocity flame) and a more even heat. However, some gaffers prefer the blast burner because of the torch effect.
- A series of holes in pipe to fuel a series of flames. This is used in lampworking to heat a long section of glass tubing for bending and working.

Also **SEE CAN BURNER**

ROCKS GLASSES: (Term) An HGA term for a standard glass used often for cocktails and drinks.

ROD (BAR): (Item) Rods are solid/cylindrical forms of glass (usually solid colors) that are used in forming frit and/or powder. The solid colored rods are often cut into 1 inch or smaller pieces with a "rod cutter" for use as needed.

ROD CUTTER: (Equipment) A device used to cut a color rod into useable chunks of glass (usually ½ to 1 inch in length). It looks like a paper cutter or guillotine but is much more durable.

ROD TONGS (SEE PACIOFFI)

ROLLERS: (Equipment) Rollers are a set of wheels which allow the blowpipe to be turned without rolling it along the arms of the bench. The rollers may be on a separate stand or on the end of the bench arms.

RONDELLE (ROUNDEL): (Term) A flat plate/platter piece of glass that was created by spinning a glass bubble rapidly while it is very hot. Initially window glass was made by this method.

ROUND BOTTLE VASE: (Term) An HGA term for a pulled neck vase with a round bottom.

ROUND BOWL: (Term) An HGA term for a bowl that is basically two-thirds of a sphere with no straight sides.

ROUND FORM: (Term) Flowers are divided into three major forms by florists (**SEE FLOWER FORM**). Flowers that are round, circular forms (Round Form) are the focus of most arrangements. They are the stars of the design because the eye is automatically drawn to them. Examples are Allium, Amaryllis, Anemones, Billy Button, Carnation, Chrysanthemum, Cockscomb, Cosmos, Cymbidium Orchid, Daffodil, Dahlia, Freesia, Gardenia, Daisy, Hydrangea, Iris, Lily, Peony, Phalaenopsis Orchid, Pincushion, Ranunculus, Rose, Star of Bethlehem, Sunflower, Tulip and Vanda Orchid.

ROUNDEL (SEE RONDELLE)

S

SABOT: (Item) A cup covered with soft refractory material used to hold a hot glass bottle or vessel for shaping and refining.

SAFETY GLASSES: (Equipment) Eye safety from the ultraviolet light, the intense infrared light and glass shards are crucial to every glassblower be he/she the gaffer or the assistant. Many glassblowers use AUR-99 lens from Mike Aurelius: <http://www.auralens.net/c/22/aur-99>. These lenses are green in color and afford excellent infrared and ultraviolet protection. They do not offer sodium flare protection and thus, the lenses are not designed for use by lampworkers. Clip-ons are often used by the glassblowers. So the green "sunglasses" are not that glassblowers are trying to "look cool" but it is all about protecting their eyes.

SAFETY SHOWER AND EYE WASHES: (Equipment) With the heat and chemicals associated with glass blowing occasionally accidents happen. Burns may occur, clothing can catch fire, hair can catch fire, shards of glass can get into the eyes, etc. Eye washes and safety showers are emergency systems used to protect hot glass artists from injury in case of contact with hazardous chemicals, chemical compounds or fire. Proper use of this equipment lessens the chances of permanent or severe injury. Almost all hot shops have these available on the premises. Obviously, a first aid kit, fire extinguishers and fire blankets are also crucial.

SAFETY SYSTEM: (Equipment) Safety systems are a necessity in the modern hot glass studio. They will shut off the combustion train if a fault is detected in which there gas pressure is too high or the gas pressure is too low or if the flame goes out.

SANDBLASTER: (Person) The glass artist doing the sandblasting to a piece of glass art.

SANDBLASTING: (Action) By using high-pressure air and sand mixture layers of glass may be removed from a cooled piece of glass. Depending on the power (psi) of the blasting thick or thin layers may be removed or even carved into the glass object. The process leaves the glass with a cloudy dull finish. Occasionally artist will use a substance such as Liquid-Luster, Pledge or Armor-All applied to the sandblasted area to give the matte-finish a "wet look". Sometimes the blasting is used to reveal colors below the surface color. There are two major types of sandblasters: the siphon sandblaster and the pressure sandblaster. The siphon sandblaster has a reservoir of abrasive material (sand) that is vacuum sucked into the air stream a couple of inches from the nozzle of the hand gun. Whereas the pressure sandblaster has a pressurized hopper of abrasive material (sand) that is forced out the gun nozzle via a long hose. The advantage of the siphon sandblaster is cost (less), control and easy maintenance. However the system is not as powerful as the pressure sandblaster making deep carving long and laborious.

SAND MOLD CASTING: (Technique) The process of casting glass into a mold made from sand. Obviously each mold is used only once.

SATIN GLASS: (Term) Acid applied to a cooled glass surface results in a matte-finish or cloudy dull finish to the glass. This glass is called "Satin Glass".

SAWING: (Action) The process of cutting glass with a rotating, diamond-tipped, wheel blade is called "Sawing".

SCALE (PIPE SPIT): (Item) The inside of the blow pipe will start to burn when temperatures get greater than 1,200 °F. This oxidized material may flake off and end up in the hot glass object. Once it is formed within the pipe the head is often needed to be replaced or thoroughly and frequently cleaned out.

SCALLOP/JEWEL BOWL: (Term) An HGA term for a small ruffled edge bowl.

SCAVO: (Process) Scavo is the process of adding a corrosive chemical to the surface hot glass will result in matte finish. This is done to the hot glass while it is cooling whereas a matte finished is achieved in sandblasting (**SEE SANDBLASTING**) and acid application (**SEE SATIN GLASS**) with cooled glass.

SCOOP (LADDLE): (Tool) There are two definitions for "Scoop":

1. (**SEE ORNAMENT HOLDER**)
2. A tool used to remove (scoop-out) the last glass before turning the furnace off. This glass must be removed because when the furnace is turned back on the glass expands quicker than the pot and may cause the pot to crack. The scoop is typically dipped in water (cooling it) before the glass is removed from the furnace.

SCULPTING: (Term) Sculpting is free forming hot molten glass to make the desired shape of the final object. It is different than glass blowing.

SEA GLASS (BEACH GLASS, FAUX SEA GLASS): (Term) Frosted appearing glass that has been “weathered” with rounded edges. Sea glass is naturally made when shards of broken glass from a variety of sources (including shipwrecks) are plummeted, rolled and tumbled in the ocean (or lakes) for years (sometimes decades) until the edges are smoothed and rounded and the flat parts of the glass has a frosted appearance. Sea glass can also be made artificially by using a rock tumbler. HGA calls this latter form of sea glass, “Faux Sea Glass”. Natural sea glass is increasingly rare and expensive. Sea glass may be used a variety of ways including jewelry, decorations, ballast for clear vases and as an enhancement to the HGA “Piece of the Beach” series.

SEEDS: (Term) “Seeds” are a collection/group of small air bubbles of gas within the glass object or in the glass in the furnace.

SHAFT COLLAR: (Item) The “shaft collar” is a thick ring (typically $\frac{3}{8}$ to $\frac{1}{2}$ inch in length) with a set screw which is placed on the pipe or punty rod. The set screw allows the ring to be slide up or down the rod to the desired location and then “locked” in place. It allows the rod to be hung until needed for the glass art object. Come in steel or zinc.

SHARD: (Term) A “shard” is a glass fragment. It is larger than frit. It may be used in the hot glass art object by melting it into the piece. Since different colors melt at different temperature, the artist may use shards of colored glass to not only add color but also texture to the piece.

SHEARS (GLASSMAKER’S SCISSORS): (Tool) Tip-snip-like tools used to cut, shape and trim hot glass are called “shears”. The glass shears have a thin sharp edge whereas a tin-snip has a blunt shearing edge. Shears are sometimes called the “Glassmaker’s Scissors”. There are several types of shears including:

- Diamond (**SEE DIAMOND SHEARS**)
- Duckbill (**SEE DUCKBILL SHEARS**)
- Straight (**SEE STRAIGHT SHEARS**)

SHIELD: (Action, Tool)

Verb: The act of protecting the gaffer from the heat of the glass art object or from the glory hole

Noun: A wooden paddle held by the assistant to protect the gaffer from the heat of the hot glass object is a type of shield. Kevlar sleeves are occasionally used by gaffers. Also a shield is used to protect the glass blower from the heat of the glory hole. These shields are often on stands and help control the ventilation as well. Most benches have a leg shield for the gaffer.

SHOT GLASSES: (Term) A shot glass is a small vessel designed to hold a measure of an alcoholic beverage. HGA makes a variety of shot glasses in various colors. Custom orders to match school colors are available. Shots, shooters, jiggers and fingers are all terms used to measure alcohol volume. Typically:

- A small shot glass is 1 ounce = 30 ml = 2 tablespoons = 6 teaspoons = 1 finger
- A single shot glass is 1.5 ounces = 44 ml = a little less than 3 tablespoons = a little less than 9 teaspoons = 2 fingers = 1 jigger
- A double shot glass is 3 ounces = 89 ml = nearly 6 tablespoons = nearly 18 teaspoons = 4 fingers

➤ A shooter is a term for an alcoholic mixed drink of one ounce with two or more spirits. Before prohibition the shot glass had a thin wall and a thin base. After prohibition the character of the shot glass morphed to a thick wall and thick base. The origin of "shot glass" is interesting and varied, including:

- The word "shot" also means "dose" or "small amount" and the term "shot glass" may simply come from the fact that the glass holds only a small amount of liquid.
- In the old west the story goes that cowboys would trade a cartridge (bullet, casing, primer and powder) for a small amount of whiskey.
- When quill pens were used they would be placed in a small ink-well glass filled with lead-shot. The lead-shot would help give ballast to the glass and also hold the quill pen in an upright position.
- When animals are shot by hunters, sometimes buck-shot is left in the animal and discovered while eating the meat. The "shot-glass" was placed on the supper table for the diners to place any lead shot they found while eating.
- When toasting it is a custom for some individuals and organizations to slam the glass on the table after consuming the alcoholic liquid. Originally these glasses were called cannon glass or firing glass (because of the sound) but were eventually called "shot glasses".
- Perhaps the closest to the heart for the glassmaker is that "Shot Glass" was originally called "Schott Glass" after Friedrich Otto Schott. Friedrich Otto Schott founded the glassworks factory Jenaer Glaswerk Schott and Genossen in Jena, Germany in 1884.

SILESIA (SEE SILICA)

SILICA (SILESIA): (Item) Silicon dioxide is the main ingredient in glass art.

SILICOSIS: (Term) Silicosis is a chronic lung disease caused by inhaling too much glass dust.

SILVERIA: (Term) Silveria is glass art in which silver foil has been used.

SILVER SUIT: (Equipment) A suit of clothes (looks like a space suit) which protects the glass worker from the hot annealer or furnace. They are most often used to take the completed hot glass art object from the end of the blow pipe or punty to the annealer.

SLUMPING: (Process) The glass art technique of using a mold, heat, gravity and an annealer to form the art object. The mold is placed into the annealer with glass placed over the mold and allowed to melt from the high temperature (typical slumping temperature is 1250 °F) within the annealer and sink (slump) into the mold. Thus, the shape of the mold is captured in the final object. Sometimes a mold is not used and the glass is melted to make the desired object (e.g. bottles may be "flattened" by this technique).

SNAP CASE: (Tool) A device which holds the bottle in place while it is being finished. It was invented around 1855 and has a cup-like aspect to hold the base and arms to hold the neck. It allows the hot glass bottle to be completed without using on punty and thus, no punty mark.

SNORKLING: (Technique) A process in which a hollow tube made out of glass on the end of a blow pipe which is placed into the furnace and then glass is literally sucked up the tube. It is used for sculpturing.

SODA-LIME GLASS: (Term) The most common form of glass art is made of silica (60-75%), soda (12-18%) and lime (5-12%). The term soda-lime glass is used for this glass. The exact recipes for the glass mixtures, however, have been historically guarded secrets. Soda-lime glass is relatively light and workable over a wide range of temperatures. Therefore it lends itself well to the needs of glass art.

SODIUM FLARE: (Term) A bright yellow flare of light caused by the reaction of oxygen rich flame and sodium within the glass. The brightness of the flare makes it hard for the lampworker to see the object upon which they are working. Sodium flares are not considered to harmful, per se, but they are often accompanied by both ultraviolet and infrared light, both of which may harm the eyes. Flame workers will often use didymium glasses to filter ultraviolet, infrared and sodium flares.

SOFFIETTA (ALUMINUM PUFFER, LITTLE PUFFER, PUFFER): (Tool) A device that has a aluminum cone on a straight or curved blow tube. It is used by the gaffer to inflate a vessel after it has been removed from the blowpipe and placed on the punty. The gaffer can either blow into the soffiotta himself/herself, use a low psi air hose or an assistant. It "opens up" the bowl of the vessel. Soffietta means "little puffer" in Italian.

SOFT GLASS: (Term) A jargon term for glass with a relatively high COE (Coefficient of Expansion; e.g. COE of 104).

SOLIFLORE: (Term) A vase with a bulbous body and a long neck for a single flower. French term.

SPATTER GLASS: (Term) Glass art piece with flecks or shards of glass melted into the body of the glass art piece. Often the shards are of a contrasting color and give a "spatter" effect.

SPIKE (SEE PUNTY)

SPIRE VASE: (Term) Spire Vase is a HGA term for a vase with tapering conical or pyramidal shape. It looks similar to the nuclear power plants chimneys.

SPRAY FORM: (Term) Flowers are divided into three major forms by florists (**SEE FLOWER FORM**). Spray form flowers and berries splay from a center stem. They offer softness and contrast to the other flower forms. Spray forms offer support to the more dominant round form of flowers. Examples of spray form includes: Carnation, Chrysanthemum, Hypericum Berry, Lily, Lisianthus, Oncidium Orchid, Peruvian Lily and Stephanotis.

SPUTTERING: (Process) The act of coating a glass surface with metal (e.g. aluminum) is called "sputtering".

SQUEEZING (FINING): (Process) The act of getting the small glass bubbles (seeds) out of a piece of glass by cooling the glass and then reheating the piece. The process forces the small bubbles out of the top of the glass. The entire process takes place inside the furnace.

STANNOUS CHLORIDE: (Item) Stannous chloride (SnCl_2 or Tin II) is a white crystalline powder which is a reducing agent that undergoes hydrolysis when heated. This leaves an iridescent color or hue on the glass.

STAINED GLASS: (Term) The name for the art of putting colored glass pieces of glass into comes (slender grooved lead bars used to hold together the panes in stained glass or latticework windows) to form the desired pattern.

STRAIN CRACKS: (Term) Strain cracks are fissures in the glass caused by internal stress from poorly matched COE glass, inadequate annealing and/or thermal shock. They can be best seen through a polarized lens.

STEAM PAD: (Term) Water saturated newspaper placed on the floor to allow the rim of a pontied piece to touch the paper, creating steam which in turn inflates the piece.

STEAMSTICK: (Tool) A cone shaped piece of wood that is used instead of a soffiotta. The wood is soaked in water and creates steam when placed next to the hot glass object. The steam inflates the piece without having the gaffer need to blow. The steam stick needs to be rotated in order to keep the seal.

STRAIGHT SHEARS: (Tool) A set of shears used to cut along a straight line, trim a rim, or to cut into the lip (making flap-like aspects). It is also used to cut bits.

STRIKING: (Process) The act of heating glass to develop the color of the glass which appears only within a limited range of temperatures. Often the glass is reheated to strike the color.

STRINGER: (Item) A "stringer" thin string-like piece of glass which is "drizzled" from a molten blob of glass over the surface of the hot glass art object. An alternative method is to make long strings by pulling the glass (similar to make very thin cane). The pulled stringers may be cooled and used in subsequent art pieces.

STUDIO GLASS: (Term) A term used to describe glass art objects created in a small studio instead of a factory.

STUDIO GLASS MOVEMENT: (Term) The glass art phenomenon which started in the 1960s and was characterized by glass artists working independently in their own

studios instead of factories is terms the "Studio Glass Movement". The emergence of small furnaces and easy to use glass made the movement feasible.

SURFACE CRACK (SEE CHILL-MARK)

SWEDISH BOWL: (Term) Swedish bowls are a thick shallow dish made by HGA. They are ideal for potpourri, floating flowers, candy dishes, votive candles and decoration.

SWEDISH OVERLAY: (Term) The action of leaving a thin color on the outside of a piece but turning it inside out. The bottom of a bubble with a color on the inside is attached to a core of new glass (either clear or colored) and then the bubble is turned inside out. This leaves the inside color on the outside of the core.

T

TACK FUSE: (Term) Slightly melting a series of cane or murrini pieces together to they may be picked up as a single unit onto the hot glass art piece being made. It is a temporary fuse.

TAG (SEE TAGLIA)

TAG-A-DOOR: (Term) Jargon for hitting the door of the glory hole while moving piece in and out.

TAGLIA (TAG, TAGLIOL): (Tool) Taglia is a thin metal blade paddle used to flatten the bottom of a glass art piece. It is also used to groove hot glass. It is sometimes called the sculptor's best friend.

TAGLIOL (SEE TAGLIA)

TALENT: (Term) Unlike many other forms of art, glassblowing begins and ends with the completion of the object all at a single setting. There are exceptions to this but for the most part the piece is completed while hot and then refined (polished) after cooling. Live art (e.g. dance, music) and ceramics are similar to this in that there is no stopping until it is finished. Whereas painting, sculpting, writing, etc can be started, stopped and restarted when needed. Like live art, ceramics and sculpting there is no "do-overs" in glassblowing. Thus, the artists that are drawn to this media have a sense of urgency, driven to completeness, talent and vision and the personality traits to match this art. As Steven King said in his books: "talent won't be quiet --- it cries out to be used". ***Talent is the engine for the glassblower's sense of urgency.*** Because of the nature of glassblowing art, experienced glass art artists are less likely to be judgmental of others but do expect people (especially the assistant) to do it right the first time. (Also **SEE GLASSBLOWING, GLASSBLOWERS' TRAITS**)

TANK (SEE FURNACE)

TANKS: (Item) There are various gas tanks throughout a hot glass studio. These vary in size and shape. The variation is part of the safety features so that the various gases will not be easily confused. The tanks are built to hold pressurized gas at room temperature and may have thin walls to hold low pressure gas (e.g. propane, 250 psi) or have thick walls to hold high pressure gas (e.g. oxygen, 2000 psi).

TARGET BALLS: (Item) Glass shooting target-balls have a fascinating history. Before "clay pigeons" glass balls were used as targets in exhibitions, completion and even Wild West Shows. The balls were approximately the size of today's glass Christmas tree ornaments, were used and produced in the USA, Canada and Europe and reportedly were introduced by Charles Portlock (Boston) in a shooting competition in 1867. However, their popularity wasn't realized until 1877 when A. H. Bogardus invented a better glass ball trap (the device which throws the balls) and patented several glass ball designs. His diamond-shaped design gave texture to the balls allowing them to curve or "wobble" as they were thrown (similar to a baseball) as well as giving the buckshot a better chance of catching the ball rather than ricocheting off the edge of the ball. Obviously all these balls were hand blown. The necks of the balls were rough as they were broken off from the blowpipe (similar to a punty mark, **SEE PUNTY MARK**) and polishing the balls was, obviously, not done. These "neck marks" could be used in some cases to identify a specific manufacturer. Manufacturers included Hagerty Bros (New York City, sole distributors of the Bogardus' glass balls), the Bohemian Glass Works (New York City, who made feather filled glass target balls) and Whitall (Millville, NJ). Colors included amber, blue, green and purple. Some balls were coated with sand while they were still hot glass, others filled with feathers (symbolizing a bird) or silk streamers (Annie Oakley is said to use these in her show). A famous shooting competition was held in Louisville, KY in 1883 between the two greatest target shooters of their day (Adam Bogardus and W. F. "Doc" Carver). Doc Carver won the first competition by a margin of only one target and also beat Bogardus in subsequent competitions in St. Louis and Chicago. Then George Ligowsky held a competition between Bogardus and Carver to promote his newly invented "clay pigeons". The series of competitions achieved Ligowsky's goal of proving that "clay pigeons" could be used for shooting competitions without leaving glass residue all over the ground after the shoot. The "clay pigeon" eventually replaced the glass target balls but for a while they continued to be used in Wild West Shows until the 1920s by Annie Oakley (who had silk streamers inside her balls) and Buffalo Bill who chased and shot the balls while on horseback.

TAZZA: (Item) Tazza is a low bowl commonly used to hold desserts, fruit, Champaign, candies, floating flowers, etc. Achieving smooth, even and contoured sides properly aligned makes the low bowls one of the most difficult shapes to make. HGA makes a series of low bowls.

TEA LIGHTS (VOTIVE LIGHTS): (Item) Tea lights are a vessel for holding small votive candles. They are small flask shaped objects with or without a formal foot and a flared lip. HGA has a series of tea lights.

TEARDROP VASE: (Item) A teardrop vase is shaped like a water droplet with a narrow neck and a flared top.

THERMAL SHOCK: (Term) A rapid and uneven exposure of glass to temperature change may result in fissuring, cracking, shattering or even breakage of the glass object. Although thermal shock may occur from heating or cooling suddenly, it most often occurs when the hot glass object is exposed to a colder object. Even sweat or cold water can cause thermal shock. For this reason, all metal tools are preheated before use on the hot glass art object.

THERMOCOUPLE: (Item) A thermocouple is a device used to detect a change of temperature by creating a voltage only wire length when the temperature varies along the wire. Thermocouples come in Type K, Type N, Type R and Type S. Types K and N are most commonly used in the hot glass studio because of the thickness of the wire (16 gauge or more) and the temperature range (up to 2300 °F).

THREAD: (Term) Thread is a thin wrap or spiral of glass that goes around a vessel.

THREADING: (Action) Threading is the process of winding the glass thread around an object. Often the threading is done in such a way as to give the appearance of parallel lines.

THREADING ROLLERS: (Equipment) Threading rollers consist of 2 small wheel-like rollers/bearing mounted on each of 2 arms/brackets. The blowpipe or punty is nestled in between the two rollers on each arm and then may be spun in place to allow the hot thread of glass to be applied. If the arms are placed at an angle to each other then the glass thread will produce a spiral on the hot glass art object. (Also **SEE THREADING WHEEL/MACHINE**).

THREADING WHEEL/MACHINE: (Equipment) The threading wheel is a more elaborate form of the threading roller (**SEE THREADING ROLLERS**). Similar to the Threading Roller, the Threading Wheel is basically a pipe rest which allows the gaffer to apply a the hot glass threads evenly in either parallel or spiral fashion. The blowpipe/punty may be rotated faster or slower in order to space the threads and angled (by adjusting a bolt) to achieve spiral versus parallel designs.

TIEFSCHNITT (SEE INTAGLIO)

TONGS: (Tool) Tongs are large tweezers-like (usually metal) tools used for picking up glass, transferring hot glass and pinching off pieces of glass from the glass art object. They are also commonly used to apply water to the blowpipe or punty in order to "break off" the glass object.

TORCH: (Tool) A torch is an apparatus that burns with a hot flame for welding, brazing, or soldering. There are several types of torches used in the making of glass art. Propane torches are finishing torches whereas acetylene and oxy-gas torches are hotter and used melting glass together. High BTU flame thrower torches are used to keep all of a large piece hot during long working sessions. Lampworkers use desk-mounted propane-oxygen torches. Torches are also used in goblet making, hot casting and sculpting.

TORPEDO URN: (Item) A torpedo urn is a tall urn with wide shoulder and tapered point at the bottom. They are for decoration more than functional vases. HGA makes these upon custom request.

TRAIL: (Term) A trail is a thread of glass "dripped" or "drawn out" from a gather to decorate the glass art object.

TRANSFER: (Action) The act of moving the hot glass art object from the blowpipe to the punty is called "Transfer". The steps to the transfer include:

- A small gather from the furnace is used to make the desired punty
- The gaffer uses a tool to guide the punty to the center of the hot glass object
- A drop or two of water is placed on the "jack-line" (**SEE JACK LINE**) of the hot glass piece --- this creates a micro-fissure in the object (**SEE WETTING OFF**)
- The blowpipe is placed on the bench arm and tapped by a solid metal tool which causes the hot glass object to "break off" of the blowpipe at the jack-line and to be left entirely on the punty for further work

This process allows the other end of the hot glass object to be worked (e.g. opened up). The transfer is clearly part of the "Hot Glass Ballet" (**SEE HOT GLASS BALLETT**).

TREASURE SERIES: (Term) A HGA series suggest the mystery of sunken or buried treasure, a starry night, or the majestic seascape of the Kauai Na Pali Coast. Each design is a different process. Each time you look at them you will discover new beauty you didn't notice before! These pieces are truly luxurious Treasures to compliment your home. Although good for any flowers the rich designs makes these pieces especially ideal for winter flowers. Please click on the Vase Determinator on the HGA website to learn more about vase selection.



TROUBLE MAKER: (Term) A piece that is not sized properly, colored correctly or shaped slightly different for an existing art series. There is nothing wrong with the piece it just does not fit in with the series.

TROUGH: (Tool) A trough is often used to load batch or cullet into a furnace. It is typically 2-3 feet long and 4-8 inches wide. The cullet or batch is loaded into the trough and then dumped into the furnace. Batch is dangerous if inhaled (**SEE SILICOSIS**) and the

trough may be get hot, thus the person loading the batch often wears a respirator and gloves.

TWEEZERS (PINCERS): (Tool) Tweezers are similar to tongs in their use: pull, squeeze, shape, pinch off bits of glass, picking up glass and transferring hot glass bits. The tips are often bent to allow better grip and to hold more water when chilling the jack line.

TWISTIE (SEE ZANFIRICO CANE)

TWO-PART MOLD: (Tool) A mold (usually metal but not always) which comes in two-parts. After the casting or blowing the molds may be separated from each other. These molds are used more than once.

U

V

VACUUM PLATE VACUUM ENCASEMENT, STUMP SUCKER: (Equipment) A device used to draw or pull down clear glass over objects of which the glass artist wishes to encase. It is used mostly by paperweight makers and is good to eliminate or minimize bubbles while covering the objects inside the glass ball.

VASE DETERMINATOR: (Item) The Vase Determinator is a unique-to-HGA tool to help guide a person in vase selection. The Vase Determinator provides the user with ideas on the best vase for the season, the flowers of choice, the state flower, the birth flower, the anniversary flower and the correct vase-to-flower ratio based on the golden ratio. Please click on the Vase Determinator on the HGA website.

VASEOLOGY: (Term) Vaseology is the study of the proper use and choice of a vase for the flower, the occasion, the season, etc. The Vase Determinator is a practical application of "Vaseology".

V-BLOCK: (Tool) A V-Block is a home-made tool consisting of two pieces of wood joined in a "V" configuration. The wood is usually lined with wet newspaper and the hot glass object is placed between the two pieces of wood. The V-Block is like two paddles joined in a "V". It allows for easier method to make cylinder-like objects. It is usually a 90 degree angle.

VENETIAN FROSTED GLASS (SEE OVERSHOT GLASS)

VENETIAN VIRUS: (Term) Jargon for having a passion for Venetian style glass art and glassblowing. It is a form of being "bit by the glass bug".

VERI-FLAME: (Equipment) Part of the safety system of the combustion train includes the Veri-Flame system. It consists of a microprocessor, a flame sensor and analog circuitry to monitor the flame of gas burners. The Eclipse Veri-Flame CE system is standardly used in most hot glass studios.

VETRO A RETICELLO (SEE RETICELLO)

VINTAGE GLASS: (Term) Vintage must be referenced to a year, for instance: "a glass vase, vintage 1925". It does not refer to the age (like the term "antique") of the object. (SEE ANTIQUE GLASS).

VINTAGE SERIES: (Term) A HGA term for a series of glass comprise a combination of classic and contemporary styles. It is offered in three classic shapes. In the website, look closely (zoom in) for the bubble trapped in each diamond-like figure. A piece from this creative design will promote a peaceful and relaxing mood in your home. Although good for any flowers the warm colors makes these pieces especially perfect for fall flowers. Please click on the Vase Determinator on the HGA website to learn more about vase selection.



VIRTUAL PRODUCTION REPLICATIONS: (Term) The remaking of a glass "production piece" for historical restoration and preservation. A historical reproduction.

VETRO A RETORTI: (Term) Vetro A Retorti is an Italian term for a type of glass art object that is made with cane twisted to form a spiral pattern.

W

WARLOCK BALLS (SEE WITCHES BALLS)

WASTE MOLD CASTING: (Technique) A mold that cannot be removed from the glass casting without being destroyed is called a Waste Mold. Often these molds are made of clay or plaster.

WATER: (Tool) It may seem strange to call “water” a tool. However, water is used extensively in all hot glass studios. It is used to keep the newspaper wet; it is used in cold working; it is used to “break off” the hot glass object from the blowpipe or punty; it is used cause crackle glass (**SEE CRACKLE GLASS**); it is used to clear the pipes from hot glass when finished with their use; and, it is used to refresh the hot glass artist and his/her team when working in the hot shop.

WAX (BEES WAX, CARNAUBA WAX, MUD): (Item) Wax is used to lubricate jacks, and other metal tools. The two types of wax typically used are bees wax or carnauba wax (a harder wax than bees wax). The wax is usually kept on the wax post (**SEE WAX POST**). Some gaffers prefer to mix their own wax and have secret recipes.

WAX POST: (Item) The “wax post” is a small extension tray on the bench used for holding the wax.

WEDDING RETICELLO BOWL: (Item) Reticello bowls are used to commemorate weddings by some individuals. The bowls are of particular beauty and intricate representing many aspects of the marriage to come. The two lines represent the lives of the bride and groom twinning about in life and the bubbles represent the memories they create together. The bowls may be a low bowl (**see below** for an example) or a deeper bowl. A poem has been written for and by HGA about the bowl. It is copyrighted.

THE WEDDING RETICELLO BOWL[®]

Lines of color, once separate, now one
Like you, entwined in a new life ribbon
Crisp and distinct yet clearly in rhyme
Forge the bubbles of mem’ries caught in time
The ring of the bowl chimes in harmony
One sound but two lives in one solidarity
New partners, the bonding of many parts
Are better as one, as they’re linked by their hearts



WEDDING SERIES: (Term) The HGA Wedding series of flowers, hearts, champagne flutes, shot glasses and reticello wedding bowls was designed for weddings as well as special moments in life that you want to share with that special person. The flowers and hearts make ideal wedding gifts for the bride's maids and the shot glasses make nice gifts for the groom's men. Toast your special day with the champagne flutes matching your wedding colors. A perfect wedding memento for the bride and groom is the reticello wedding bowl. Please see the Glassipedia for the poem and explanation of the reticello design. These pieces will leave a lasting impression and will always hold a special place in their hearts!



WET NEWSPAPER (SEE RAG)

WET SAW: (Tool) A wet saw is a diamond blade that is water cooled for cutting through glass.

WETTING OFF: (Action) The process of placing water on the jack line (**SEE JACK LINE**) for the purpose of creating micro-fissures in order to transfer (**SEE TRANSFER**) the hot glass art object from the blowpipe to a punty.

WHEEL ENGRAVING: (Action) The process of using a rotating wheel with abrasive materials to carve the surface of the glass art object.

WITCHES BALLS (WARLOCK BALLS): (Item) Witches balls are similar to Christmas glass ornaments with the exception that they are translucent and have internal glass strings spanning the inside of the orbs.

WOOD: (Item) Wood is used commonly in hot glass studios. Hard woods from fruit trees (cherry, apple, pear) are most commonly used. These woods are chosen because of the tight grain and smooth carbon surface upon burning. All wood which is to touch hot glass is soaked in water until it is "water-logged". The glass artist can tell if it is "water-logged" by the fact that it sinks instead of floats in the water. Once a wooden tool has been "water-logged" it is important to keep it wet or the wooden tool will crack when it dry out. Examples of wooden tools would include blocks, paddles, dowels, sticks and rods.

WOOD BLOCK (SEE BLOCK)

WOOD PADDLE (SEE PADDLE)

WOOD STICKS (SEE STEAMSTICKS)

WONKIE: (Term) Off-center piece or a badly marred piece. This becomes “crap glass” or trash at HGA.

WRAP: (Term) A term for a heavy bead or thread of glass that goes around a glass art piece for decoration. It can either be melted into the body of the art piece, left as a raised feature on the surface, dot wrapping or for feathering.

X

Y

YOKE: (Equipment) A yoke is a device used to support the blowpipe/punty while the piece is in the glory hole. The weight of the glass art object may be considerable and it is even more difficult to handle as all the weight is on one end of a 5 foot pipe. The gaffer cannot get his/her hands too close to the hot glass and thus is relegated to holding the far end of the pipe away for the hot glass. Support in the form of a bench is needed when shaping the glass art object and the yoke offers support for the heavy, somewhat unwieldy, pipe and hot glass. Yokes may be standing or rolling. A standing yoke has a series of ball bearings in which to rest the pipe. This allows the pipe to be rotated and moved in or out of the glory hole. However, standing yokes are stationary. Rolling yokes offer the same ball bearing capabilities but the yoke itself is on a track. Hence the entire yoke can be moved forward or back if needed. For very heavy pieces a rolling yoke is commonly preferred.

Z

ZANFIRICO: (Item) A type of cane. Italian decorative glassblowing technique involving intricate patterns of colored glass canes arranged and twisted to comprise a pattern within a new single glass cane. These new patterned canes are then used to create a glass work.