



Integral Seal Mfg. Inc.

# ARCHITECTURAL GLASS BROCHURE





# OUR COMPANY

We are motivated by perfection and customer satisfaction, striving to serve our clients effectively in this fast-paced industry. We are always developing unique and custom methods to ensure efficient delivery of exceptional quality glass products.

Integral Seal Manufacturing Inc. was established in Concord, Ontario, in 1995, initially supplying thermal insulated glass units to the Greater Toronto Area (GTA) market. Since then, we've transformed into a key player in the Ontario glass industry, expanding operations into a 50,000 square foot manufacturing and storage facility. Our state of the art facility features Engineered to Order (ETO) software, CNC cutting machines, custom lamination, and automated insulated unit production lines. This modern equipment, coupled with rigorous daily maintenance and a team of dedicated quality control experts, ensures top-tier precision in every product.

We manufacture glass for a diverse array of projects, specializing in the booming condominium sector, where we've contributed to over 100 high-rise buildings in the last decade alone. Our fully equipped facility can handle any project requirement, including unique capabilities like Digital Printing and Laser Etching. Importantly, all our products are certified to meet North American glass regulations for safety and compliance (IGMAC / SGCC).



**Integral Seal Mfg. Inc.**  
Manufacturers of Insulated · Tempered · Laminated Glass

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# INSULATED GLASS

Integral Seal's Insulated Glass Units offer the performance and felxibility necessary to safeguard against hot and cold weather conditions.

It essential to be protected from the elements in Canada as seasonal weather can vary dramatically. Insulated Glass Units (IGUs) are composed of two layers of glass separated by an argon filled gap. This spacer gap reduces the air to air transfer, insulating internal temperatures and creating a barrier from the external elements. We guarantee the quality of all our units, which are certified in compliance with the IGMAC North American regulations.

Insulated Glass Units are most effective when paired with Low-E performance glass and can be customized with various spacer widths. These options help maintain a comfortable living environment while preserving unobstructed views, contributing to lower heating costs in winter and cooling costs in summer. If these solutions do not meet your performance requirements, Integral Seal also offers the option of manufacturing Triple Glazed Units.

## FEATURES

Compatible with Low-E glass to increase performance capabilities of units.

Excellent solar and thermal control to reduce heating costs and air conditioning.

Argon filled glass panel gaps helps reduce outside noise and sound transmission.

Can be combined with digital printing and laminated glass for custom and safety options.

## THICKNESS & SIZE

Custom Thickness', Sizes & Make-ups are all available including Triple Glazed options.

## GLASS TYPES

Clear, Low Iron, Grey, Bronze, Low-E, Acid Etch, Pin Head

\*Custom glass types and tints available on request



## Insulated Glass Unit



## Cutting Edge

Integral Seal remains at the cutting edge of glass technology and employ advanced automatic unit assembly lines. These lines have gained international recognition for both innovation and precision. To ensure that the highest quality is reach all units are double or triple sealed reducing of any unwanted problems in the future.





# TEMPERED GLASS

The perfect safety solution for all occasions Integral Seal's tempered glass can be Laminated, Insulated and even Heat Soaked reducing the risk of spontaneous glass breakage.

Tempered glass is engineered to shatter into small pieces upon breaking, minimizing the risks associated with large, sharp shards. The safety glass is manufactured through a precise technique of extreme heating and rapid cooling, resulting in a stronger and more durable glass. Universally praised Tempered Glass is quickly becoming the standard product within our industry, especially in the high rise and railing sectors.

Our tempering facility includes an automatic arising and wash machine allowing all production to remain in-house, increasing productivity and efficiency. Continuing our tradition of dedicated customer care, we are proud to offer complete insulated glass units, laminated makeups and single glass panels in a range of tints and high performance options, as per individual specifications. We guarantee the quality of all our glass panels, which are certified in compliance with the SGCC North American regulations.

## FEATURES

- Compatible with digital ceramic printing for uniquely custom projects.
- Able to be Heat Soaked to prevent glass panels spontaneous breakages.
- High Performance options available for improved UV and solar protection.
- Safety glass manufactured to reach Canadian CAN/CGSB 12.1 standards

## THICKNESS

4mm - 8mm  
\*Custom thickness' available on request

## MAXIMUM SIZE

1800x3500mm, 71"x138"

## GLASS TYPES

Clear, Low Iron, Grey, Bronze, Low-E, Acid Etch, Pin Head  
\*Custom glass types and tints available on request

## Heat Soaking

To keep up with current E.U. glass safety standards Integral Seal is also able to offer Heat soaking. The process is designed to expose potential critical NiS (Nickel Sulfide) inclusions in fully tempered panels reducing the risk of spontaneous glass breakage. Heat soaking provides an additional defined level of confidence with your glass project, reducing the chance of unwanted hassle later.

## Glass Comparison



**Broken Tempered**

Small pieces fall away preventing serious injury.



**Broken Annealed**

Large sharp dangerous pieces brake off.





# LAMINATED GLASS

Offering a host of advantages Integral Seal's Laminated Glass is the ideal option when designing for any architectural application.

Laminated panels are a form of safety glass that are manufacture to hold together and remain secure when shattered. In the event of breakage, they are held in place by a specialized interlayer called EVA (ethylene-vinyl acetate). This interlayer holds firm upon impact remain bonded under high strength and preventing unsafe large sharp pieces from falling away. The result is a "spider web" cracking effect when impacted, which unlike single panels, is not enough to completely pierce the glass.

Not only are laminated panels safe but they are also secure and can be used as theft protected, especially if panels have also be tempered. These custom tempered make-ups become exceptionally tough removing the need for wire mesh or steel bars. Another benefit to laminated panels is increasing the sound insulation rating of a glass window. Testing found significant improvements in sound attenuation compared to single monolithic glass panes of the same thickness. We guarantee the quality of all our glass panels, which are certified in compliance with the SGCC North American regulations.

## FEATURES

Compatible with digital printing and Coloured Interlayers for uniquely custom projects.

Glass can be tempered for additional safety and security options.

High Performance options available for improved UV and solar protection.

Improved sound insulation properties reducing outside noise transmission.

## THICKNESS

6.76mm - 17.52mm

\*Custom thickness', make-ups & sizes available

## MAXIMUM SIZE

1800x3500mm

## GLASS TYPES

Clear, Low Iron, Grey, Bronze, Low-E

\*Custom types' available on request

## Glass Comparison



### Broken Laminated

Broken pieces remain held in-place by laminate.



### Broken Annealed

Large sharp dangerous pieces brake off.

## Software & Equipment

Integral Seal's lamination line allows panels to be cut much faster and more efficient than by hand removing excess waste thanks to the computerized optimization software. The process is carried out by our specialised production equipment which scores, cuts, heats and trims the interlayer all at the push of a button, removing human error and giving a far more precise finished product.



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# GLASS RAILING

Glass Railings are becoming an industry standard and are ideal for providing safety with minimal obstruction of views.

Integral Seal's Glass Railing systems feature sleek profiles that have been designed not only to look good but for safety and support. Produced to suite individual styles and compliment any project glass railings allow maximum visibility with minimum viewing disruption whilst reaching building safety standards.

Glass railings offer incredible versatility, with a wide range of fixing methods and handrail systems to perfectly match any positioning or style requirement. For challenging installations, the glass can be custom-cut and shaped. You can further customize your railing by choosing tinted glass for a different style or enhanced performance. To truly personalize the look, consider adding a unique design through Digital Glass Printing or Laser Etching.

## FEATURES

Printing or Laser Etching available for industry required high rise bird friendly dot pattern.

Glass is custom cut to suit and fits a wide range of hand rails currently used.

High Performance options available for improved UV and solar protection.

Compatible with digital ceramic printing for uniquely custom projects.

## THICKNESS

Single: 4mm - 8mm  
Lami: 6.76 - 17.52mm

## MAXIMUM SIZE

1800x3500mm,  
71"x138"

## GLASS TYPES

Clear, Low Iron, Grey, Bronze, Acid Etch, Pin Head  
\*Custom glass types and tints available on request

## Environmental

The past decade has seen a swell of interest in environmental issues from government, industry and citizens. One such issue is the protection of birds from fatal collisions with glass panels in buildings.

Utilizing digital printing or laser etching we are capable of incorporating the Toronto Green Standards (TGS) Tier 1 bird safety pattern without the hassle of stickers and films.

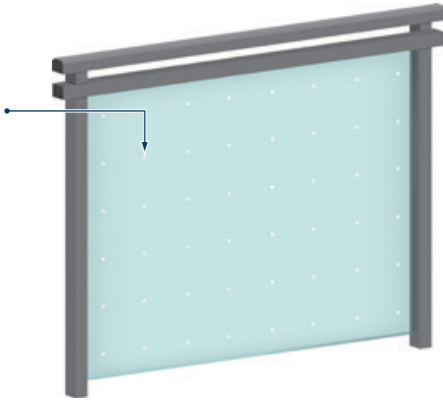
The terms state that across the initial 12m (30ft) of exterior glass a diversionary pattern not larger than 100mm spaced must be visible. This designated height is has been set to represent the height of the mature tree canopy.

## Railing Example

### Bird Friendly Print

Digital Printing  
Laser Etching

Dots 5mm / ¼"  
Space 100mm / 4"





# LASER ETCHING

Integral Seal’s specialized Laser Etching technology offers an ideal method for adding a personalized appearance and finish to your next glass project.

At Integral Seal we continue to make advancements in glass production technologies, as clearly demonstrated in our state of the art Laser Etching equipment. This cutting edge technology provides you the ability to etch custom imagery and patterns onto glass. The process is a quick, simple and cost effective solution to other products such as vinyl stickers. Whether it be an annealed clear panel that has a Low-E soft coat or a tinted grey panel that is tempered, Integral Seals Laser Etching can be applied to any glass type or makeup that we provide.

The Etching process is achieved with a CO<sup>2</sup> Laser beam removing a small amount of material and melting the glass surface. A big advantage of using a Laser on glass surfaces is that it is far less subject to dirt built-up and fingerprints than those of traditional sandblasting or rough Etching. Durability along with sustainability are further pros to Laser Etching due to the lack of need for paints or vinyl stickers, which may fade or peel off over time.

## FEATURES

Flexible application means Annealed, Tempered and Heat Strengthen options Available.

Etching can be placed on building exterior of Insulated Units for compliance with Toronto Green Standards.

Laser capable of various intensity settings to allow for image recreation on glass.

Durable against weather, scratches and UV fading, while remaining eco-friendly and sustainable.

## THICKNESS

Single: 4mm - 8mm  
Lami: 8.76 - 17.52mm

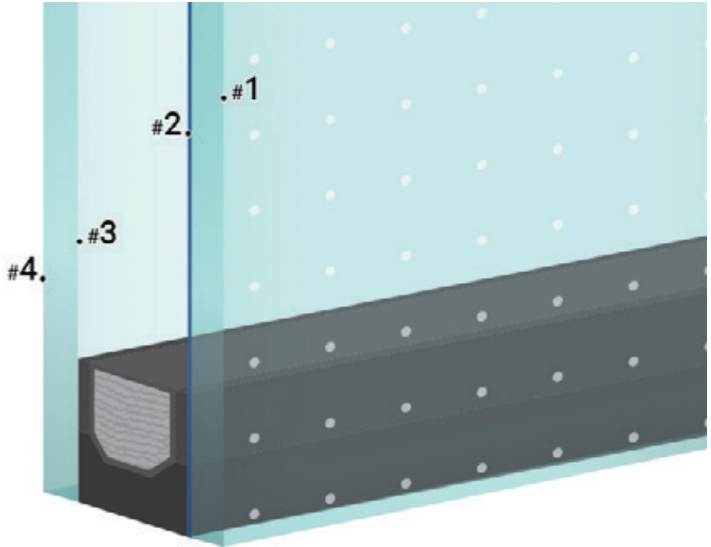
## MAXIMUM SIZE

1720x3400mm  
67 ½"x133 ½"

## GLASS TYPES

Clear, Low Iron, Grey, Bronze, Low-E  
\*Custom glass types and tints available on request

## Insulated Glass Unit Example



1. Surface #1 Building Exterior, Laser Etching
2. Surface #2 Inside Unit, Low-E Coating
3. Surface #3 Inside Unit
4. Surface #4 Building Interior

## Bird Friendly Glass

One more additional benefit is the ability to put Laser Etching onto the face of any glass surface. It is now possible to apply an Etch to the exterior Surface #1 of insulated units containing Low-E on the interior Surface #2. This is in accordance with the Toronto Green Standards (TGS) Tier 1 terms. These terms state that visual markers must be;

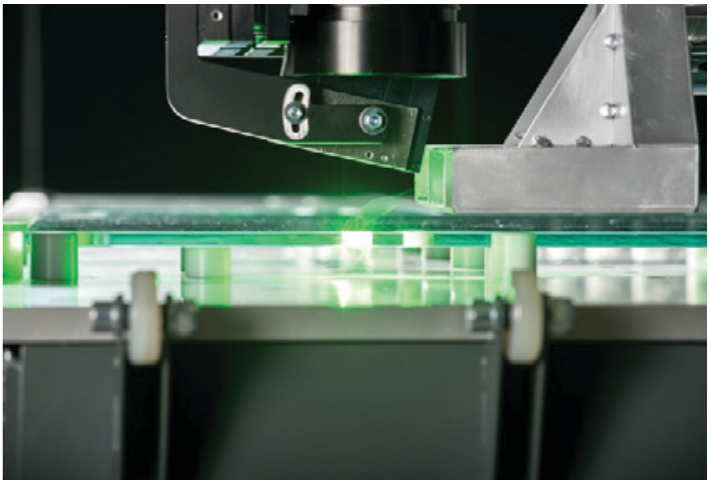
1. High in contrast to glass.
2. On the exterior face (surface #1) of glass.
3. On the first 12m (30ft) of glass from ground.



## Custom Imagery

Create a truly one of a kind project by Laser Etching a custom picture or pattern onto the glass. The state of the art Laser is capable of recreating high definition imagery with its options for various levels of transparency and weight.

Stuck for ideas have a look through our graphic range where we provide a wide variety of ready to go fully scalable patterns to suite any project. The range has been designed to be scaled and configured according to each application without issue, offering seemingly endless creative opportunities.





# DIGITAL PRINTING

Integral Seal's Digital Ceramic Printing is the perfect solution for vibrant yet durable printing directly to the surface of the glass.

Integral Seal's large format, digital glass printing process is capable of reproducing full colour photography, vector graphics and textures directly onto the surface. Using specialized ceramic inks that are free from lead and cadmium, our digital printing offers pinpoint accuracy and exceptional durability, making it ideal for both internal and external projects.

The printing process entails direct application of ceramic inks to the surface of a panel, with a purpose built glass printer. Panels are then tempered through a furnace where the inks are permanently fused to the glass becoming UV and Scratch resistant. This process is a time and cost efficient solution for incorporating art with architecture, opening up a wide array of creative options.

The versatility of Digital Printing stems from the durability and flexibility of the inks. They have the capacity to face internally, externally, inside a Double Glazed Unit or even within two laminated glass panels. The inks can also be printed on high performance glass and be teamed with coloured interlayers to give a truly custom option. Performance data for individual designs is available to assist in the development stages.

## FEATURES

Once tempered printed ceramic inks are UV, solvent and scratch resistant.

Ink coverage control allows for the fine tuning of light transmission on individual areas.

A 10 year warranty is provided against and colour fading and discolouration.

Detailed performance data available for all types of printed glass panels.

## THICKNESS

Single: 4mm - 8mm

Lami: 8.76 - 17.52mm

\*Custom thickness' available on request

## MAXIMUM SIZE

1800x3500mm,

71"x138"

## GLASS TYPES

Clear, Low Iron, Grey, Bronze, Low-E

\*Custom glass types and tints available on request



## Print Surface



### Internal Surface

Reflective Appearance  
Externally



### External Surface

Matt Appearance  
Externally



### Inside Laminate

Reflective Appearance  
Internal & External



### Inside IGU

Reflective Appearance  
Internal & External

## Colours Gamut & Etch Style Ink

The ceramic colour gamut allows for a wide variety of colour matching options and photo recreation opportunities. Rich deep blacks and bright whites are a particular strength, enhancing privacy while maintaining aesthetics.

In addition to our regular colours we also provide an etch style alternative. The benefit of this Etch Style Ink is its ability for transparency. This makes it ideal for units, railings, and other applications where a more subtle appearance is desired.



Blue



Red



Orange



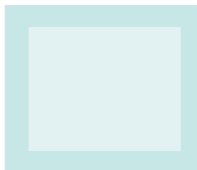
Green



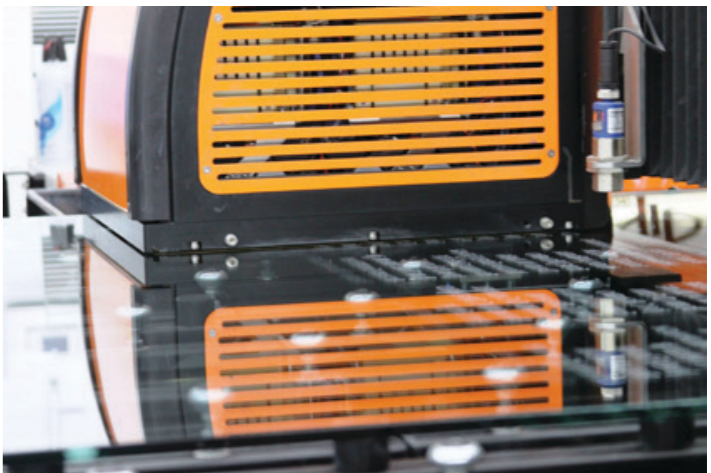
Black



White



Etch





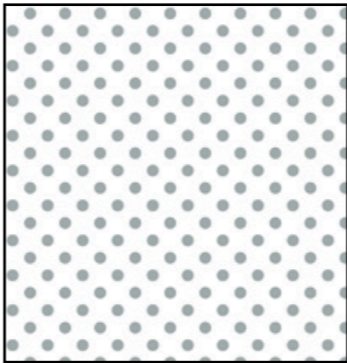
# GRAPHIC RANGE

Add some creative flair to your project without the hassle by choosing one of Integral Seal's purpose designed Graphic Range.

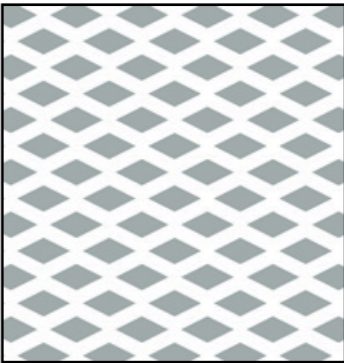
Incorporating creativity into a glass project is made easy with Integral Seal's Graphic Range. Developed a purpose built for Digital Printing the collection of patterns and textures is ensured to impress. The comprehensive Graphic range provides shading, diffuses light and decreases glare adding a performance component to an otherwise purely decorative product.

A workflow that is created entirely digitally allows for flexibility when designing unlike tradition screen printing methods. The range has been designed to be scaled, coloured and configured according to each application without issue offering seemingly endless creative opportunities. Ideal applications range from external canopies, facades and railings to internal office partitions, backslash's and shower screens.

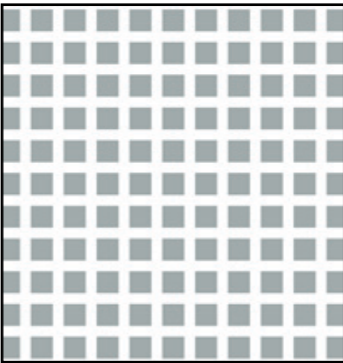
## Patterns



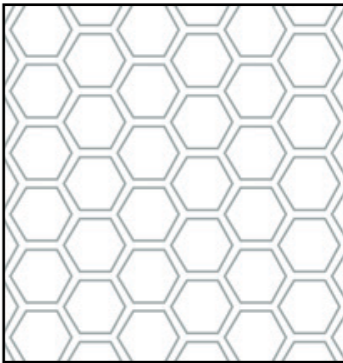
Dots



Diamond



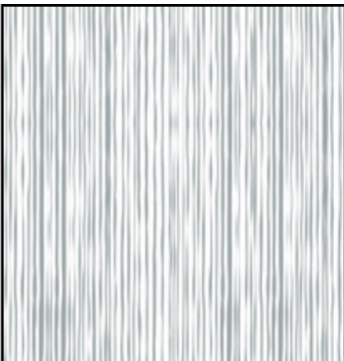
Square



Beehive



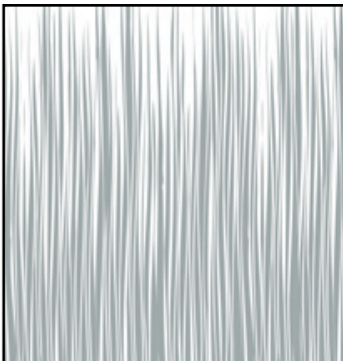
Barcode



Double Back



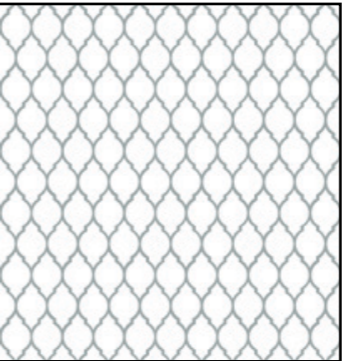
Peleton



Organic



Roman Times



Victorian



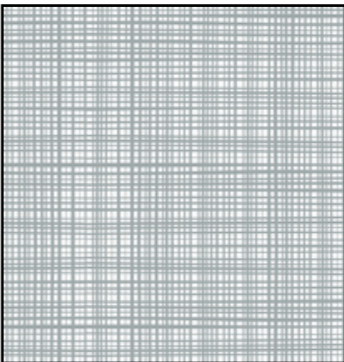
Interlaced



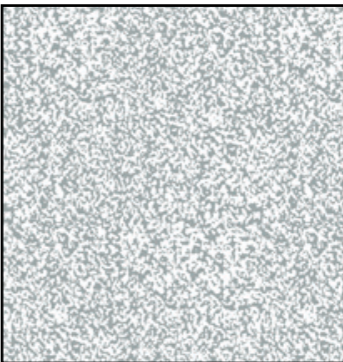
Crystal Maze



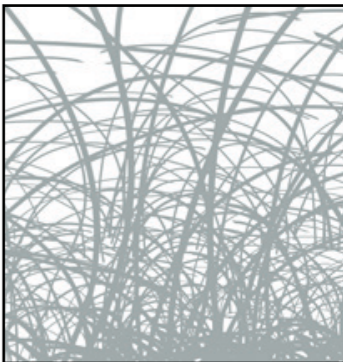
Fern Tales



Hessian



Rhubarb



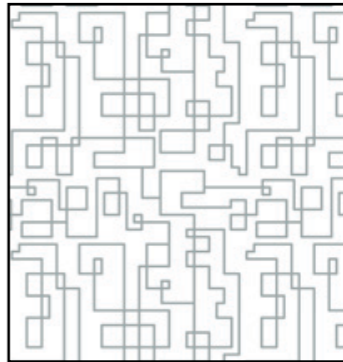
Grasslands



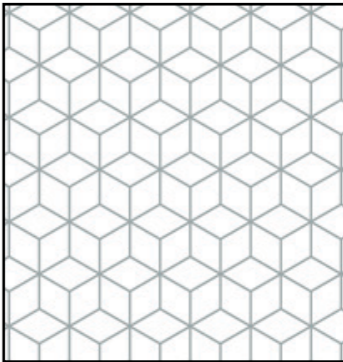
Weaving



Locked In



Screensaver



Boxed Levels

Textures



Light Stone 1



Light Stone 2



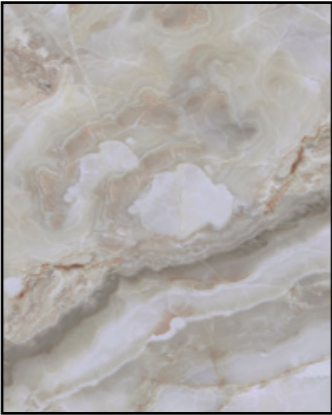
Light Stone 3



Light Stone 4



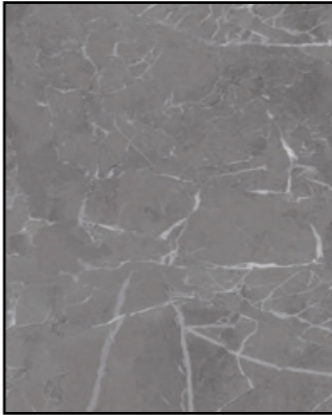
Mid Stone 1



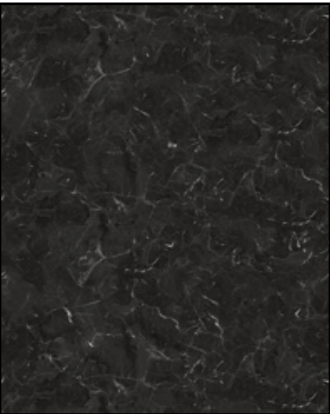
Mid Stone 2



Mid Stone 3



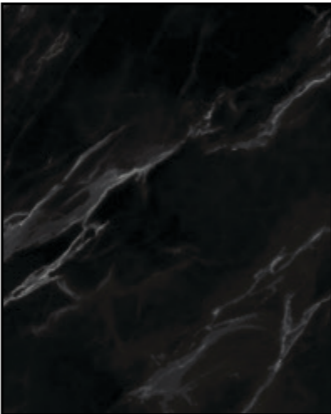
Mid Stone 4



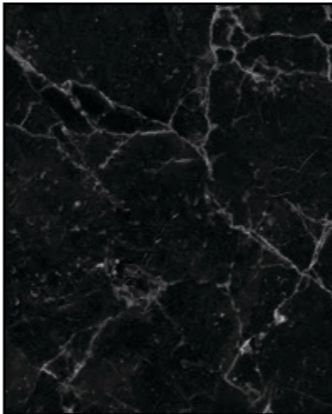
Dark Stone 1



Dark Stone 2



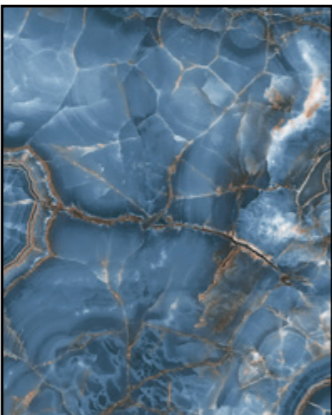
Dark Stone 3



Dark Stone 4



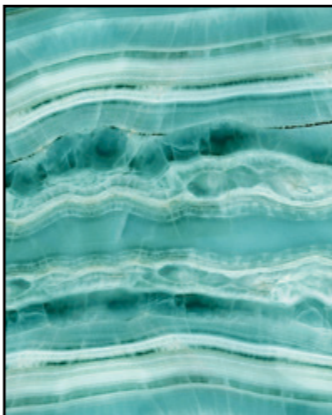
Red Stone



Blue Stone



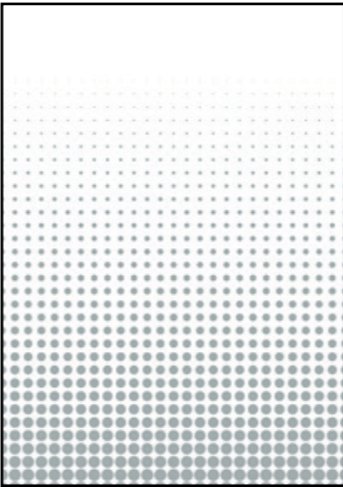
Yellow Stone



Turquoise Stone



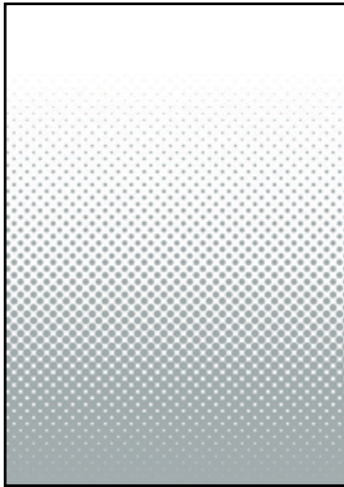
Gradients



Dotted



Lined



Offset Dotted



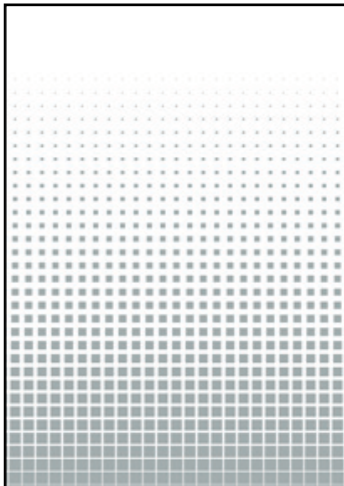
Boxed



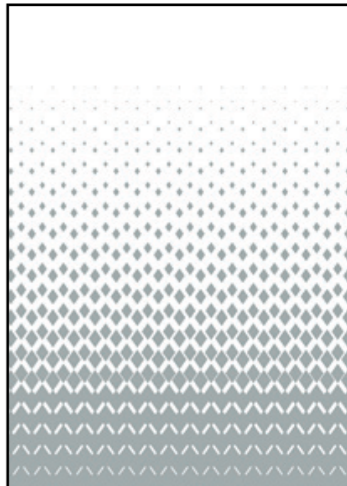
Tilting



Angular



Square



Diamond



#### FEATURES

Digitally printed ceramic inks are UV, solvent and scratch resistant.

Print from any high resolution digital image formats that you provide.

A 10 year warranty is provided against fading and discolouration.

No grout-lines makes glass much easier to wipe off and clean up mess.

#### THICKNESS

4mm - 8mm

\*Custom thickness' available on request

#### MAXIMUM SIZE

1800x3500mm

#### GLASS TYPES

Clear, Low Iron, Grey, Bronze

\*Custom types' available on request



### Selecting Images

While we offer the production and printing services, we ask that clients provide the image or design for their project. The most popular option is to purchase images or designs online from image libraries or professional photographers. Other clients have engaged graphic designers and interior decorators to create custom designs with stunning results.

If you are not sure where to start have a read through some of Integral Seal's website guides to help you with selecting images, resolutions and other information about the process. If finding the correct image is too difficult have a look through the in house graphic range of textures and patterns available for free use.

# PRINTED BACKSPLASH

The custom feature to any new design or remodel Integral Seal's Printed Glass Backsplash's are both a vibrant and durable.

Produced with Integral Seal's digital printing process, glass backsplash's use permanent ceramic inks fused directly into the glass. Due to there durability and easy to clean nature glass backsplash's are an ideal substitute for tiles and other materials. Photographs, illustrations, paintings and even marble textures are available with printed glass backsplash's making it the custom feature of any project.

Printed glass backsplash's can be installed in place of a regular kitchen backsplash or outdoors in alfresco areas. They are ideal for wet areas such as bathrooms and showers, or in lift wells to create eye popping features. Irregular shapes to fit range hoods or around corners are no problem, Integral Seal's production facility is more than capable too deal with any application.





#### FEATURES

Improves laminated glass panels acoustic and thermal performance capabilities.

Combine Coloured Interlayers with digital ceramic printing for uniquely custom projects.

Additional Transparent, Frosted & Opaque colour options and styles available.

Glass can be tempered / heat soaked for additional safety and security options.

#### THICKNESS

8.76mm - 17.52mm

\*Custom thickness' and makeups available

#### MAXIMUM SIZE

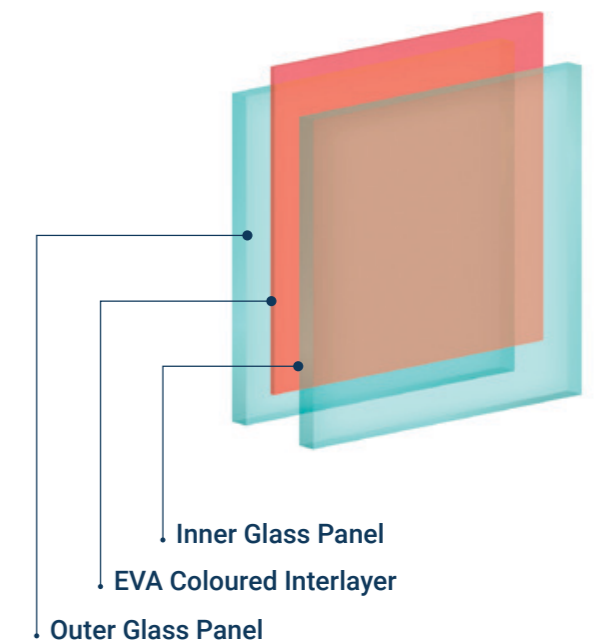
1800x3500mm, 71"x138"

#### GLASS TYPES

Clear, Low Iron, Acid Etch

\*Custom glass types and tints available on request

#### Glass Make-up



#### Custom Options

Transparent, Translucent and Opaque options are available allowing you to achieve the perfect vibrancy and intensity when glazing. Further more colours can be layered together creating almost endless options. For a truly custom look and style combine Coloured Interlayers with a design utilizing digital printing or Laser Etching.

# COLOURED INTERLAYERS

Create a truly unique project by incorporate some colour, using Integral Seal's eye catching Coloured Interlayer range.

Designed form maximum clarity along with stability over a long period of time Coloured Interlayers offer a simple yet stunning option to any internal glass project. Permanently laminated between two panels of glass, the wide array of colours range from subtle blues and greens to vibrant bright reds and purples.

Because the film is laminated between panels the adhesion lasts far longer than regular stick on films, removing the chance of those unseemly peeling edges. Coloured Interlayers are manufactured from sustainable materials and maintain their impact resistance. They reach the all typical safety standards of Integral Seal's regular EVA laminated glass panels.





# PERFORMANCE DATA

See tables for Clear and Tinted Glass performance data in single, laminated and insulated make-ups.

## Single Glaze

Glass	Thickness	Visible Light			SHGC	Winter U-Value	Summer U-Value
		Trans	Refl. Out	Refl. In			
Clear	4	89	8	8	0.85	5.90	5.32
Clear	5	89	8	8	0.86	5.87	5.30
Clear	6	88	8	8	0.82	5.84	5.27
Clear	8	86	8	8	0.78	5.81	5.24
Grey	6	45	5	5	0.60	5.84	5.27
Grey	8	34	5	5	0.53	5.76	5.21
Bronze	6	54	5	5	0.63	5.84	5.27
Bronze	8	44	5	5	0.56	5.76	5.21

## Laminated Glass

Glass	Thickness	Visible Light			SHGC	Winter U-Value	Summer U-Value
		Trans	Refl. Out	Refl. In			
Clear   Clear	6.76	88	7	7	0.79	5.79	5.23
Clear   Clear	8.76	88	7	7	0.78	5.73	5.18
Clear   Clear	10.76	87	7	7	0.76	5.68	5.14
Clear   Clear	12.76	84	7	7	0.73	5.62	5.09
Clear   Clear	16.76	84	7	7	0.69	5.58	5.04
Grey   Clear	12.76	43	5	5	0.54	5.62	5.09
Grey   Clear	16.76	33	5	5	0.49	5.55	5.03
Bronze   Clear	12.76	51	5	5	0.57	5.62	5.09
Bronze   Clear	16.76	42	5	5	0.51	5.55	5.03

## Insulated Glass Units

Glass	Thickness	Visible Light			SHGC	Winter U-Value	Summer U-Value
		Trans	Refl. Out	Refl. In			
Clear   Clear	4 + 12.7 + 4	81	14	14	0.77	2.59	2.75
Clear   Clear	5 + 12.7 + 5	80	14	14	0.76	2.57	2.73
Clear   Clear	6 + 12.7 + 6	78	14	14	0.73	2.56	2.72
Grey   Clear	4 + 12.7 + 4	50	8	8	0.55	2.59	2.75
Grey   Clear	6 + 12.7 + 6	40	7	12	0.47	2.56	2.72
Bronze   Clear	4 + 12.7 + 4	57	9	13	0.59	2.59	2.75
Bronze   Clear	6 + 12.7 + 6	48	8	12	0.48	2.56	2.72

**\*\*If you require more information such as Low-E performance options\*\***  
**Please visit our website or feel free contact us and ask to speak to a sales representative.**