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## Translucent Faux Alabaster and Marble Fabrication Manual

The completion and/or installation of applications made from Faux Translucent Stone may involve secondary fabrication operations such as cutting, drilling, bonding or bending. This paper intends to inform the user about the properties and characteristics of Faux Translucent Stone and the tools to be used that must be considered if these operations are to be performed successfully.

The information below is based on years of experience, however cannot cover all possible operations nor applications. The user or installer is very strongly advised to perform suitable tests to be sure about the correctness of tools, methods, applications and safety.

### Important

- always allow for expansion / contraction with fluctuations in temperature (0.4. mm. mtr/10 degrees Celsius).
- do not use the Faux Translucent Stone in applications where the panel temperature will be over 80 degrees Celsius. Putting accidentally an item over 100 degrees Celsius (not hotter than 150 degrees Celsius) over a period of not more than 1 minute will not result in damage - if not repeated. Used as shower walls is fine, however use in a sauna not. Use as a kitchen top is possible, avoiding the point just mentioned. The material could then change in colour, warp, develop fissures or even break.
- UV exposure: Faux Translucent Stone is less suitable for applications in which the material is subjected to excessive or long term levels of UV-radiation. Discoloration or yellowing may occur.
- avoid larger horizontal surfaces without additional support. A span of 650 mm is max. when using 10 mm thick Faux Translucent Stone on 2 sides supported. When under (heavy) load, the span should be less. Test it! In backlit situation laminating on glass (different coefficient of expansion!) or on acrylic (almost same coefficient) can be realised easily. In vertical applications, a load perpendicular to the top edge of the sheet will result in bending and worst case even breaking of the sheet.

### 1 Storage

- Faux Translucent Stone should be stored at room temperature in a dry environment, not exposed to direct sunlight or heat.
- The panels should be stored horizontally on a 100% flat surface or pallet. Faux Translucent Stone will otherwise warp!
- Protective masking should be removed within 30 days of receipt to prevent adhesive from the foil sticking to the panel.
- Allow material to acclimatise fully (temperature / humidity) before fabricating. Parts to be joined must be in the same environment for at least 48 hours.

## 2 Machining

In general:

- Faux Translucent Stone can be fabricated using tools and machines as is recommended for machining solid surface materials.
- Diamond tools are recommended.
- Cooling of the tools by (cool) air or vapour/air is highly recommended.
- The speed of the tools should be such that the material does not melt from frictional heat.
- Best results are achieved at the highest speeds at which the material does not overheat.
- Leave the original masking on the sheet during machining.
- Practice on pieces of scrap.
- Use a consistent feed-rate.
- Hold sheets firmly while machining to minimize vibration. Use enough clamps.
- Feed always against the rotation of the blade or tool.
- Wear and use proper safe equipment.

It is essential to keep your cutting tools always sharp. Use at least hard, wear-resistant tools like carbide tipped ones

with greater clearances than those used for metals. Bring the machine to full speed before entering the material.

As Faux Translucent Stone is quite a good insulator, heat generated by machining is not carried away as easily as it is

with metals. In contrast to wood Faux Translucent Stone has no direction.

A good method of avoiding overheating is by making several passes while cutting or trimming the material.

Do NOT:

- Cut or drill with a dull blade, cutter or bit.
- Apply excessive clamping pressure.
- Scribe-break the material.
- Do not expect that this material will stay fixed safely to the cutting bed using only a vacuum.

### 2.1 Saw cutting

Circular saws, band saws, saber saws, jigsaws, hacksaws and handsaws can achieve reasonable results. However, some saws are better suited because they produce smoother, faster and precise cuts. For linear sawing the circular saw - also the ones that can be attached to a rail - are preferred. For shapes band saws usually produce the best surfaces.

Blade design is a very important part in successfully sawing the Faux Translucent Stone (FTS) A skip tooth band saw blade is preferred. It generates less heat and removes the chips more efficient. For best results the teeth should have zero rake and some set. For a curved cut the blade should be narrower and have more set than for a straight cut. The blade must be kept sharp and the blade guide should be placed very near the cut to minimize vibration.

A circular saw is preferred to a band saw for straight cuts even though it tends to generate more heat. A blade with diameter 300 mm should be operated at ca. 3000 RPM with a feed of at least 1 mtr/minute for 10 mm thick material. Use diamond or HM tipped blades. At least 40 teeth and the geometry of the teeth can be or side-set or roof-shaped. An almost zero rake is advised and the tooth should very free running. A perforated saw blade usually runs cooler. It is essential that the spindle bearing be tight so that the saw will run true.

## **2.2 Drilling**

Drills developed especially for plastics are widely available. We suggest that the fabricator uses such drills when drilling FTS. Standard twist drills for wood or metal can be used, however they require slower speeds and feed rates to produce a clean, non-gummed hole. Optimum bit speed, feed rate and applied pressure will depend on the size of the hole and the thickness of the FTS. Use drill speeds up to 1750 RPM for smaller holes and use speeds as low as 350 RPM for larger holes. Larger holes can be routed too of course. Lasering holes is no option. Watercutting however should be ok.

Twist drills as used for plastics are best. They should have two flutes, a point with an included angle of 60 to 90 degrees and a lip clearance of 12 to 18 degrees. Wide, highly polished flutes are desirable since they expel the chips with low friction and thus tend to avoid overheating and consequent gumming. Drills with substantial clearance on the cutting edge of the flutes make smoother holes than those with less clearance. Drills should be backed out often enough in order to free chips, especially when drilling deep holes. Peripheral speeds of twist drills for plastics ordinarily range from 30 to 60 meter a minute. The rate of feed generally varies from 0.1 to 0.5 mm each revolution.

Always when drilling: be sure to hold or clamp the part securely to prevent it from cracking or slipping and presenting a safety hazard to the operator.

## **2.3 Lasering / watercutting**

FTS should never be lasered. Do not try it!! Water cutting however seems an excellent strategy, especially for complicated work. We have ourselves no experience with it yet. As soon as we have executed appropriate experiments with a water cutting machine we will complement this paragraph with more information about this approach.

## **2.4 Routing**

Routing with sharp two-flute straight cutters produces very smooth edges. Routers are useful for trimming the edges of flat or formed parts (FTS can be heat formed), especially when the part is too large or irregular in shape for a band saw. Portable, overarm, CNC and under-the-table routers all work well. Feed should be slow to avoid excessive frictional heating and shattering. The router or sheet, whichever is moving, must be guided with a suitable template. It is recommended to employ compressed air during the routing operation to cool the bit and aid in chip removal. Tool speeds should be such that the FTS panel does not overheat. In general maximum tool speeds at which overheating of the tool or sheet does not occur gives best results. Another way of reducing heat forming is by making several passes.

It is important to keep cutting tools sharp at all times. Hard, wear-resistant tools with greater cutting clearances than those used for cutting metals are suggested. Diamond coated, HSS or carbide-tipped tools are most efficient for long runs. Bring the equipment to the full correct speed before starting the routing process.

On our router we use 16000 RPM, 3500 mm/minute, in 6 steps thru 10 mm material, last step 0.5 mm, cutter with 2 changeable HM-blades, diameter 15 mm. Direction of the tool with direction of movement. For V-grooves 90 degrees use always 100% fresh HM-blades and go 1.5 mm thru material. Sand before gluing. Direction of the tool against direction of movement.

## 2.5 (Re)finishing

Edge finishing is simply done with a router, in different forms and shapes. In addition to a straight edge, edges may accept bevelling and rounding. Additional finishing as sanding and polishing and is also easy to realise using standard woodworking tools (or better: tools used for plastics, especially solid surface materials).

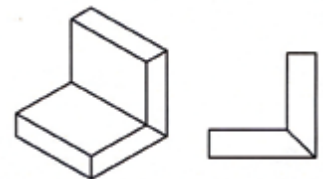
FTS can be finished using ordinary sand paper. However waterproof sand paper gives better and more efficient results. An double-excentric rotating sanding machine is preferred. For a high-gloss surface sand until grain 1000 sand paper and then polish the surface with a polishing machine (or a soft cloth on the sanding machine) and a polishpasta as used for plastics.

It is possible for FTS to become damaged by scratching. Light scratches can easily be repaired using sanding and polishing techniques. For very light scratches polishing with a paste as used for cars should be sufficient and lead to good results. Heavier scratches could need sanding and then repolishing.

## 3 Joinery

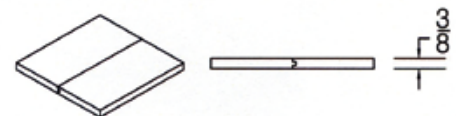
### 3.1 Adhesive seams

Miter seem: is an excellent and strong seam for most corner conditions



Tongue and groove seem: is for connecting flat panels.

Minimal visible effect when back lit.

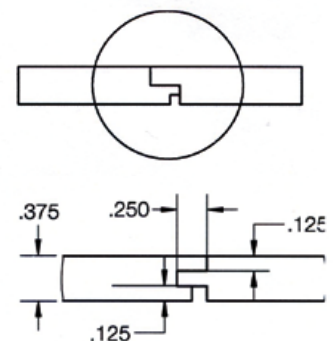


### 3.2 Loose seams

Loose seams are not glued and primary used when panels are backlit and/or when space should be created for panels to “work” in changing temperature conditions.

Half lap quirk: gives great accessibility for multiple panel installations.

Tongue and groove quirk: best aesthetic loose seam, however accessibility is limited on larger installations.



## 4 Fastening, adhesion and laminating techniques

### 4.1 Mechanical fastening

Faux Translucent Stone can be fastened attractively with mechanical fasteners. Recommended strongly is using through-holes. Self-threading is absolutely no option. Inserts are also not recommended at all. If needed: test it. Mechanical fastening is the correct approach for assembly of larger products.

**DO**

- Drill holes always oversized allowing for thermal expansion and contraction.
- Insure drilled holes have smooth edges.
- Use washers for better load distribution.
- Use light or moderate clamping pressure.

**DO NOT**

- Overtighten fasteners. Hand tightened is sufficient.
- Use self-tapping screws to hang large panels.
- Use cyanoacrylate or solvent type thread locking materials.

#### 4.2 Bonding with adhesives

The use of solvent glues or cyanoacrylates is not recommended for bonding or seaming FTS. Also the quite dry glues as used for solid surface materials seem to us not suitable as they are not translucent and also too dry. We have the best experiences with 2 component glues as used for PMMA, like the Acryfix 190 when gluing FTS to FTS. When some movement is needed - laminating stone to a wood surface - due to different coefficients of thermal expansion we recommend the transparent (when laminating on glass) or white acid-free silicon kit. A bond FTS to FTS will never be invisible due to the simple fact that the FTS is not even and solid coloured as is Corian or LG Hi-Macs.

Our in-house-gluing-specialist makes -when gluing FTS to FTS- a special mixture adding some opal-white pigments or light-scattering agents to the glue in order to reach the same translucency as the FTS has.

#### Surface preparation

Ensure that all substrates are clean, dry and free of oil, dusts or other surface contaminants. The amount of surface (or edge) preparation directly influences the final bond strength of an adhesive. Wipe with a clean cloth resin substrates with a 50/50 solution of isopropyl alcohol (IPA) and water. For metal substrates sandblast or abrade with 150 grit sandpaper followed by a water wipe with a dry clean cloth.

#### Directions for use

Download the instructions for using the Acrylic 190 from the site [www.acryfix.com](http://www.acryfix.com). Also the safety-datasheets can be found there. The glue can be supplied by us or by your local Evonik representative. For the silicon kit when making transparent or translucent bonds: we have good experience with Soudal Silglaze N. Website is [www.soudalgroup.com/global-gateway/](http://www.soudalgroup.com/global-gateway/). Or choose another neutral kit. Follow the instructions of the supplier. In general: the thickness of the kit-layer should be the same as the expected difference in expansion between the two materials. For not-visible bonds use a construction-kit that stays permanent flexible and can not be seen through the FTS.

When bonding the edges of FTS panels, first mask the face of the panels with masking tape closest to the edges to be bonded. With acrylic glue do not use PVC-tape. We use a PE-tape with an acrylic adhesion layer. During the curing of the glue only slight pressure should be applied on the sheet near the bond. Too much pressure will lead to tension and possible cracks in the sheet! Be careful with sheets having parts removed by milling, for example in order to attach below the FTS-panel a wash basin. All inside corners should be rounded with minimal  $R=5$  mm to avoid stress concentration and cracking from the inside of corners!

#### 4.3 Bonding with VHB or PE-foamtapes

Several VHB tapes can be used to adhere FTS to a variety of substrates while still achieving desirable aesthetics. Clear 3M tape 4910 or 4905 are just 2 examples. This tape can be used to attach stone to sealed wood, sealed ceramics, metal, glass and some other plastics. VHB tape is UV stable and can be used in interior and exterior conditions as well in the toughest environmental conditions. This tape provides an excellent seal against moisture, however splices or seams in the tape may require additional sealing. The tape can tolerate some shear extension due to substrate movement from thermal expansion or contraction.

Special surface preparation is absolutely needed before applying VHB tape to an FTS panel. First cleaning with the 50/50 percent solution isopropyl alcohol (IPA) and water. Next the stone surface to be used where the tape will be applied should be primed with -for example- 3M primer 94. Follow the manufacturers directions on how to safely handle and apply this primer. After the area has been primed and is dry, the tape can be applied to the first surface. Only handle the tape by the edges and apply firm pressure to the tape using a roller. Attach the second bonding substrate and apply pressure on the finished joint with a roller. Apply real firm application pressure to the total length of the taped area to develop good adhesive contact and to improve the bond strength. Bond strength will increase over time with 90% of the ultimate strength developing after 24 hours and full strength after 3 days. Ultimate bond strength can be achieved more quickly by exposure to higher temperatures.

If the entire weight of a FTS panel is supported by the VHB tape, a minimum of 50cm<sup>2</sup> should be used for every kilo of material to be supported. Testing is highly recommended, especially when bonding to other nonmetal (porous) substrates.

#### DO

- Seal porous materials like cement and wood before bonding.
- Keep tape clean and handle by the edges.
- Make sure both surfaces are clean and dry.
- Use 50/50 isopropyl/watersolution for metal and plastic surfaces.
- Apply a suitable primer like 3M 94.
- Apply primer to first surface and apply FIRM pressure.
- Remove liner and apply to second surface.
- Apply very firm pressure to the whole bond line.
- Wait 72 hours until tape has reached full adhesion strength.

#### 4.4 Silicone sealants

Acidfree transparent silicone sealant/kit can be used for lamination of Faux Translucent Stone to another transparent surface. Follow the instructions of the silicone-supplier and use if needed a primer. Care should be taken to allow for enough thickness of the silicon layer to allow for the needed difference in expansion and contraction of the different materials due to temperature differences.

We have positive experiences also when using this kind of kit when bonding FTS to non-transparent surfaces. Of course care should be taken - as usual - that both surfaces are flat, clean and dust-free.

Silicon sealants are very useful when making bigger constructions. The parts of the construction should be allowed some space for the expansion and contraction and using silicon kit to join the parts is an elegant and proven way to allow the material to do so.

Silicon kits should not be used underwater or in food contact situations. Also it is not suitable for bonding with surfaces that can corrode like milled aluminium or bare steel. The cure depth of the silicon layer should not exceed 9 mm from the airside.

#### 4.5 High-tack kits

With high-tack kits we do not have enough experience to give a proper advice. Make sure you use high-tack kits which can't be seen through the sheet. These kits are suitable as long as they stay flexible on long term. Of course this flexibility is needed because of differences in coefficients of expansion of the FTS versus the substrate. When the substrate has the same coefficient of expansion or when the application is in an environment with a 100% stable temperature, no flexibility is needed.

#### 5 Warm and cold bending

FTS is NOT suitable for blow-moulding or vacuum forming. To be honest: we did not even try to do so. However cold bending will even happen when you would not like it to happen: using too large surfaces without proper support. See the appendix 1 with the tests and theoretical finite element analysis.

Warm bending using an oven, a mould and/or vacuum equipment can be done. We do not recommend at all to try to bend a radius smaller than 800 mm when using 10 mm thick FTS. Two axis bending: just completely forget it. If a complex shape is needed it is better to ask our production facility to "cast" this shape using some kind of mould.

The procedure we use for 10 mm Faux Alabaster is as below. The main problems are that when heated too high or/and too long the material will change colour a bit. Alabaster will yellow. The other problem is that the material will crack trying to make too small radii at too low a temperature. We do not yet have experience with vacuum tables, maybe this will make smaller radii possible. (We do expect this indeed)

One advantage heat-bending the FTS is that it does not shrink, in contrast to materials as PMMA, PETG or PC.

Procedure for bending 10 mm:

- Do not predrying, is not needed.
- Do full inspection of surface quality and colour, also with light behind the sheet.
- Check colour of different parts to be bended. Are they from the same batch? Identical colours?

- The side that will be directed to the viewer is the side that should be laying on the mould. The backside if on the mould the side that is directed to the viewer. So this decides whether the mould will be positive or negative.
- Make the mould with bend-MDF 8 mm and ribs separated from each other 200 mm max.
- Cover the mould with fabric as used for the inside of gloves (we can supply this).
- Put the mould with the sheet in a preheated electric oven with an even temperature distribution at 110 OC during 35 minutes.
- remove gently from oven.
- check if the sheet completely follows the curve of the mould and is laying in the correct position. If needed, put some well distributed load on it.
- cover the sheet + mould with blankets and avoid rapid cooling. Cool for at least 1 hour.
- it is always a good idea to test the procedure with a cut off before starting the real parts.
- if the quantity to be produced is large then 2 moulds are needed.

Other types of Faux Translucent Stones should behave in the same way. We will test this in the coming period and constantly update this document, which will be on line downloadable from the FTS part of our site.

## 6 Larger constructions

We highly recommend larger translucent constructions of FTS to be fabricated by companies having experience in this field.

However, we can mention a few aspects might you prefer to develop your own professionalism in this.

Thickness of the FTS, vertical applications, support free, should be 6 mm 500 mm height / 8 mm by 750 mm / 10 mm by 1000 mm. (Depending also on the weight applied on top of the sheet or other application-dependent variables...test!)

Above this the sheet should be supported on the back side each 1200 mm by a vertical beam of translucent acrylic (not transparent! Use a 80% transmission type) ca. 15 x 50 mm minimum, glued with an acrylic glue - either 2 component or 1 component - on the back of the FTS. Take care: parts should be at least 48 hours in the same room in order to be balanced before gluing them together.

For horizontal applications, we recommend full surface gluing (or taping) of the FTS to transparent acrylic of minimum the same thickness as the translucent stone. For 6 mm FTS the max recommended span without support is 400 mm, for 8 mm this is 500 mm and for 10 mm this is 650 mm. Of course, the way the material is used (loaded) is the crucial factor determining the choice of the max. span. See also the appendix 1. The gluing procedure is quite complex and involves safety precautions. We use Acryfix 190 2 component glue and glue the stone horizontally on a 100 mm oversized acrylic sheet. (50 mm each side) This is full-surface gluing. The result is very good.

Non-translucent constructions are easier. Do not forget the well known expansion / contraction, the use of a kit that is not visible thru the stone, the use of a substrate that does not influence the colour of the stone, take care with inside corners, work clean, use tape, put enough pressure on the sheet etc. In fact, you could use any instruction for solid surface material like Corian or LG also for the faux translucent stone.



## 7 Printing or silk screening

Best is to test the adhesion of the ink used. We do have excellent experiences with flat-bed UV- and not-UV printing and also screen-printing. As there are a lot of different inks and hardening-systems no testing is advised. Substrate should be cleaned as described in the section for gluing.

## 8 Use of LEDs behind

As stated earlier, we have the best experience with LED-cells with a batwing shaped light pattern. We realised a distance of 80 mm while the LED-cells had a distance LED-to-LED of 150 mm on a rectangular matrix. Also here: as different FTS-ses have different transmission and diffusion-characteristics a small test is needed. However, do not expect any complex problems when backlighting FTS. The results with a proper installed lighting are great!

## 9 Certifications

Fire behavior

Bs1do according to (N)EN 13501, tested by Peutz Laboratory for Firesafety April 2016. Material can be used safe everywhere.

### Food safety

samples have been tested by Merieux NutriSciences June 2016. Material approved according to directive 10/2011: EC 1935/2004 and EC 023/2006.

Disclaimer: as usual with this kind of documents: the text above is made in all honesty and we really try to help you getting good results when fabricating our material. But: it is your own responsibility, fully, in all aspects and dimensions, and in relation to all regulations and laws. Convince yourself that what you do, how you do it and the tools and equipment you use are safe and fit for the intended purpose.

Appendix 1: Testing the deflexion and finite element analysis.

## Appendix 1

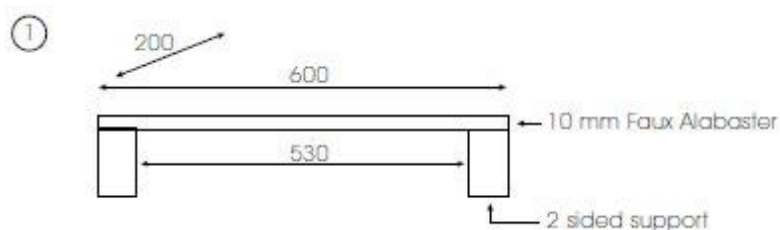
### 1.1 Measurements

We start with flat sheets.

#### Setup 1:

10 mm Faux Alabaster, 200 x 600 mm, both short ends supported. Free over 530 mm.

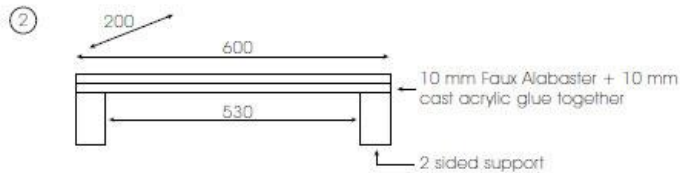
Result with no load after 1 week at 21°C: 1 mm deflection. Long term expectation 2 mm.



**Setup 2:**

10 mm Faux Alabaster + 10 mm cast acrylic, 200 x 600 mm, “glued” using 7 strips 10 mm wide 0.5 mm thick 3M clear VHB tape, both short end supported. Free over 530 mm.

Result with no load after 1 week at 21°C: 0.3 mm deflection. Long term expectation 0.6 mm.

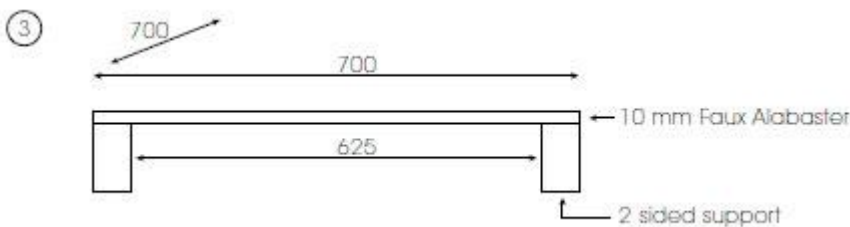


**Setup 3:**

10 mm Faux Alabaster, 700 x 700 mm, 2 sides supported. Free over 625 mm.

Result with no load after 1 week at 21°C: 1mm deflection, long term 2 mm.

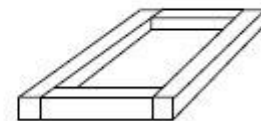
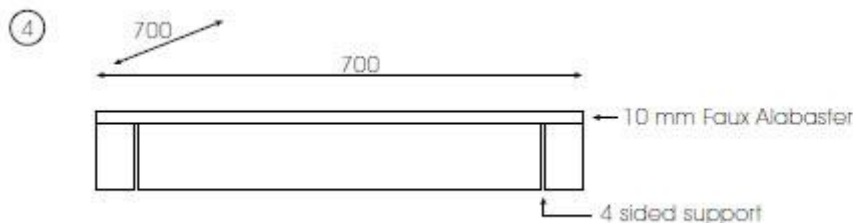
Result with 8 kg load in middle of sheet: after 2 days 1.5 mm extra deflection. Long term 3 mm extra deflection, giving a total of 5 mm.



**Setup 4:**

same as 3 mm, but 4 sides supported.

No deflection. Long term maybe 1 mm.

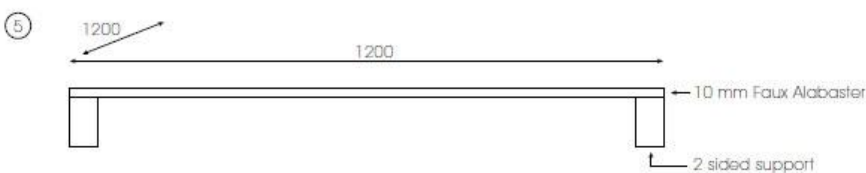


**Setup 5:**

10 mm Faux Alabaster, 1200 x 1200 mm, both sides supported, free over 1130 mm.

Result with no load 6 mm deflection. Long term expectation is double!

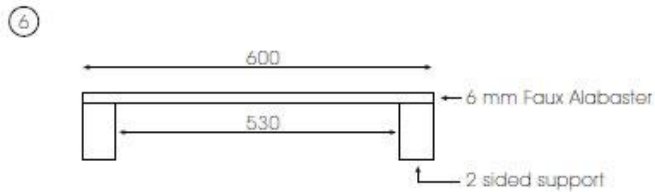
Result with 11 kg load in middle: after 2 days extra 5 mm. Long term extra 10 mm!



### Setup 6:

6 mm Faux Alabaster, 600 x 600 mm, both sides supported, free over 530 mm.

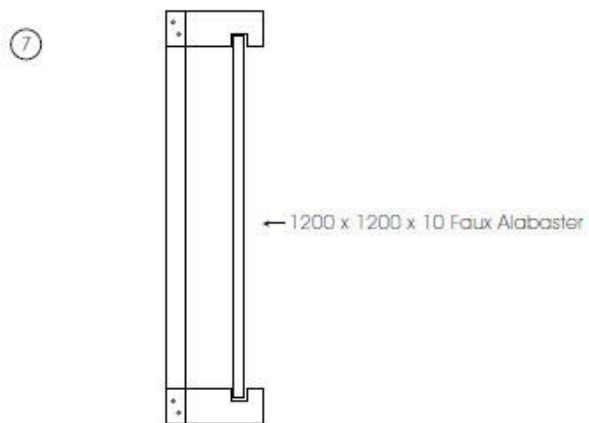
Result with no load after 1 week at 21oC 1 mm deflection. Long term 2 a 3 mm.



### Setup 7

is a vertical sheet 10 mm Faux Alabaster 1200 x 1200, supported bottom and top.

After 1 week still fully flat, no load.



Conclusion: 2-sided support, 650 mm wide seems to be a practical limit for a horizontal surface without constant load for a 10mm thick sheet. Long term expectation 3 mm.

Additional testing has been done with a 10kg block of lead in the centre of setups 5 and 6. After 14 days both setups in final test fail, material breaks. In second test no failure. Conclusion: Faux translucent stone is NOT suitable, even fail, when used with heavy concentrated loads. Do never use it as a bar top or counter with something heavy on it without proper additional support!

## 1.2 Deflection using Finite Element Analysis

The amount of deflection is largely controlled by load, size, thickness and support structure. Three options are fully framed support, simple support and point support.

We investigated flat horizontal panels thickness 10 mm. Vertical panels will not experience deflection if supported properly with no loads. Best way for using vertical panels is to have them fully fixed at the top and fixed at other points (halve-way) and at the bottom with some possibility for movement in the vertical direction (temperature-differences). A vertical panel not supported by the top of the panel may sag.

### 1.2.1 Fully framed support condition in 4 sided frame 25 mm

In a fully framed application (figure 1 and 2) FTS panels 10 mm thickness are fixed around the entire perimeter of the panel. The edge is fixed with a frame or adhesive bonding a shown in figure 2.

Deflection of the panel is entirely dependent on the shortest side of the FTS. So, a panel of 500 x 1000 mm will exhibit the same deflection as a panel 500 x 500 mm. The amount of edge capturing is of course also of influence.

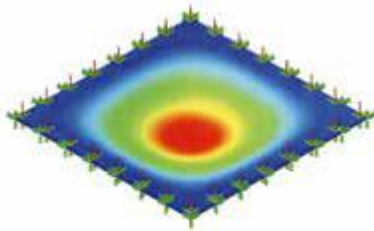
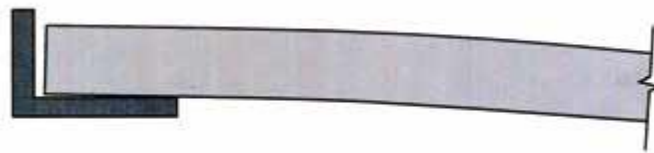
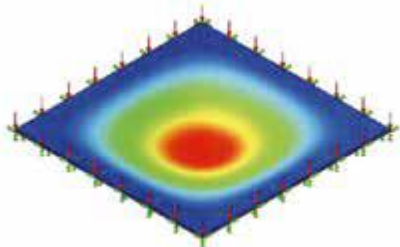
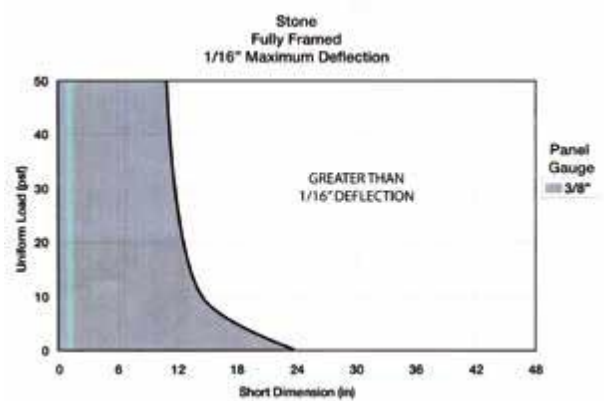
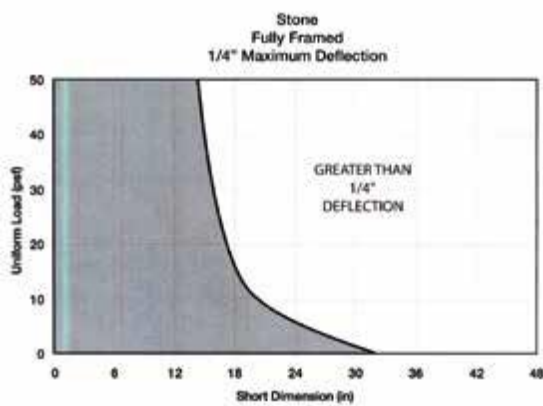


Figure 2. Fully framed deflection cross-section

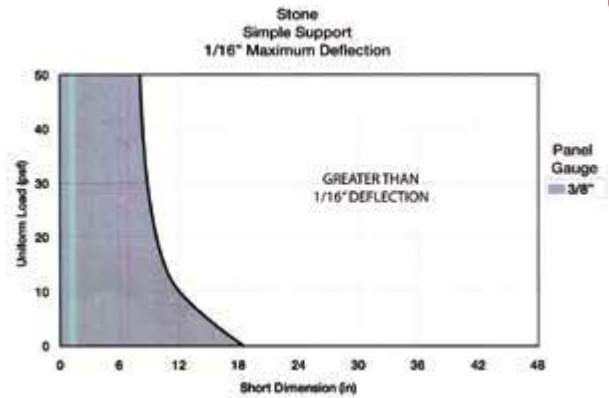
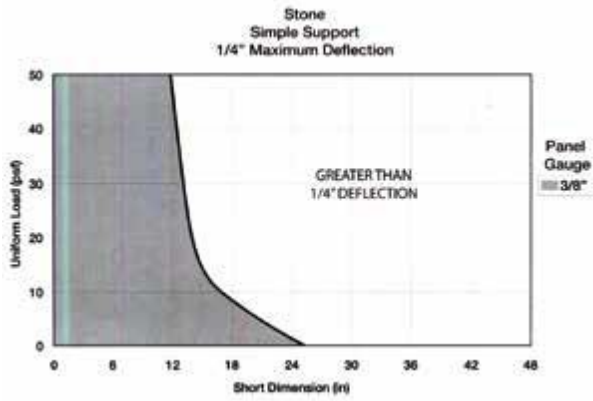
Clear from the first chart is that a sheet with smallest dimension 500mm (free over 450mm) will deflect 6 mm with a load of 50 kg/m<sup>2</sup> (or 25 kg/m<sup>2</sup> evenly distributed over a length of 1000 mm with this sheet 500mm wide). With a 100 kg/m<sup>2</sup> load a 450 wide sheet will deflect 6 mm.



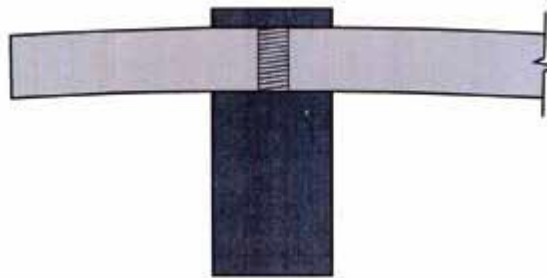
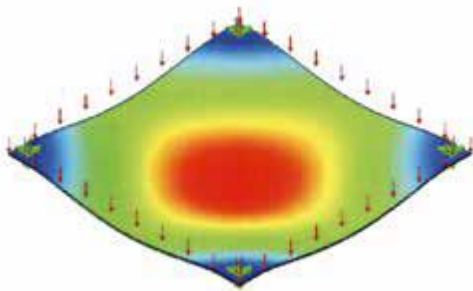
If we want to limit the deflection to 1.5 mm the sheet will be 350 mm wide with 50 kg/m<sup>2</sup> and even 300 mm wide with 100 kg/m<sup>2</sup>. The load is to be assumed uniform over the full surface of the sheet.

### 1.2.2 Simple support condition on 4 sided frame 25 mm

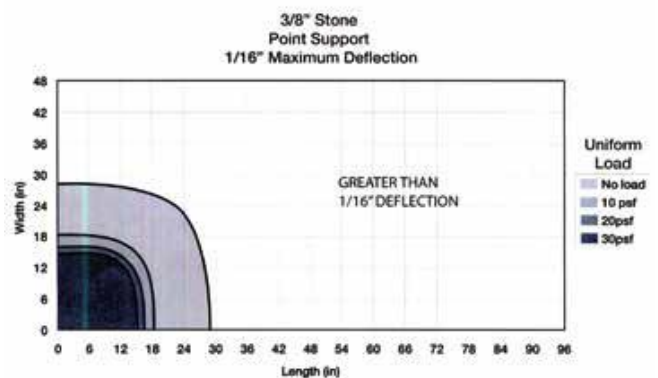
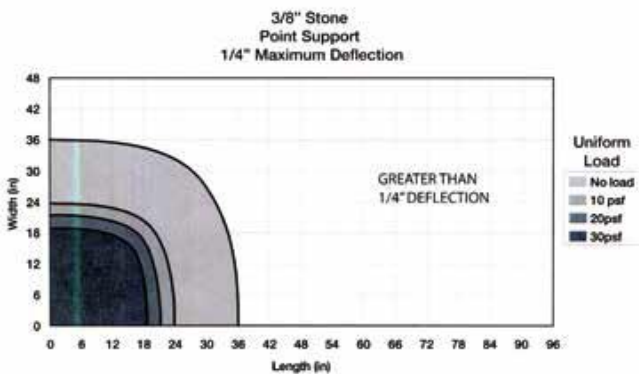
FTS panels in this situation are supported but not fixed around the perimeter of the sheet.



This type of support is commonly used for ceiling panels that are installed into support grids. The edge of the panel is it fixed as shown in figure 4. Deflection of also simple supported panels is entirely dependent on the shortest side of the FTS.



see that a sheet 10 mm thickness with smallest dimension 400mm (free over 350 mm) will deflect 6 mm under a load of 50 kg/m<sup>2</sup>. Limiting the acceptable deflection to 1.5 mm a sheet 300 mm wide (250 mm free) will deflect 1.5 mm with a load of 50 kg/m<sup>2</sup>. Double the load and the max sheetwidth will be less then 250 mm.



### 1.2.3 Point support

FTS panels in point-support condition are fixed at the 4 corners using a 25 mm cap and barrel. As the amount of support is minimal as compared to a 4-sided supported panel, point-supported panels are

more susceptible to deflection. Unlike fully supported panels the deflection of a point-supported panel is dependent on all dimensions of the panel. A 500 x 1000 mm panel will deflect considerably more than a 500 x 500 mm panel. Of course the diameter of the support and the location influence the deflection. In our calculations the supports were located on 50 mm from each edge of the panel.

It is important to note that panels fixed with point-supports suspended from cables will exhibit more deflection than panels supported by point-supports using threaded rod. This latter is more rigid and prevent lateral movement of the panel at the support location.