



Float Glass

What is float glass?

Float glass is common window glass. It's called float glass because it's made by pouring molten glass onto a bed of molten tin – unlike art glass that is made by pouring the molten glass out onto a steel table and rolling it out. Previous to the invention of float glass, window glass was made the same way as art glass and was called plate glass.

Because it's produced in much larger quantities than colored art glass, float glass costs much less. It's sometimes even available free as scrap.

Coloured Float

Although float glass is most often clear, it's also available in various tints of bronze or gray.

Adding Color

Clear glass can produce especially elegant glass art but if you want to add colors, there are lots of options for you to consider:

- Float compatible enamel powders
- Float compatible frit
- High fire paints
- Alcohol inks

Some powders, frits and enamels will react to the tin side of float glass. You'll get more consistent and more reliable results if your fire them applied to the air side. Some sources for materials to use with float glass:

www.armstrongglass.com
www.fusionheadquarters.com
www.thompsonenamel.com
www.uniqueglasscolors.com
www.youghioghennyglass.com

Thickness

The thinnest float glass is 1mm thick but it's extremely rare and very difficult to find. 2mm thick glass is popular for picture framing. The most common window glass is 3mm but it is also available in a variety of greater thicknesses. For art projects where 6mm thick glass is desired, instead of fusing together 2 layers of 3mm glass, artisans often prefer to start with 6mm thick glass. For special projects, much thicker glass allows for unique effects. 12mm thick glass is popular for deep carve sandblasting and for special kiln casting effects.

Compatibility

The COE of float glass can vary from 82 to 86 depending on the glass maker and even depending on different production runs from the same glass maker. You can only trust it to be compatible if you use only glass from the same original sheet but **NOT** if you mix pieces from different sheets. Artisans that use a lot of float glass like to buy full cases so they can expect all the glass to be from the same production run and therefore fully compatible.

Devitrification

Float glass is especially susceptible to devitrification (commonly called "devit"). This appears as a milky foggy haze on the top surface of the glass. Glass molecules heated in the kiln crystallize causing the glass to become opaque and brittle. Some artisans like the appearance of devit but most consider it undesirable and unattractive. An effective way to reduce the likelihood of devit is to fuse glass with the tin side facing up. Fired this way, your project is more likely to have a clear shiny finish.



Float Glass

An easy way to remember which side to place up is to remind yourself to “TUP it” – tin up.

Preventing Devitrification

If your projects designs requires firing tin side down, using a devitrification spray (like Spray A or Super Spray) will help.

WARNING – some devitrification sprays contain lead or chemicals that will make your project unsafe for contact with food. Check what you’re using before assuming it will be food safe.

An effective and inexpensive devitrification spray you can make yourself is to just dissolve borax in water and either brush or spray it on the glass. Be sure to get a thorough coating.

You can also eliminate devitrification by completely covering the air side of the glass with sifted frit, confetti, powder or mica.

Tin Side Testing

When the molten glass is poured onto the molten tin, some tin is absorbed into the glass. This causes an invisible haze on the surface of the glass that floated on the tin and is referred to as the “tin side”. The side of the glass that was facing up is referred to as the “air side”. When you fire float glass in a kiln the results can be affected by whether the tin side was fired facing up or facing down. To be able to control results, you will want to test to identify which is the tin side and which is the air side.

Ways to Test for Tin Side

Short Wave UV - With a short wave ultraviolet light (flashlight, fluorescent bulb, etc.) shine the light through the glass at a 45° angle. If you have the tin side of the glass facing down, you’ll see a slight blue-white fluorescence on the tin side and a purplish shine on the air side. Turn the glass over and repeat the test to confirm which is the tin side.

NOTE – this does not work long wave UV – the kind discos used to make white shirts look purple. It requires short wave UV – the kind made specially for curing UV glue or for germicidal use.

Turning the off all other lights will help you make an accurate test.

WARNING – when doing this test **DO NOT** look directly at the UV light source. Exposure to UV light can cause serious vision problems.

Water drop test - Thoroughly clean both sides of the glass. Drop a single drop of water onto the glass and watch how much the water drop spreads out or thins out. Repeat this on the other side of the glass and compare what happened on each different side. The water drop will spread out and thin out more on the air side than on the tin side.

Touch test - Some claim they can identify tin side by touch because the air side feels smoother than the tin side. I haven’t been able to feel any difference but maybe it’s just a kind of zen experience. Maybe I just don’t have sufficient zen to make it work?

Taste test - I’ve heard claims you can identify tin side by taste. Apparently the tin side has a more metallic taste. I tried this. Other than feeling like a fool licking a piece of glass, I couldn’t tell the difference. Maybe others have more sensitive taste buds.

Firing Test - Probably the most consistently reliable way to identify tin side is by firing in the kiln.



Float Glass

Cut two small pieces or strips off the original pieces of glass. Mark one piece to identify it and turn it over. Fire both together in your kiln to 1450° F (788°C). You could do this test firing in the same load as a full fuse firing. The tin side will remain clear and the air side have a foggy haze.

Horticultural Glass

Some clear glass is not float glass but is instead horticultural glass. It is made by rolling out the molten glass the same way art glass is made so has no tin side. Horticultural glass is extremely prone to devitrification. You might want to check with your supplier to be sure you are getting float glass and not horticultural glass.

Tempered Glass

You can untemper glass by firing in your kiln to 1100° F (595° C). You can't cut tempered glass into smaller pieces and it's pretty hard to break but if you give the corner of the sheet a sharp tap with a hammer, it'll break (more like explode) into little pieces about the size of a pencil eraser. These can be tack fused together to make some interesting and attractive projects.

Tin Bloom

Tin bloom appears as a white discoloration on the tin side of the glass and is often mistaken for devitrification. It often appears looking like stretch marks between the foggy frosted areas.

Firing Schedules

Because float glass has such a wide variance in COE and in materials consistency, it's not possible to provide firing schedules that can be trusted for all float projects. Glass from different glass makers will require slight differences and glass of difference thickness even more differences. Float glass is stiffer than art glass so is slower to soften and requires higher temperatures. Most artisans that work with float glass use basically the same firing schedules as for art glass and just allow for higher performance temperature and higher annealing point:

- Slump or drape – same but longer hold.
- Tack fuse - 1425°F (775°C)
- Anneal between 1080° F (580°C)

NOTE.... It is a common practice to round off F temperatures to make it easy to remember numbers. The numbers provided here for C temperature are not direct accurate conversions but are instead rounded off the same way to make it easy to remember them.

Found Glass

Shops that sell glass and mirror discard a lot of float glass as scrap and may be willing to sell it to you cheap even donate it. When you're scrounging for discards, it's a good thing to demonstrate gratitude. If you ask them to set scraps aside for you, make a point of bringing something. Home baked cookies or muffins are always appreciated. If you can't cook, buy a box of donuts for the shop. Perhaps even a sample of what you make with the glass they give you. Show your appreciation for their help.