Screen Melts

Introduction

There are two terrific reasons for melting glass through screens. First because screen melts produce uniquely intricate patterns not possible any other way and second because it does it using scraps or discards from failed projects. You use scrap to make art.

Selecting Screen Material

Stainless steel. Only stainless steel. Don't even consider anything else. Carbon steel can't be trusted to not soften and anything galvanized will produce noxious fumes that will permanently contaminate both the glass and the kiln bricks. NEVER EVER fire galvanized metal in your kiln.

The smaller the mesh size, the more intricate a pattern will be formed as the glass melts. However, the thick viscosity of glass limits how small a hole glass will melt through. Trying to melt through mesh with holes smaller than 1/4" will leave most of the glass on the top of the screen with lots of glass stalagmites standing up on your kiln shelf and even more glass stalactites dripping down through the screen. Pretty, but not especially useful.

When selecting how thick the mesh is, remember that just as glass softens when it's heated, so does metal. A screen that can easily hold the load of glass at room temperature might soften and bend during firing. Opening the kiln and finding your screen folded like a taco shell melted inside the glass can be pretty disappointing. Use a screen with heavy enough gauge to resist sagging.

Using some kind of extra support along the edges of the screen will make a huge difference in preventing the screen from sagging. It can be heavy metal wire or bars, a metal ring or mold, strips of ceramic, kiln posts, or vermiculite board. Anything that will carry the glass without sagging and can stand up to the temperatures needed to melt glass.

Low grade stainless steel will spall more and soften more than high grade. Higher grade metal can also be used more times than lower grade. Problem is, the higher the grade, the higher the cost. Everybody has to choose their own compromise between cost and quality depending on how many times they expect to reuse the screen.

Prefire Before Using

You should kiln fire your screen melt before using it to remove any residual oil or contaminants left from production. Fire it to at least 1000°F (515C) then allow it to cool. If you remove it from the kiln too early, remember that your kiln thermocouple reads air temperature. The metal will be much hotter. Wear gloves.

Spalling

Spalling is little bits of metal that flakes off metal after being heated. It looks like metallic dandruff. You'll get a lot of it on the first firing and small amounts with each firing. Don't worry, this happens as the metal cools and after the glass has solidified. It isn't stuck in the glass and just brushes off.

Kiln Shelf

Because screen melts are firing much hotter and much longer than is usual for full fuse firings, the possibility of glass sticking to kiln shelves or molds is much greater. Ceramic fiber paper is exceptional as a base to melt on but will leave a quite rough texture on the underside of the melt that will take considerable grinding to remove. "Thinfire" type kiln paper should NEVER be

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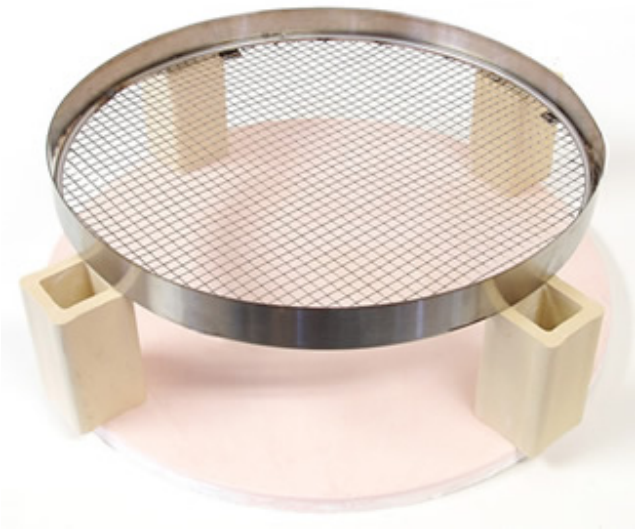
used. The dripping glass is moving on the shelf and will tear the paper leaving bits of it permanently embedded inside the finished melt. Most glass artisans prefer kiln wash. It will often stick to the underside of the melt but can be easily scrubbed off with a wire brush or sanded off (silicone carbide or diamonds) Rubbing a little vinegar onto stuck kiln wash helps break it down and make it easier to remove. Opal glass is a lot more likely to stick than transparent glass.

Selecting Molds

You can melt directly onto your kiln shelf, or, if you want to control the shape and size of your melt, into a mold. It can be metal, clay, or vermiculite or ceramic fiber board. Melting into a drop ring works well. Melting into a clay saucer (like used for flower pots) or a shallow ceramic tray will work but clay or ceramic can't always be trusted to not crack during the high temperature melt. Best is stainless steel.

Screen melt "System" with steel legs holding screen melt and supporting frame elevated over steel containment mold to melt glass into.



Screen mesh with support ring on kiln posts.

Preparing the Molds

If you're using clay or ceramic, you can coat it with kiln wash to prevent the glass from sticking but because glass kiln wash wasn't intended for the higher temperatures used for melts, you will get considerable kiln wash stuck to the glass. DO NOT use "thinfire" type kiln paper. It will tear and embed in the molten glass. DO NOT use Boron Nitride. It DOES NOT WORK at melt temperatures.

The ideal mold material is stainless steel. You have to use something to prevent the metal from sticking to the glass. Do not use kiln wash. The metal mold contracts quicker than the glass and will seal so tightly against the glass you'll have to break the glass to get the mold off. The ideal material is ceramic fiber paper. It will prevent the glass from sticking to the mold and provide enough soft cushion to easily allow the glass to release from the mold.

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Square steel mold lined with ceramic fiber paper.

Glass Selection

Minimize use of dark colors (especially black) that will overpower other colors. Use about half as much dark as you think will look right and twice as much light or clear. Using a lot of clear in your melt will allow you to more easily see the fascinating patterns formed inside the melt.

Avoid using too many large pieces. Small pieces or long thin strips produce a more interesting pattern than large pieces. Melts look the most attractive when there is a delicate mix of colors.

Measuring Glass Volume

You can predetermine what size your melt will be by the weight of the glass you put on the screen to be melted:

- 8 in. diameter use 800 grams (30 oz)
- 12 in. diameter use 1500 grams (55 oz)
- 8 in. square use 900 grams (35 oz)
- 12 in. square use 1600 grams (60 oz)

Remember ….. not all of the glass will melt through the screen Some will be left stuck on the screen. Use a little extra glass to allow for this.

But if you're melting into a mold, it's important to be sure you use enough glass to fully fill the mold but if you use more than is needed to fill the mold, all that will happen is you'll get a melt thicker than 1/4" (6mm). Firing it again to full fuse temperature will bring it down to that thickness (but also spread it out).

Loading the Screen

It's important to carefully stack the glass on the screen to get enough on unless you are using a pretty large screen and only doing a small melt. If you just pile it up, a lot of it will just slide off the edge of the screen and make a big mess with much of it falling where you don't want it to. If you drip molten glass onto the edge of your mold, you may not be able to get it off after.

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Screen melt and supporting ring standing on steel rod support bars standing on kiln posts.

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Firing Screen Melt *

SEGMENT (min)	RAMP	TEMP	HOLD
1	800F (425C)	1600F (870C)	90
2	FULL	1475F (800C)	30
3	FULL	960F (515C)	60
4	200F (95C)	750F (400C)	0
5	300F (150C0	300F (150C)	0

You will have to take the glass up to 1600F to be hot enough to fully melt and hold long enough to drip through the screen. The hold at 1460F full fuse temperature is to help remove glass from the screen.

Firing Screen Melt 2nd Firing *

SEGMENT (min)	RAMP	TEMP	HOLD
1	200F (95C)	1000F (515C)	20
2	800F (425C)	1475F (800C)	30
3	FULL	960F (515C)	60
4	300F (150C)	300F (150C0	0

You will have a few pits and spikes in the melt and rough edges from where the glass contacted the mold. Grind off the edges to create a uniform edge.
Fire to full fuse temperature with a long hold to remove the spikes and pits and fire polish the edge.

This firing schedule applies for a 12” or smaller melt. For larger melts, install a bubble squeeze between segments 1 & 2.

Slumping Screen Melt *

SEGMENT (min)	RAMP	TEMP	HOLD
1	200F (95C)	1000F (515C)	20
2	800F (425C)	1250F (675C)	20
3	FULL	960F (515C)	60
4	300F (150C)	300F (150C)	0

This firing schedule applies for a 12” or smaller melt. For larger melts, install a bubble squeeze between segments 1 & 2.

- **Firing schedules are for COE 96 glass. If you use COE 90, add 25F to all temperatures.**

Reusing the Screen

Not all the glass will melt through the screen. Some will be left stuck in the mesh. To reuse your screen for more firings, you can either just use it as it is and let the residue from the previous firing join in the new firings or you can break out the residual glass by smashing the screen with a hammer. Don’t smash it too hard or you’ll damage the metal mesh. Just hard enough to break out the glass. Be patient. It takes a few minutes to break it all out.

Instead of cleaning out their screens to reuse them, many glass artisans have opted to have multiple screens for various color themes so they don’t need to be concerned about color contamination in different melts.

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Screen loaded with scrap from failed projects.

Screen after melting into round mold.

Some Screen Melts