

GlassTech

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Fabrication, Handling, and Installation Instructions

1. Introduction

GlassTech is a high-grade, inorganic material produced by high temperature forging; it is an environmentally friendly material for countertops, bar tops, vanities, cladding and paneling. It can be used for both indoor and outdoor applications. **GlassTech** is resistant to weathering and it is made from inorganic materials. **GlassTech** is produced of 99% fused recycled glass and is resin free. This material is easy to clean and 100% non-porous. **GlassTech** is available three (3) slab thicknesses: 16mm, 20mm, and 30mm. **GlassTech** can also be supplied with a laminated glass (16-30mm thickness with 1mm layer and 5mm tempered glass), which is used typically in flooring installations and cladding applications. Also can with a PC backing (transparent) that can increase its own strength when fabrication.

2. Saw cutting

Every cut must be done using plenty of water. The proper blade speed, actual blades, and extremely flat table beds are prerequisites for clean cuts, with no chips. **GlassTech**, the company, is providing special saw blades to our exclusive distributors. Any saw blade used should be tested to find the optimum cutting speed for each bridge saw or CNC. A medium bond diamond blade gives the best cutting results and the type saw blade of choice for cutting **GlassTech** is a porcelain or ceramic type blade with a maximum thickness of 2.5mm. When making any saw cut, the blade must pass through the **GlassTech** by a minimum 2mm. In the "Tools Section" of this document you can see the preferred type saw blades and other tooling. Extremely hard blades, such as those used for granite, are not recommended for cutting the **GlassTech** product as this will cause large chipping and may even cause the slab to fracture. Dull or inappropriate type blades are likely to cause damage to the slab. Always prepare (sharpen) any saw blade before cutting **GlassTech**; this is accomplished by cutting through a piece of fireproof tile or grinding stone which cleans the diamonds. This sharpening process can be and should be repeated if chipping is noticed during the cut. **GlassTech** should only be cut on a saw table that is made of wood.

When using a stone/concrete saw or table, it must be very clean with no stone fragments. If the stone table is not perfectly flat, then it must first be leveled and then a 1-inch plywood sheet placed on top of the saw table, which will provide a level and clean surface. A piece of scrap quartz or marble must be placed adjacent to the **GlassTech** slab at the end of the saw rip. The cut from the **GlassTech** slab should continue into the scrap quartz/marble. This allows the blade's energy to be transferred to the quartz or marble and will help protect the corner of the **GlassTech** slab. High saw blade rotational speed (4,000 – 4,500 rpm's), slow cutting speed (1 LF per minute travel), and high water volume should always be used.

The best cutting result is reached by using a water jet, but water jet table is usually welding stainless steel with net structure. If put GlassTech on it to fabricate directly, then the stress is not equality and GlassTech may break when vibrated by water power or bearing uneven. So a 1-inch plywood sheet or soft rubber mat is requested to put on the table before cutting as they will equality the stress.

Following are manufacturer's guidelines for cutting glass.

3. Hand Cutting

Hand cutting blades should be the continuous rim ceramic or porcelain type. Hand cutting should be done utilizing plenty of water; never cut completely dry. If water is not available, as on some installation sites, then the **GlassTech** material must be taken to a location where water is available. The installer can use a wet rag of any type that is fully capable of transferring water easily by keeping it pressed against the saw blade. Cutting the **GlassTech** material dry will most likely result in large chipping and breakage. Hand cutting should always be done with water when fabricated in the shop. Water fed tools that cool the blade from both sides work best when making any type of cutout (sinks, bowls, cook tops, faucet holes, electrical receptacles, etc). It is necessary to wear safety glasses and a mask to prevent possible injuries, especially to the eyes. Water fed cutting also helps prevent injuries from occurring due to excessive chipping. When performing any cutting of **GlassTech**, never put too much pressure on the blade. The fabricator should allow the blade to perform the work and this will produce a very nice cut. Electrical receptacle cut outs should be handled with ultimate care, especially if 2cm material is used. If the cut outs are performed at the job site, the blade must be fully water-cooled or breakages are likely to occur.

Using plenty of water is the KEY to success in any cutting situation and this is not optional, whether at the shop or the job site.

4. Grinding

For performing the grinding by hand, use aluminum backing cup wheels with medium bond diamonds. Aluminum backed wheels limit vibration and since it is softer than steel backed wheels they allow minor flexing so there's more control. This type of the wheel gives a very smooth grind and will minimize chipping. You cannot use aggressive diamond tools on **GlassTech** without great risk of material damage.

When making a sink cutout with a CNC or handheld profiling machine, DO NOT start grinding with Position 1 (coarse). Start grinding with Position 2 and insure that your diamond wheel has holes for the water feed. Before you start grinding, be sure that you put a small bevel on the top and bottom to prevent chipping. Do not use the tool like you would on granite. Grinding has to be slow (let the diamond do the job) and make sure that the water feed is continuous and consistent.

To make a straight polish for glass, grinding is not needed if the proper saw blade is used for the initial cut. The polishing should begin from Grit 100 pads and up. The grinding cup wheels will be used only for fabricating non-straight edges (bevel, round, etc.). The cup wheel of choice has either a smooth surface or is filled between the segments with epoxy resin or some other appropriate material. L-Shaped countertops require a full 150% radius on all inside corners (1.5 times material thickness = radius dimension). All 90 degree inside corners must be avoided. Inside edges of the L-shape must make a slight polish in order to make it smooth and avoid any small crack that can not see obviously on the edges because small crack will enlarge big crack.

Grinding stones are not allowed in the fabrication of **GlassTech**.

5. Filling holes

Similar to other glass materials, **GlassTech** has some holes on the edges and on the surface. Filling up these holes must be done before polishing. After the saw cut, you have to thoroughly dry the surface and use a high-pressure air nozzle to get out all debris from the holes. After drying, wipe the edge with acetone as this also cleans the smallest of holes. If you use a torch to assist in the drying process, you must monitor the temperature of the glass and not let it get above 90 degrees Celsius (195 degrees Fahrenheit). **GlassTech** is heat resistant but all glass absorbs heat at least two times faster than stone! Excessive heat will damage all glass, including **GlassTech**.

Three (3) ways to fill holes:

- a. Fill up the entire edge to be polished with polyester resin (similar to how you fill up travertine) and then after it is dry, start polishing with Grit 100 polishing pad. In this case, because it is very coarse, this pad will grind away all of the extra glue (resin) so you must be very sure that the water feed is has plenty of pressure, otherwise this pad will “pull out” the glue from the small holes.
- b. Fill up only visible holes and then start polishing with Grit 200 polishing pad. This pad will take off any extra polyester resin and will polish all of the desired edge to be finished.
- c. After making the saw cut, start polishing with Grit 100 polishing pad and continue to Grit 200 polishing pad. After this is done, then completely “dry out” all edges to be finished and clean the holes. Fill up all holes with polyester resin and let it dry. Do not put too much resin – just enough to cover each hole. Next, continue polishing with Grit 400 polishing pad. Spend a little more time until all of the excess polyester has been removed. Again, continue polishing with Grit 800 polishing pad through Grit 3000 polishing pad. This method gives the best results; the whole process is a little slower than #1 and #2.

In the case that not all holes were filled using one of the above 3 methods, you can also fill up holes after the polishing is done. Just be sure/ that the surface dry before filling up any holes that were missed or that polishing removed the resin. Just before the resin cures (gets hard), cut off any excess with a razor blade and smooth it all with a very fine steel wool (#0000) or use the last two polishing pads again. For all transparent colors (Ash White, Pine Green, Ocean Blue, and Coral Blue) use “water-clear” resin and for dark colors (Azurite and Chorus) create a matching resin color.

6. Polishing

GlassTech has very good polishing qualities; polishing is very simple and very similar to natural stone polishing. The difference is that **GlassTech** is a consistent material so there are no “soft & hard spots” within the material. Polishing can begin with Grit 100 polishing pads and continue all the way through to Grit 3000. Stepped polishing will achieve a smooth finish without waves or ripples. There is no need for buffing or waxing. Dry polishing MUST be avoided, even on the job site.

7. Drilling

Water must be used for cooling the bit while drilling; this is also true when cutting and polishing. Before buying a special drill bit, test the ones you already use for natural stone drilling. The best drilling results are achieved by using “water fed, medium coarse, continuous rim, bonded diamond” drill bits. Drill bits, like saw blades, must be prepared (sharpened) before use; prepare in the same manner as the saw blade, use a fireproof tile or grinding stone to clean the diamonds. **GlassTech** will drill very smoothly as long as the proper speed is used (2,000 – 2,500 rpm’s). Avoid twisting and applying extra pressure while drilling; drill slowly, allowing the drill bit to cut steadily. The backside of the **GlassTech** material must be “supported” with a wood product when drilling a faucet or other type hole. The support should not allow the **GlassTech** to either flex or move in the slightest. Drilling into the support also avoids “blow out” on the backside and prevents excessive tool penetration, which could result in “high speed tool contact” with the **GlassTech** surface, an excessive force likely to create damage to the **GlassTech** countertop.

8. Sink Cut Out

Drill holes into each corner of the sink template before cutting the appropriate sink hole. For example, if you have a square or rectangle sink hole, you should drill in all four corners with a drill bit that creates the required

radius and then start cutting. This will relieve the stress and will prevent the **GlassTech** from opening (cracks). Unlike other baked glass materials, **GlassTech** has a very limited percentage of stress, which allows you to cut holes into any size slab produced. Before making a cut, be sure that the fabrication table is flat with no gaps or spaces at any point-of-contact and that there is no movement of the counter top during the sink cutting process. There must be a minimum of 4" of **GlassTech** on either side of the kitchen sink hole or the bathroom vanity bowl hole.

The minimum radius of all inside corners should not less than 5mm.

This is true whether the corner is in a sink hole, a bowl hole, a stove top, or a countertop.

Inside edges must make a slight polish in order to make it smooth and avoid any small crack that can not see obviously on the edges because small crack will enlarge big crack.

9. Handling

Handling of **GlassTech** is one of the most important aspects and these are very significant details. Follow these proven methods:

- a. For all aluminum or steel framed fabrication tables, in the shop or outside, use rubber or wood to avoid any contact between **GlassTech** and the metal. Be 100% sure that the table frames are flat and that the **GlassTech** contacts all points equally before clamping.
- b. When moving slabs, take great care to avoid any contact with any object to maintain the **GlassTech** integrity. Please refer below platform which is best to moving slabs as this kind of platform can even the stress from outside.





Separate each piece of GlassTech slabs with softy materials as it will not easy crash and broken.

- c. Should cabinets be made of aluminum or steel, these too should have “high density rubber” or wood barrier.
- d. Prior to loading, clean the **GlassTech** slab’s finished surface thoroughly to ensure that there are no bits of glass, stone, dust, dirt or other debris on the surface. During the loading and transportation and unloading, extra caution should be used to prevent any type debris from getting in between the slabs.
- e. Since **GlassTech** has very little flexibility, unlike marble or granite, it is very important to protect against any kind of bending, tension, and stress during the clamping and/or strapping for transportation.
- f. **GlassTech** may never be carried nor transported “flat” on any type vehicle; moving **GlassTech** either vertical or near vertical is the only accepted method (7 degrees is optimum angle and 11 degrees is the maximum allowable angle).
- g. Anytime a hole is to be cut that leaves the minimum allowable stock (4”) of **GlassTech**, be it a sink hole, bowl hole or stove top, the cut is ideally to be done at the job site with the **GlassTech** placed in proper position and secured. Extra care must be taken to support the entire circumference of any hole that is cut into **GlassTech**.
- h. Sink supports are not optional even for lightweight under mount sinks such as stainless steel and copper. Heavy-duty sink supports are required for heavy type under mount and top mount sinks such as cast iron, porcelain, and composite stone types.
- i. **GlassTech** should be kept in a dry and ventilated place. Use soft spacers between each piece in order to allow moisture to escape as this eliminates mold and mildew in a high humidity environment. Same size of **GlassTech** should put together and A frame is required to put GlassTech as below pictures show, if need to mix various size to put together than need to put soft spacers between each piece in order to even the stress.



Backside and bottom of A frame must have soft material and wide board with soft material to support.

- j. **Never put *GlassTech* on floor , wall side or frame without any soft support material such contact with steel directly is not allow, any hard / solid material should avoid to contact with *GlassTech*.**
- k. If ***GlassTech*** is to be stored outside, the cover with either and awning or waterproof cloth; remove the waterproof cloth after the rain which will allow the excessive humidity to escape.

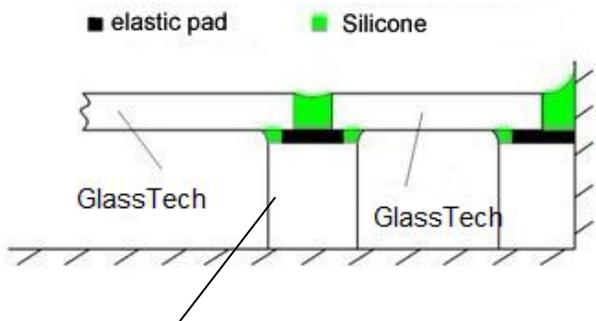
10. Installation

GlassTech seaming requires the same “basic” procedures as used in most solid surfaces, except leveling. ***GlassTech*** is currently produced in two types of coloring patterns: dark opaque and semi-translucent. For dark colors, clear silicone is used as the bonding agent (polyester resin especially Epoxy is not required) and installation is performed by leveling the ***GlassTech*** pieces from the bottom side with either wood or composite flexible shims; suction-type leveling devices may be used to “pull” the pieces together. For semi-translucent colors, use only “water clear” silicone. It is very important because other types of silicone will tend to magnify the seams when back lighting or under lighting is utilized. It is important to remember that ***GlassTech*** is not very flexible, much less than natural stones or man-made solid surfaces. Therefore, with regards to leveling, pressing one side or edge or corner to achieve a level on the opposite side or edge or corner is never allowed and must be avoided.

Leave gaps between the wall and the ***GlassTech*** material even each piece of ***GlassTech***. This will provide space for ***GlassTech*** to expand and contract. This is why only silicone is authorized for use not only as a “seam

filler” but as a contact substance for attaching to the cabinet. Silicone may be used to fill the gap next to the wall but this is usually not necessary since coverage will be provided by the backsplash. Thin set, mastic, epoxy or cement are never allow with the use of **GlassTech**. Flowing are some instruction in various uses:

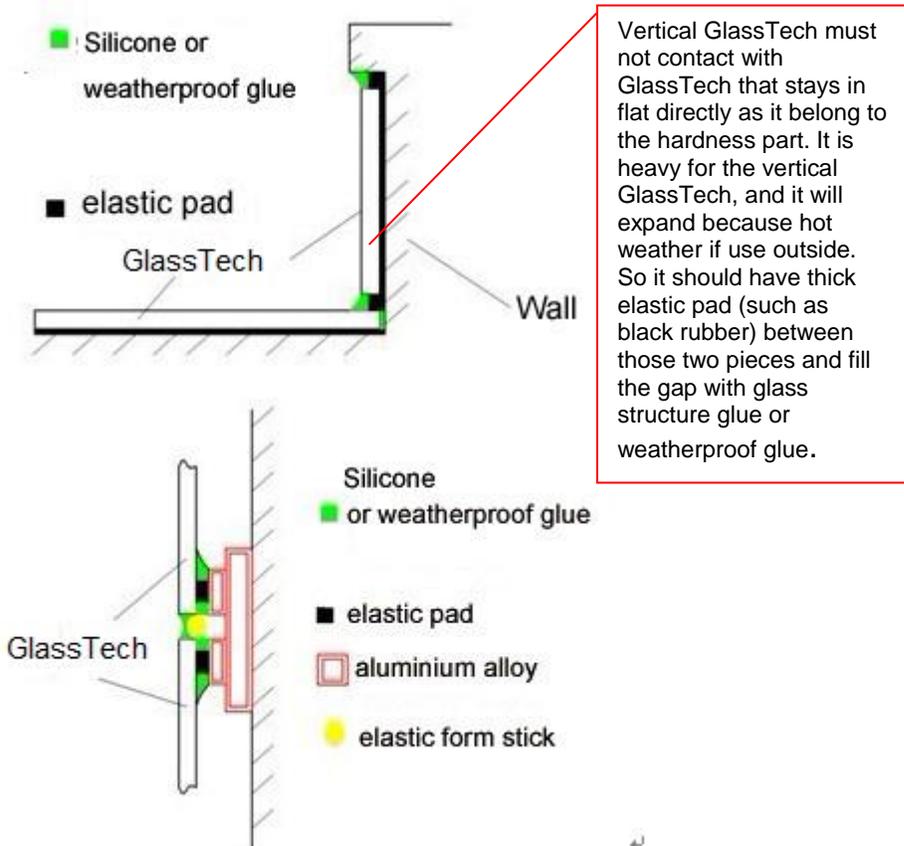
a. Table tops:

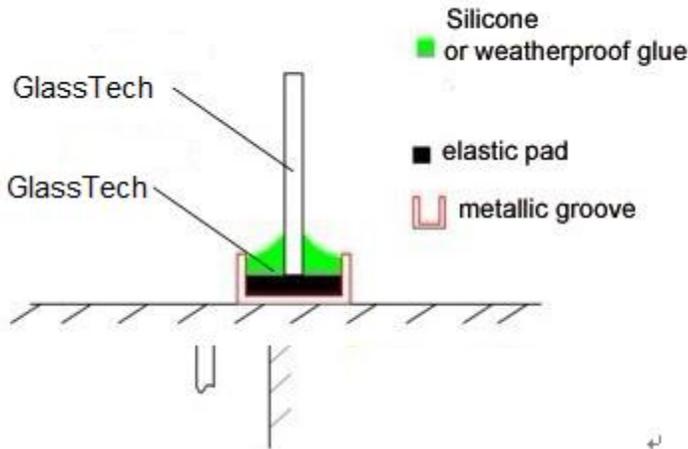


Supporting table or legs

b. Cladding

Cladding applications, whether interior or exterior, must utilize the **GlassTech** with integrated glass laminated backing that is specially produced by the **GlassTech** factory only. Special clips and anchors can be provided upon request.





c. Expand gap suggestion for both interior and exterior:

1) Interior

Temperature is not high in interior, so expand gap can leave around 3mm. But if some places have sunshine expose then better leave to above 5mm

2) Exterior

There have big difference of the temperature outside, meanwhile because of sunshine expose in daytime. So expand gap can leave according to below list

Size of the panel	Expand gap
1, under 300mm	3-5mm
2, 300-600mm	5-10mm
3, 600-1000mm	10-15mm
4, 1000-1500mm	15-20mm
5, above 1500mm	20mm

d. Flooring applications, when **GlassTech** is to be elevated for lighting or insulation purposes, requires laminated glass which 16-30mm GlassTech with 1mm layer and 5mm tempered glass that only be done at the **GlassTech** factory. And flooring suggestion will need to be take note:

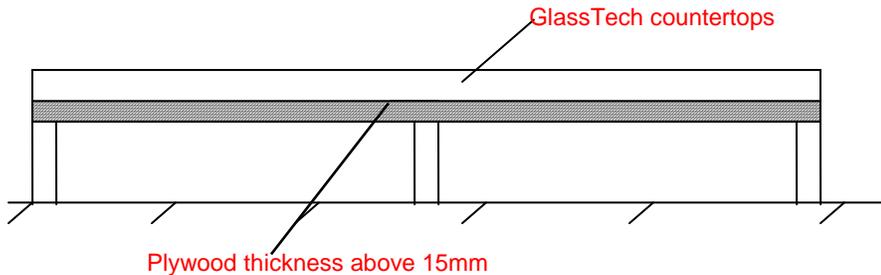
1. Before install on floor, stick one layer of protect material on GlassTech surface, that is in order to protect surfaces of Glass not be hurt when installation.
2. Floor must be flat and avoid use cement / epoxy to stick GlassTech on flooring, that means should use elastic material.
3. Avoid to contact cement directly as GlassTech should always contact with soft material.
4. Must leave the gap between each piece of the panel that is in order to make GlassTech have expanding space, and should use silicone to fill the gap. Make sure not use cement or other solid glue to fill the gap. Size of the gap can be 5-20mm which depends on the installation construction, environment and size of the panel.
5. Before fill the gap with silicone, need to make sure there are not sand / cement / concrete in the gap, if have then need to clear up first. Also better insert elastic pad in the gap that this in order to make GlassTech have expand space then fill with silicone.
6. Make sure background of the floor is same color that is in order to make sure no color difference after installation by vision.

e. Under mount sink installations must not utilize under mount sink clips that require drilling into the **GlassTech** material. Silicone is the only adhesive approved to attach an under mount sink rim to the **GlassTech** bottom side. If a garbage disposal is installed to the sink, the garbage disposal must be supported from the

bottom side. It is acceptable to put polyester resin on a wood or composite shim, then to place the resin at each corner and at mid-points of the longest sections of the under mount sink for added security.

f. During faucet fixture installation, extra care must be taken to not over tighten any of the parts that come in contact with **GlassTech**.

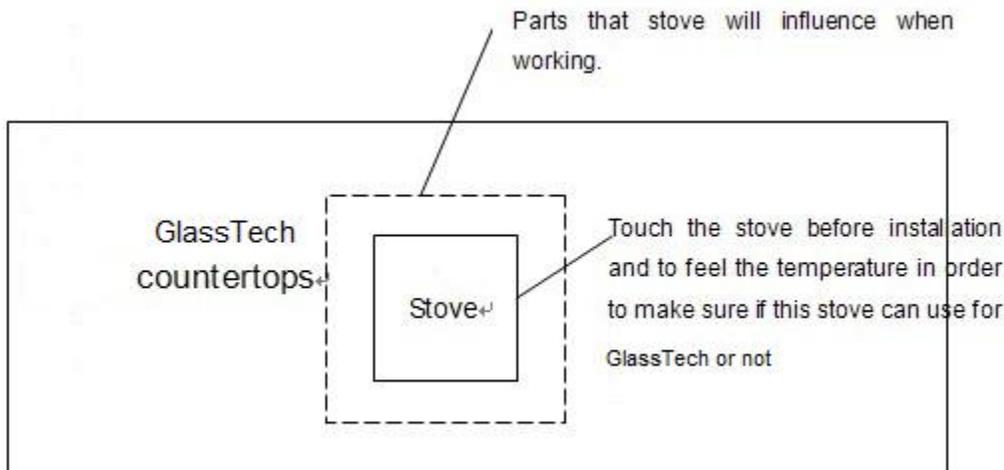
g. Countertops need to put plywood which thickness over 15mm under GlassTech, that is to balance and it can be flat.



h. Stove

Different ovens have different operation principle, installation way and heat transfer result also different too. So it needs to be test first before installation. Keep high temperature in a period and touch it to feel those parts which contact with GlassTech, if they are too hot then it means temperature is too high for those contact parts and it will cause some parts of GlassTech expand to crack. So that kind of oven cannot use in GlassTech countertops, or it need to change the installation way of oven.

For example, it can use thermal insulation material to avoid transferring high temperature. But if touch it and feel not so hot then it means temperature is not high and can install on GlassTech countertops.



Same principle if use in BBQ area or near fire pit.

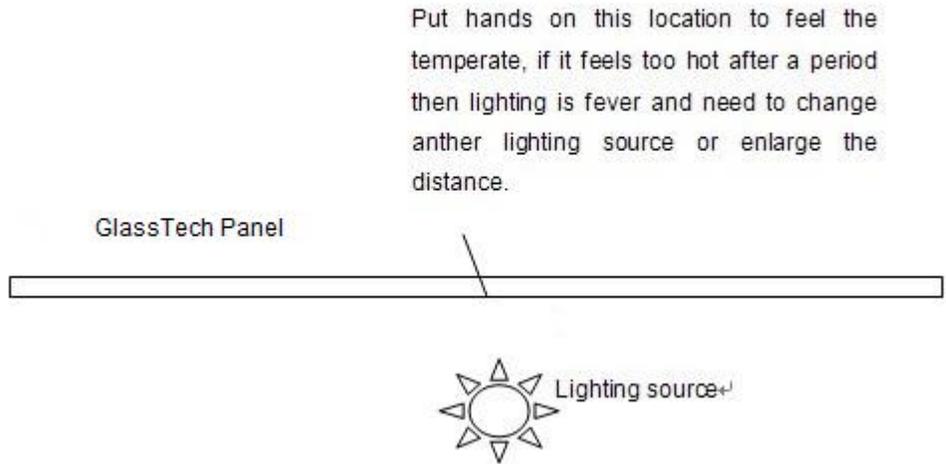
11. End User Guidelines

When **GlassTech** is being used as a countertop, it must not come into direct contact with any object that has a temperature in excess of 205 degrees Celsius (400 degrees Fahrenheit). Temperatures up to 90 degrees Celsius (195 degrees Fahrenheit) may not stay on the surface of **GlassTech** over ten minutes.

GlassTech has great transparent effect but do not use any large "heat producing" type lighting when establishing a light source to make **GlassTech** looks transparent.

- a. Example: Incandescent is 170 Celsius degree
- b. Example: Surface of LED is 30 Celsius degree
- c. Example: Fluorescent lamp, middle part of its is 40 Celsius degree, each side of the edge is 25 Celsius degree

So Fluorescent lamp and LED can attach to GlassTech. But Incandescent bulb can not do like that and must leave 150mm distance. And the best way to test and make decision is as below diagram



Once installed, **GlassTech** will be very strong and durable. Due to its non-porous nature, sealing or waxing is not required.

12. Repairs

GlassTech is a very durable produce yet scratches or chipping may occur during fabrication, transportation, or installation. Both scratches and chips can be repaired by the following method:

- a. Scratches - Acquire Cerium Oxide (a standard powder utilized in glass industry), mix with water to form a thin paste, apply to the scratch, and buff out using a high-density cotton buffing wheel at 2,000 rpm's or less.
- b. Chips - Chips on the surface or an edge can be filled with clear liquid polyester resin or clear knife grade polyester resin. If a color tinted resin is desired for the damaged edge or surface, applying the resin is done in the same manner as natural stone or a manmade solid surface (such as quartzite). Chips on a polished surface are more difficult to repair than edge chips. Water Clear polyester resin **MUST** be properly mixed and applied according to the manufacturer's instructions; once completely cured, razor off any excess and buff out using a high-density cotton buffing wheel.
- c. Note – if **GlassTech** takes an impact from a heavy item (such as cooking pot, large bowl, or skillet), the **GlassTech** material is likely to not shatter but, depending on the impact, a scratch or chip could occur.
- d. Warning ... any material (natural stone, man-made solid surface that imitates stone, or GlassTech) can be severely damaged or destroyed, including a shattering effect, if a large enough force is applied.

13. Tooling List of Commercially Available Items

- a. Bridge Saw Blade, 14" continuous rim, porcelain type
Diarex Terminator or equivalent
- b. Hand Saw Blade, 4" up to 8", continuous rim
Diarex Pro Series or equivalent
- c. Grinding (cup) Wheel with aluminum backing - 4", medium diamond grit
Diarex Legend or equivalent
- d. Drill Bit, diameter as per job requirements, continuous rim, medium diamond grit
Diarex Pro Series Thin Wall or equivalent
- e. Rotor Bit (Hand Held or CNC)
Consolidated #2 or equivalent
- f. Polishing Pads, high quality as if using on granite - 4", #50 - #3000
Pearl Abrasive or equivalent
- g. Silicone, water clear
C R Laurence
- h. Epoxy or polyester resin, flowing clear
Touchstone (epoxy) or Akemi Platinum (polyester)

Notes

- The use of any item not on the above list is done at customer's risk and full responsibility should damage occur or undesirable results obtained.
- **GlassTech** has developed its own proprietary brand of bridge saw blades, small hand cutting saw blades for both circular saws and grinders, cup wheels, drill bits, router bits, and polishing pads. These are used exclusively at the **GlassTech** factory for all cut-to-size projects. These items are proven to cut, grind, drill, and polish **GlassTech** not only without adverse affect but performs to the highest level of fabrication perfection. These items are available upon request and usually fast less expensive than those similar items available on the open U.S. market.