
THE PAUL WISSMACH GLASS CO. INC.
90
MFRS.
THE PAUL WISSMACH GLASS CO. INC.
96
MFRS.
Kiln
Glass

Transparent
Sheet Glass COE 90

Before firing ***Single layer*** ***Color on clear*** ***2 layers of same color***

90-04 Light Blue

90-10 Orange/Red

90-05 Light Green

90-11 Bright Green

90-06 Coral (striker)

90-12 Bright Blue

90-07 Light Grey

90-13 Dark Red

90-08 Light Amber

90-16 Champagne (striker)

90-01 Clear

90-09 Violet

90-17 Yellow

For Wissmach Sheet Glass Options like coating refer to p. 6 and 7, textures p. 8 and sheet sizes, thickness on p. 9.

Opaque

Sheet Glass COE 90

Before firing ***Color after firing***

90-02 Black

90-03 White

90-14 Orange Red

90-15 Yellow

Wissmach Opaque 90 Tower by Petra Kaiser

Prisma

Prisma is our fusing line of mixed colors. Primarily a mix of 2 colors and sometimes 3, which can result in some additional color hues. Mixing color is a manual process and each piece will be different. Some are so interesting that you might just want to use it as a whole piece to create something beautiful.

90-18
Black/Crystal

90-22
Yellow tr./Crystal

90-19
Red tr./Crystal

90-23
White 75%/Crystal

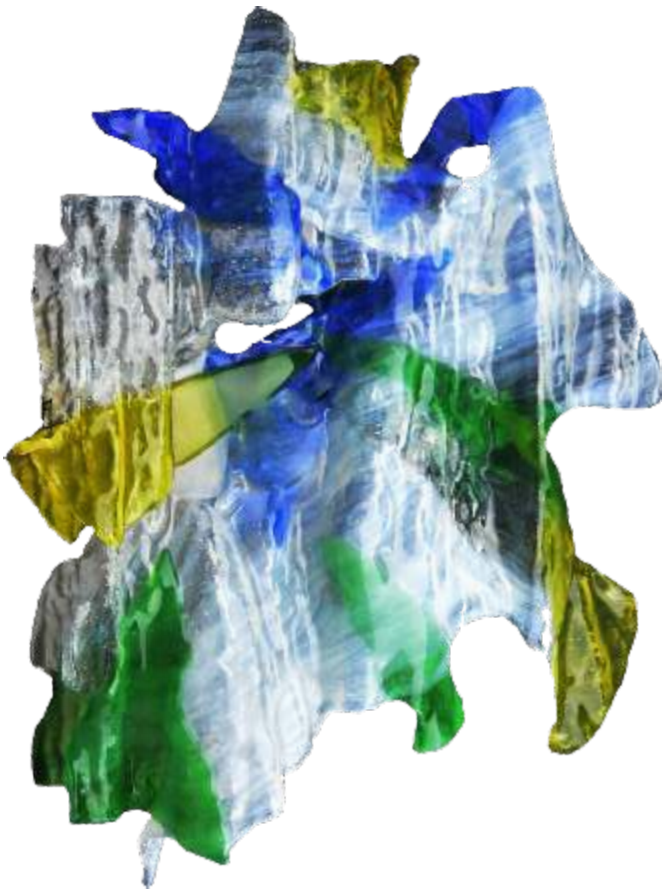
90-20
Red tr./Yellow tr.

90-24
Blue tr./Crystal

90-21
Yellow tr./White

90-25
Green tr./Crystal

*tr. stands for transparent



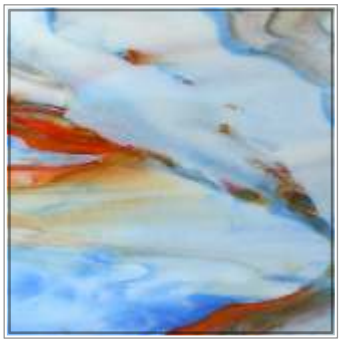
Prisma

90-30
Green tr/White

90-33
Bright Blue tr./White

90-26
Grey tr./White

90-28
Red tr./White



90-31
White/Blue tr./Red tr.

90-34
White 50%/Crystal

90-27
Green tr./Blue tr.

90-29
Blue tr./White

90-32
Bright Green tr./White

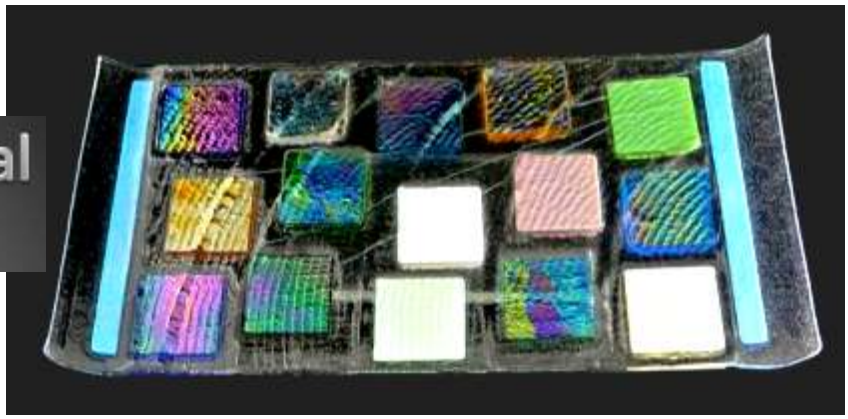
90-35
Crystal/White 25%

*tr. stands for transparent

All of our colors are available with our Luminescent coating.
Our coated glass is similar to the iridescent coatings, but not quite the same. Therefore, we call it luminescent.

You can achieve different effects when firing with the coated side up or down. It is ideal for reversed fusing projects and sculptures which you want to look their best from both sides.

Luminescent Glass Tutorial
Please visit: Wissmachglass.com/FreeTutorials



Luminescent coated glass - coated side fired down!

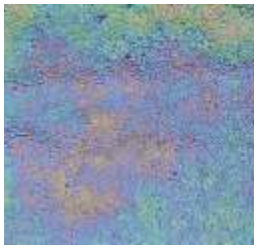
Below you see a few **sample tiles** to give you an idea of the color. All tiles were fused luminescent side towards the kiln shelf.


90-04-LU Light Blue


90-06-LU Champagne


90-11-LU Bright Green


90-05-LU Light Green

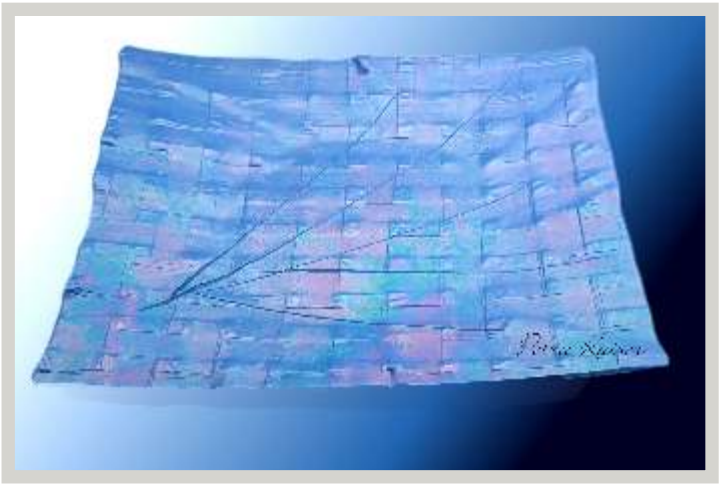

90-02-LU Black


Rustic by
Gail A. Price

I've been in love with Wissmach luminescent glass for several years. The beautiful sheen is mesmerizing. Everybody wanted one of my pieces! I've given many as gifts. Last fall my Rustic Bowl received the Second Place Ribbon for fused glass art at the Arizona State Fair!
Best to You, Gail A. Price

"Putting It All Together" is a workshop taught by Cyndi Seeberger, at Hollander Glass Texas. This Zebra bowl is stunning in real life. The shimmering mottled coating of Wissmach Luminescent glass is like none other."


Zebra Bowl, WI 96-03-LU, by Cyndi Seeberger



Luminescent Project!

This small project lesson will give you a head start on using our luminescent glass. You should fire the glass luminescent side towards the kiln shelf or towards the mold. For that reason we developed some reverse fusing molds. Kaiser- Lee Board is a fiber board that is easy to cut and carve and therefore will make ideal long lasting molds for this technique.

Ok, let's have a look at a real project which is named "**Ostrich Plate".**

Step 1: Choose a mold - in this case we are using a reverse Kaiser Lee Board mold with a pattern created with Papyros Paper. (Yes , you can find it on YouTube).

Step 2: Choose a piece of glass, we used a 96-14 reactive blue, luminescent - 9" x 9" and placed it luminescent side down onto the mold.

Step 3: Cut a piece of 4" x 4" square 96-02 black luminescent and place it luminescent side up on the back of the plate. This will not be seen from the front, just adds a little surprise, when people turn over the plate.

Step 4: To preserve the luminescent coating on the black glass, I added some cut out shapes of Papyros Paper™ which will protect the luminescent where it is placed on the glass.

Step 5: On a Kaiser Lee Board mold you can full fuse and slump in one firing. In our kiln we used the following schedule:

You can use our luminescent coated glass to create different effects depending on the way *YOU FIRE IT!*

Wissmach luminescent coating is a *low fire coating*. But with a few tricks you can use it as a beautiful design element.

First Rule: When you cap the luminescent coating with another piece of glass you will lose it. This can be used as a subtle design element, by capping it partly with shapes of clear glass.

Second Rule: Avoid direct heat to the coated side. Even when you fire the coated side down, hot air could expand between your kiln washed shelf/mold and the glass. In most cases it helps when you use a shelf paper between glass and mold/shelf.

Please read through the project lesson and you will understand. We also have a luminescent video on our ***YouTube*** *channel.* Search for *"Wissmach glass for your glass art".*

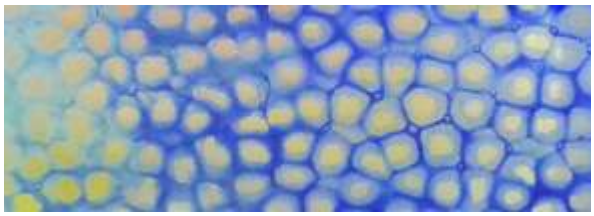
Firing Schedule!

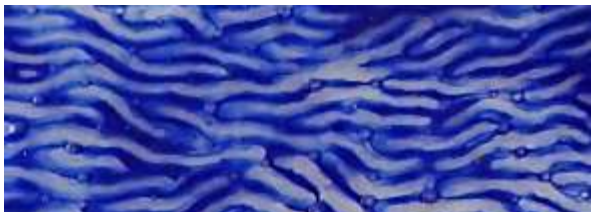
- ► 600°F (300°C) to 1000°F (540°C) hold :10
- ► Full to 1420°F (770°C) hold :10
- ► Full to 900°F (480°C) hold 1:00
- ► 100°F (38°C) to 700°F (370°C) hold :00

Textured Sheet Glass!

Wissmach textured glass comes in 90 and 96

Dichroic coated glass keeps the textured look even in a full fuse firing. You can also keep the textures with the help of glass paints, enamels or mica paints. Visit our You Tube channel for instructions.

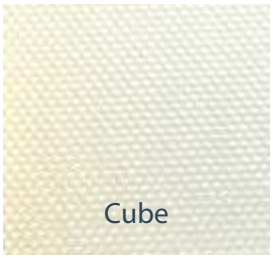




You can use "Dichroic Extract". Howard Sandberg from Coatings by Sandberg (CBS) teaches you on You Tube how to create the design shown in the picture to the right.


Aerolite


Corella Classic


Cube


Dew Drop

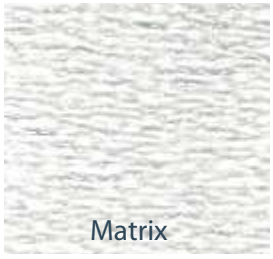

Flemish

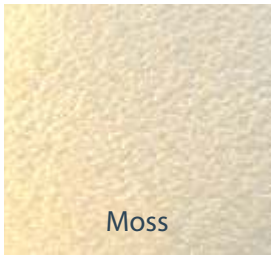

Florentine


Figure C

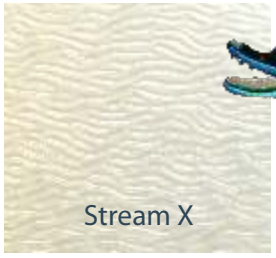

Granite


Hammered


Matrix


Moss

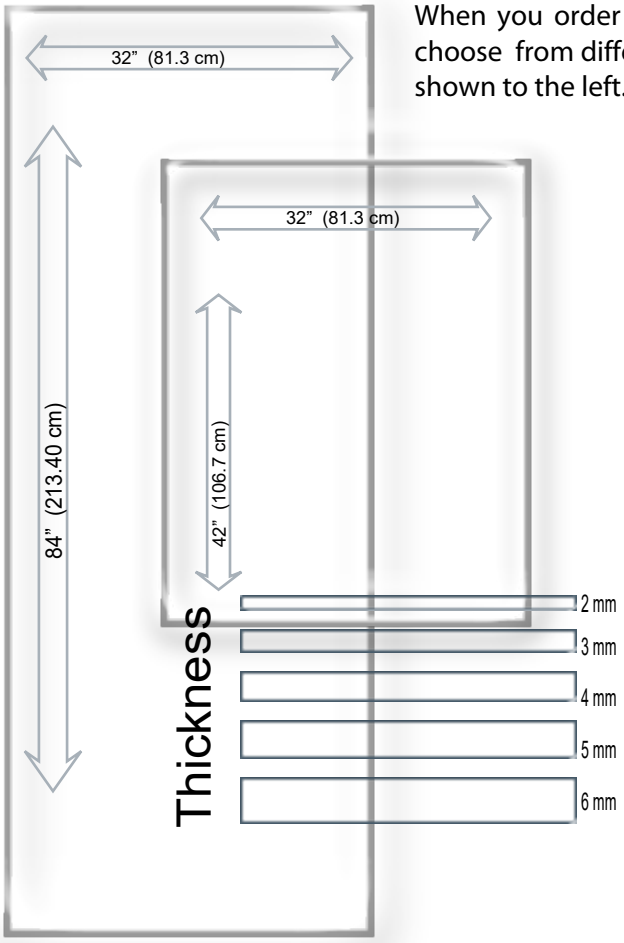

Ripple


Stream X


See you Later
by Karen Pester

Ask your glass supplier for dichroic coated Wissmach glass.
It is easy to cut and fires beautifully.

Sheet Glass Size and Thickness!



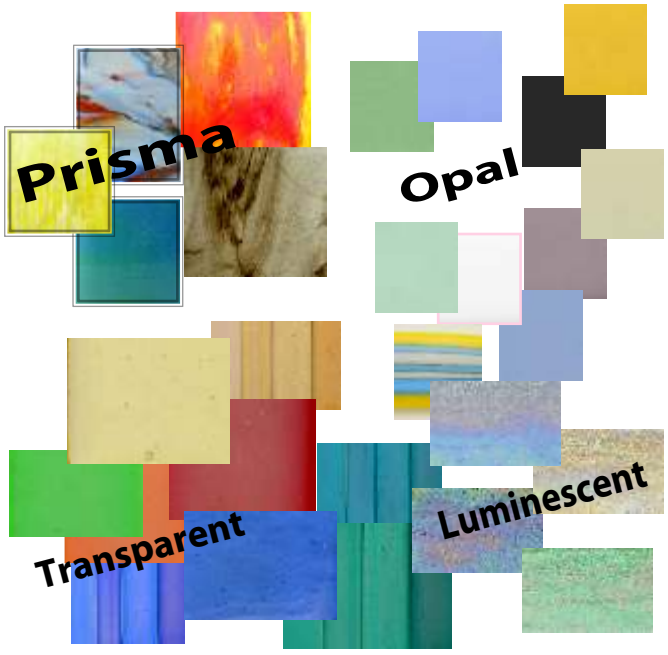
When you order your sheet glass you may choose from different sizes and thickness as shown to the left.

Kiln Glass Variety Boxes!

Our Variety Boxes come in 3 sizes and 4 different glass selections. We offer them in all Wissmach 90 and 96 glass colors through our network of distributors.

Boxes in different Sizes	Studio	Instructor	Student
Glass Size	16" x 16"	11" x 11"	8" x 8"
Standard	10 sheets in a variety of colors		
Deluxe	10 sheets in luminescent		
Basic	10 sheets in black, white and clear		
Prisma	10 sheets of our popular Prisma		

Call your distributor for Pricing!



Wissmach - Glass

One Size Fits All - Firing Schedule

That's only going to happen when all your glass pieces have the same size, shape and color. Never have firing schedules been so slow and hold times so long and when I ask people why, the typical answer is: "Somebody gave it to me and it works". After 2 incidents where people reported the Wissmach white glass cracking after firing I decided to talk to you about firing schedules and their consequences. First I tested the glass in question to see if there is any stress between the white and the clear. And each test so far has shown absolutely no stress.

Then I tried to copy the piece and see if it would crack. But so far so good - I could not get the glass to crack.

I suspected the difference in firing would be the issue and so I went back to books on glass fusing including my own, wondering if I could find a scientific explanation for all my theories when studying those schedules. After several days of research I think I found the scientific explanations I was looking for. The results from my research are explained on the following pages.

Petra Kaiser, Wissmach Kiln Glass Consultant

	Segment or Step	Rate (DPH)* (Speed)	Temperature (Destination)	Soak or Hold in Minutes	Reasoning Do not ask **HOW,** ask **WHY** and bypass generic firing Schedules!
1	**Initial Heat Cycle**	600°F 222°C	1000°F 538°C	:10	Be efficient and heat uniformly to avoid thermal shock
	In an initial **first fuse firing**, where all the glass starts out with layers of 3 mm glass, you can go up between 900°F (482°C) and 600°F (222°C) per hour. The speed depends also on the size of glass. Anything under 12" (30 cm) can be easily heated at the rate of 900°F (482°C) and bigger than 12" (30 cm) you can slow it down to 600°F (222°C) per hour. Let's assume you have already fused a blank and now want to **fuse it again**, or **kiln form** it on a mold, you should slow down the initial heat cycle - and depending on size of the piece you can go up 450°F (232°C) and 300°F (148°C) per hour. Re-firing a cast glass piece of 3/4" (2 cm) thickness I do not go slower than 200°F (93°C). Holding it for 10 minutes at 1000°F (538°C) is sufficient to avoid thermal shock before you advance to the Pre Rapid Heat.				
2	**Pre Rapid Heat Soak**	AFAP***	1210°F 651°C	:15	Optional. No more worries about thermo shock, just equalize temperatures and minimize bubbles.
3	**Rapid Heat to Process Temp.**	AFAP***	1410°F ** 765°C **	:12	Going up fast will avoid devitrification and increases efficiency. Choose the right Process Temperature and Avoid overfiring
	In this part of the firing you decide about your final result and adjust the Time and Temperature for the process like: tack fuse, full fuse, slump drape, casting, combing …. Lower temperatures and longer hold times usually will give you better results. Avoid over firing and undesired results, like kiln wash sticking to glass and shifts in color and transparency, bursting bubbles and even shifts in compatibility. There is a relation between hold time and temperature. You can full fuse glass by holding it for several hours at 1250°F (676°C). So holding it at any stage for an extended amount of time can change the desired results and are unnecessary and inefficient.				

- Firing - Suggestions

.. Wouldn't That Be Nice?

Process Temperatures: These are only starting points. Please adjust the process temperatures to your liking and keep firing notes.

Tack Fuse: 1300°F (704°C)
Fuse: 1410°F (765°C)
Drape Over: 1180°F (637°C)
Slump: 1280°F (693°C)
Cast: 1440°F (782°C)
Combing: 1600°F (871°C)

There is a relation between hold time and temperature. You can full fuse glass by holding it for several hours at 1250°F (676°C). So holding it at any stage for an extended amount of time can change the desired results and are unnecessary and inefficient.

Page 22- 100 - Cookie Cutter Schedules - oops - sorry we will not provide them. With the suggested *Process Temperatures for Wissmach glass* and our Free e-book online you should be able to write your own.

	Segment or Step	Rate (DPH)* (Speed)	Temperature (Destination)	Soak or Hold in Minutes	Reasoning Do not ask **HOW,** ask **WHY** and bypass generic firing Schedules!
4	**Rapid Cool to Anneal Soak**	AFAP***	900°F 482°C	:45	Rapidly go through the devitrification zone. Equalize internal glass temperature before going through the annealing zone.
	During the anneal soak we have to equalize the glass to the point where top middle and bottom have no more than 10°F (5°C) difference in temperature. This is the minimum requirement, before the glass keeps cooling through the Strain Point.				
5	**Anneal Cool**	100°F 38°C	700°F 371°C	:1	Once you are past the strain point the glass will not anneal any more.
	The actual range for the strain point in glass is between 800°F and 880°F. Taking the glass slowly through 700°F is playing it safe.				
6	**Final Cool Down**	Natural Rate	90°F 32°C		Leave the kiln closed to avoid thermal shock.

The complete Firing Suggestions e-book is available for FREE on our website

Wissmachglass.com

Transparent Sheet Glass COE 96

Before firing ***Single layer*** ***Color on clear*** ***2 layers of same col-***

96-01 Clear

96-19 Peacock Feather

96-11 Honey

96-20 Midnight Blue

96-12 Cinnamon

96-13 Deep Sky Blue

96-15 Cornflower Blue

96-16 Sapphire Blue

96-17 Garden Green

96-18 Emerald Coast

Here you see different colors of Wissmach 96 transparent glass fused on top of each other to create new colors.

For Wissmach Sheet Glass Options like coating refer to p. 6 and 7, textures p. 8 and sheet sizes, thickness on p. 9.

Transparent Sheet Glass COE 96


96-43 Sea Blue


96-46 Grey


96-47 Steel Blue


96-50 Turquoise Green


96-51 Orange Red


96-52 Red


96-58 Bronze


96-59 Yellow

This vessel is 14" high and was created at the Fuse It Studio in Cape Coral, FL in collaboration of Petra Kaiser and her student Marshall Paisner.

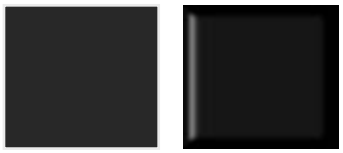
They used a 18" x 10" 96-52 Red Luminescent, a 10" x 10" 96-02 Black and a 10" x 8" 96-01 Clear.

With strips cut into different width and length they created a 23" x 23" flat square piece, which was then draped over 13" high Kaiser Lee Board drape triangle set up.
Visit www.kaiserlee.com for more instructions.

For Wissmach Sheet Glass Options like coating refer to p. 6 and 7, textures p. 8 and sheet sizes, thickness on p. 9.

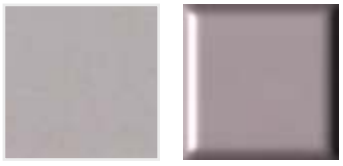
Opaque Sheet Glass COE 96

Our opaque glass gets a beautiful shine in the firing process. Please be aware that the colors can strike a darker hue. Therefore, we show each color unfired (left picture) and fired (right picture).

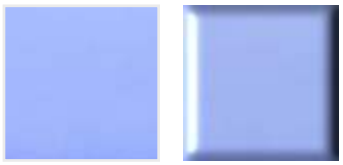


96-02 Black

96-03 White



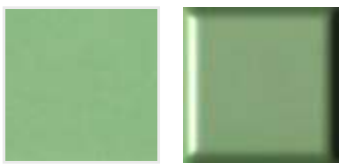
96-04 Classic Violet



96-05 Superior Blue

96-06 Pale Green

96-09 Oyster Pearl

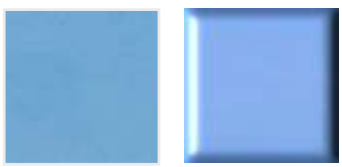


96-07 Olive Green

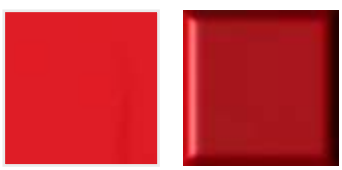
96-10 Gold Tone

96-40 Orange/Red

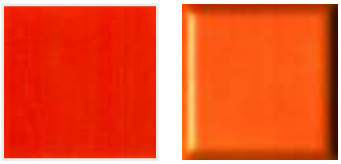
96-08 String of Pearls



96-14 Reactive Blue



96-41 Dark Red



96-42 Orange

Octopus Vessel by Petra Kaiser

If you like to see this Octopus Vessel from different angles to get a better idea of its dimension, please visit our YouTube Channel.

The glass has been full fused with 1/4" wide strips on edge, than sliced with a saw into ¼ " wide pieces to be assembled again on edge with some clear glass strips in between each color strip and full fused a second time. In a third firing it did get its shape.

For Wissmach Sheet Glass Options like coating refer to p. 6 and 7, textures p. 8 and sheet sizes, thickness on p. 9.

Reactive Glass!

In glass fusing we call glass "reactive" when the metals in one glass react with the metals in another and as a result, create a fine darker line where the two colors meet.

When you combine the colors to the left with the colors on the top row, chances are that you will get some nice reactions.

96-08


96-09


96-10


96-42


96-11

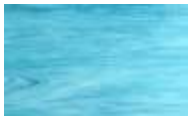

96-12


96-14


96-19


96-38


96-13


96-21


96-22


96-43


96-44


96-45

By Petra Kaiser

By Dave Russin

Dave Russin from Anything in Stained Glass, Frederick MD. Dave says: *"I love the projects made from 96-39 because it keeps reacting"*. 96-39 is a Prisma glass, which is made with 96-08 String of Pearls and 96-14 reactive blue and yes, it will react even more with each firing.

Prisma

Each Prisma combination can come in a variety of color densities as you can see in the following samples.

- 96-28 is White with streaks of Midnight Blue,
- 96-29 is Midnight Blue with streaks of White,
- 96-30 is Midnight Blue with streaks of Crystal.

The first part of the color name is the more dominant color of the Prisma Glass™.

96-21
White/Deep Sky Blue tr.

96-22
Crystal/Deep Sky Blue tr.

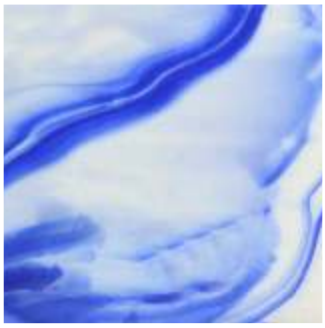
96-23
White/Superior Blue

96-24
Crystal/Superior Blue

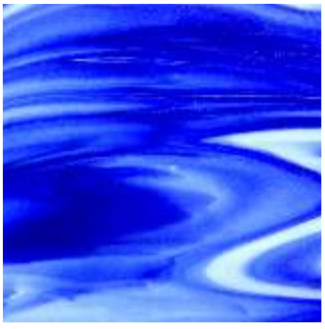
96-25
Crystal/Black

96-26
White/Crystal

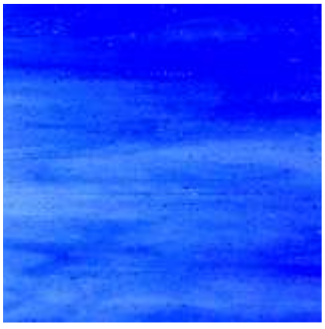
96-27
Crystal/Reactive Blue



96-28
White/Dark Blue tr.



96-29
Dark Blue tr./White



96-30
Crystal/Dark Blue tr.

96-31
White/Violet

96-32
Olive Green/White

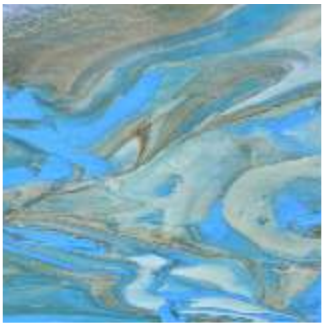
*tr. stands for transparent

96-33
White/Olive Green

96-34
Olive Green/Blue

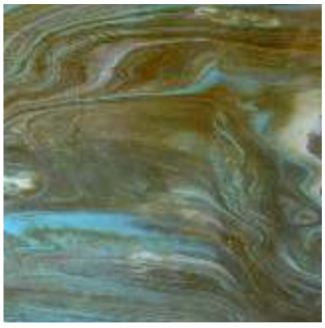
96-35
Blue tr./Olive Green

96-36
Black/Pearl



96-37
Reactive Blue/Oyster Pearl

96-38
Reactive Blue/Black



96-39
Oyster Pearl/Reactive Blue

96-44
Crystal/ Sea Blue tr.

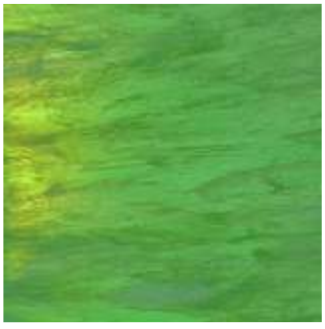
96-45
Sea Blue tr. /Crystal

96-48
White/Steel Blue tr.

96-49
Steel Blue tr./White

96-53
Blue/White

96-54
Honey tr. /White. /Crystal



96-55
Garden Green tr./Crystal/ White

96-56
Crystal/Garden Green

96-57
Crystal/White

*tr. stands for transparent

Ask Your Glass Supplier for Wissmach 96 Glass Frit

Now Available in: 20 Colors, 2 Jar Sizes and 4 Frit Sizes!


Fine


Medium


Coarse


Mosaic


16 oz - 0.5 kg


4 lbs - 2 kg

96-01 Clear
96-02 Black
96-03 White
96-04 Classic Violet
96-06 Pale Green
96-07 Olive Green
96-08 String of Pearls
96-10 Gold Tone
96-11 Honey tr.
96-13 Deep Sky Blue tr.
96-14 Reactive Blue
96-15 Cornflower Blue
96-16 Sapphire Blue
96-17 Garden Green tr.
96-18 Emerald Coast tr.
96-19 Peacock Feather tr.
96-20 Midnight Blue tr.
96-41 Dark Red
96-52 Dark Red tr.
96-59 Yellow Tr.

Currently we are producing Frit in COE 96. We started to make Frit in 2017 and as we are producing glass, we will add more colors to our line of Frit.

Frit Project

Step 1: Take a few random pieces of clear glass and cover them with a thin layer of frit. I used Aloe Vera for the task.

Step 2: Fire your glass at full fuse temperature.

Step 3: Cut the fired glass on the back side into 1/4" (1 cm) wide strips.

Step 4: Assemble them on edge to a rectangle by adding several pieces in one row. You can fill in wide gaps with some clear medium size frit.

Step 5: Full fuse again at your favorite full fuse temperature. Mine is 1410 ° F - 765 ° C and hold for 10 minutes.

Step 6: Place it on an angle on a Kaiser Lee Board drape mold and drape it at 1190°F - 645°C - hold 10 minutes.

Paul Wissmach Glass Company

Paul Wissmach Glass Company manufactures a wide range of colors to please the palette of any artist, architect, or designer - add color mixtures and textures you get more than 3000 possibilities. In over 100 years of glass making we are one of the longest lasting glass companies here in the United States. Most of those years we produced stained glass for cold working techniques.

Bear Candle Shelter by Lisa Vogt
You can find this freestanding project. Follow Lisa's written instructions *in Glass Patterns Quarterly Magazine, Winter 2017* and watch her on https://www.youtube.com/watch?v=_1lFvOsAuyA

You'll love how the candle light brings the *Wissmach Glass* to life and lights up your home with a soft, colourful glow.

Making glass is a hot business, both literally and figuratively. The factory has 14 brick furnaces that use natural gas to heat the limestone, soda ash and sand to 2,200°F (1,200°C). Different mixtures of ingredients create the distinct Wissmach colors. After heating, workers scoop the molten glass from the furnace and wheel it over to the glass press where a roller presses it into one of the 19 patterns that the company produces. The glass then travels down a 125 foot conveyor through a temperature controlled kiln called a lehr. The purpose of the lehr is to anneal the glass, or slowly and evenly cool it, to give the glass its durability and to prevent shattering or heat related breaking. At the end of the conveyor, workers carefully remove the cooled sheet of glass and cut it to the appropriate size.

Sample Sets!

No matter if you are using our glass for architectural purposes or for hot glass applications (COE 90 and COE 96), we recommend you order some glass samples. Please visit: **www.wissmachglass.com** and you will find an order form for our sample packs under "**Resources**"

Stay Connected

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The Paul Wissmach Kiln Glass Catalog 2019 front page art work is an Installation at the New Phoenix Theater in Ft. Myers, FL by Petra Kaiser