

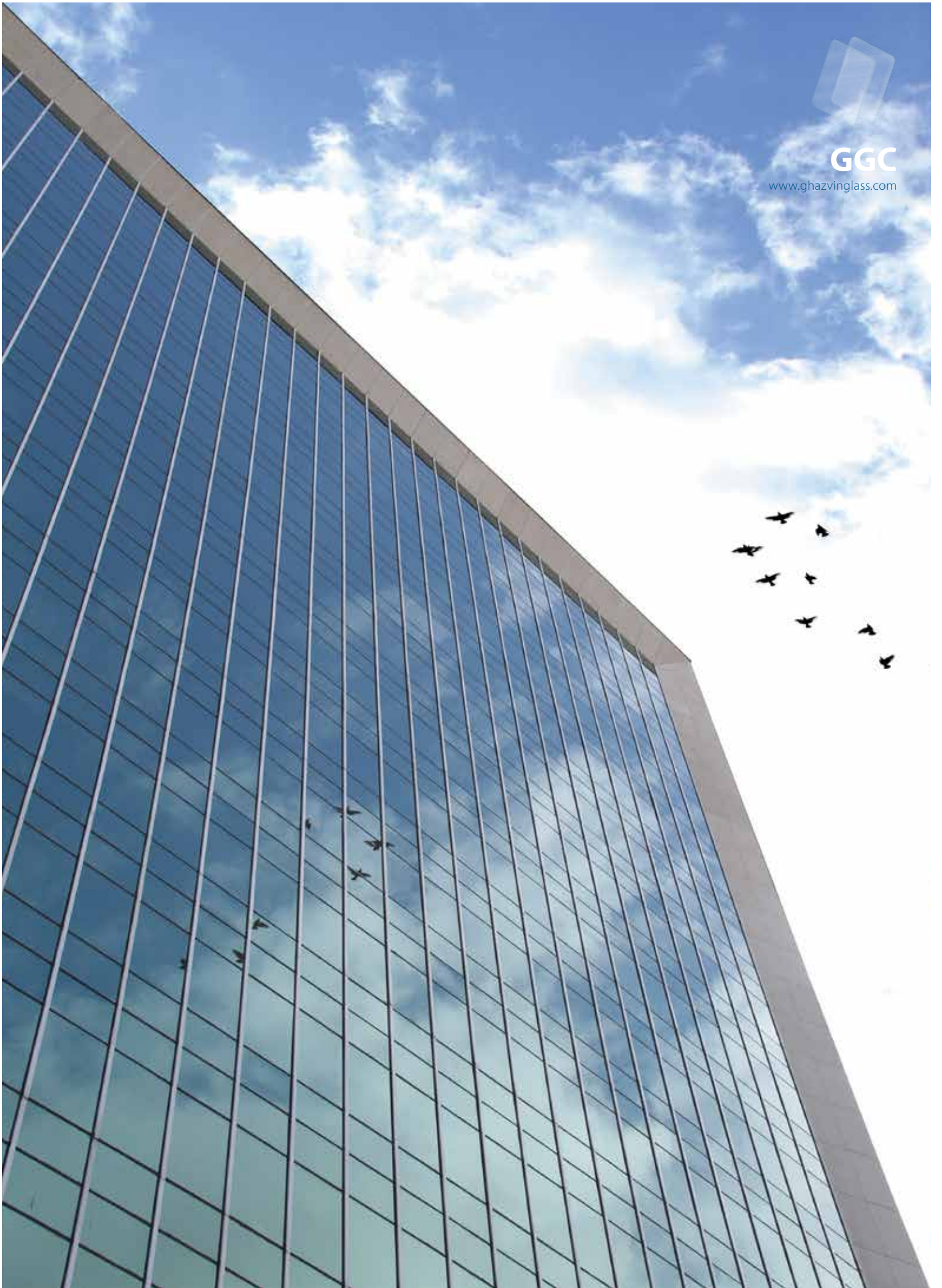


Ghazvin Glass Co.



GGC

www.ghazvinglass.com





As time goes by, the importance of glass and its role in our lives is growing. New insights into the future use of glass in construction, in furniture and white goods, industry and decoration are seen every day.

The increasing glass usage is due to the specific properties of this versatile product. Here are the main ones:

- Its transparency, which allows light to pass through and makes glass a particularly useful material for many applications.
- Its relatively high chemical resistance against water and other atmospheric elements, which allows its use as an everyday product.
- Its non-absorbance of pollutants, which makes it an easily washable material.
- Its stiffness and scratch-resistance, which make it suitable as a structural material.

Glass can be turned into many processed glass products such as toughened glass, laminated glass and decorative glass. Brief descriptions of each of these processed glass types are available in this catalogue.

Ghazvin Glass Company



4 - 5

Estekhrat Co.
(Glass Raw Material Exploration Company)
Ghazvin Glass Crushing Plant



6 - 9

Farsjin Flat Plant
Automotive Float Glass
Architectural Float Glass
Back Painted Float Glass
Silkscreened Float Glass



10 - 23

Patterned Glass



24 - 27

Secondary Processed Glass
Toughened Glass Production Line
Insulating Glass Production Line
Laminated Glass
Decorative Laminated Unit
Primary Processing Unit



28 - 53

Packing and Dispatching of Sheet Glass



54 - 55

Consulting and Design Services



60 - 61

R&D



58 - 59

Quality Control and Laboratory



56 - 57

Technical specifications

| توضیحات | واحد | مقدار |
|------------|------|--|
| ضخامت شیشه | mm | 3, 4, 5, 6, 8, 10, 12, 15, 19, 25, 32, 38, 45, 51, 59, 64, 79, 99, 119, 152, 190, 228, 254, 305, 381, 457, 508, 635, 762, 914, 1143, 1219, 1524, 1905, 2286, 2540, 3048, 3810, 4570, 5080, 6350, 7620, 9140, 11430, 12190, 15240, 19050, 22860, 25400, 30480, 38100, 45700, 50800, 63500, 76200, 91400, 114300, 121900, 152400, 190500, 228600, 254000, 304800, 381000, 457000, 508000, 635000, 762000, 914000, 1143000, 1219000, 1524000, 1905000, 2286000, 2540000, 3048000, 3810000, 4570000, 5080000, 6350000, 7620000, 9140000, 11430000, 12190000, 15240000, 19050000, 22860000, 25400000, 30480000, 38100000, 45700000, 50800000, 63500000, 76200000, 91400000, 114300000, 121900000, 152400000, 190500000, 228600000, 254000000, 304800000, 381000000, 457000000, 508000000, 635000000, 762000000, 914000000, 1143000000, 1219000000, 1524000000, 1905000000, 2286000000, 2540000000, 3048000000, 3810000000, 4570000000, 5080000000, 6350000000, 7620000000, 9140000000, 11430000000, 12190000000, 15240000000, 19050000000, 22860000000, 25400000000, 30480000000, 38100000000, 45700000000, 50800000000, 63500000000, 76200000000, 91400000000, 114300000000, 121900000000, 152400000000, 190500000000, 228600000000, 254000000000, 304800000000, 381000000000, 457000000000, 508000000000, 635000000000, 762000000000, 914000000000, 1143000000000, 1219000000000, 1524000000000, 1905000000000, 2286000000000, 2540000000000, 3048000000000, 3810000000000, 4570000000000, 5080000000000, 6350000000000, 7620000000000, 9140000000000, 11430000000000, 12190000000000, 15240000000000, 19050000000000, 22860000000000, 25400000000000, 30480000000000, 38100000000000, 45700000000000, 50800000000000, 63500000000000, 76200000000000, 91400000000000, 114300000000000, 121900000000000, 152400000000000, 190500000000000, 228600000000000, 254000000000000, 304800000000000, 381000000000000, 457000000000000, 508000000000000, 635000000000000, 762000000000000, 914000000000000, 1143000000000000, 1219000000000000, 1524000000000000, 1905000000000000, 2286000000000000, 2540000000000000, 3048000000000000, 3810000000000000, 4570000000000000, 5080000000000000, 6350000000000000, 7620000000000000, 9140000000000000, 11430000000000000, 12190000000000000, 15240000000000000, 19050000000000000, 22860000000000000, 25400000000000000, 30480000000000000, 38100000000000000, 45700000000000000, 50800000000000000, 63500000000000000, 76200000000000000, 91400000000000000, 114300000000000000, 121900000000000000, 152400000000000000, 190500000000000000, 228600000000000000, 254000000000000000, 304800000000000000, 381000000000000000, 457000000000000000, 508000000000000000, 635000000000000000, 762000000000000000, 914000000000000000, 1143000000000000000, 1219000000000000000, 1524000000000000000, 1905000000000000000, 2286000000000000000, 2540000000000000000, 3048000000000000000, 3810000000000000000, 4570000000000000000, 5080000000000000000, 6350000000000000000, 7620000000000000000, 9140000000000000000, 11430000000000000000, 12190000000000000000, 15240000000000000000, 19050000000000000000, 22860000000000000000, 25400000000000000000, 30480000000000000000, 38100000000000000000, 45700000000000000000, 50800000000000000000, 63500000000000000000, 76200000000000000000, 91400000000000000000, 114300000000000000000, 121900000000000000000, 152400000000000000000, 190500000000000000000, 228600000000000000000, 254000000000000000000, 304800000000000000000, 381000000000000000000, 457000000000000000000, 508000000000000000000, 635000000000000000000, 762000000000000000000, 914000000000000000000, 1143000000000000000000, 1219000000000000000000, 1524000000000000000000, 1905000000000000000000, 2286000000000000000000, 2540000000000000000000, 3048000000000000000000, 3810000000000000000000, 4570000000000000000000, 5080000000000000000000, 6350000000000000000000, 7620000000000000000000, 9140000000000000000000, 11430000000000000000000, 12190000000000000000000, 15240000000000000000000, 19050000000000000000000, 22860000000000000000000, 25400000000000000000000, 30480000000000000000000, 38100000000000000000000, 45700000000000000000000, 50800000000000000000000, 63500000000000000000000, 76200000000000000000000, 91400000000000000000000, 114300000000000000000000, 121900000000000000000000, 152400000000000000000000, 190500000000000000000000, 228600000000000000000000, 254000000000000000000000, 304800000000000000000000, 381000000000000000000000, 457000000000000000000000, 508000000000000000000000, 635000000000000000000000, 762000000000000000000000, 914000000000000000000000, 1143000000000000000000000, 1219000000000000000000000, 1524000000000000000000000, 1905000000000000000000000, 2286000000000000000000000, 2540000000000000000000000, 3048000000000000000000000, 3810000000000000000000000, 4570000000000000000000000, 5080000000000000000000000, 6350000000000000000000000, 7620000000000000000000000, 9140000000000000000000000, 11430000000000000000000000, 12190000000000000000000000, 15240000000000000000000000, 19050000000000000000000000, 22860000000000000000000000, 25400000000000000000000000, 30480000000000000000000000, 38100000000000000000000000, 45700000000000000000000000, 50800000000000000000000000, 63500000000000000000000000, 76200000000000000000000000, 91400000000000000000000000, 114300000000000000000000000, 121900000000000000000000000, 152400000000000000000000000, 190500000000000000000000000, 228600000000000000000000000, 254000000000000000000000000, 304800000000000000000000000, 381000000000000000000000000, 457000000000000000000000000, 508000000000000000000000000, 635000000000000000000000000, 762000000000000000000000000, 914000000000000000000000000, 1143000000000000000000000000, 1219000000000000000000000000, 1524000000000000000000000000, 1905000000000000000000000000, 2286000000000000000000000000, 2540000000000000000000000000, 3048000000000000000000000000, 3810000000000000000000000000, 4570000000000000000000000000, 5080000000000000000000000000, 6350000000000000000000000000, 7620000000000000000000000000, 9140000000000000000000000000, 11430000000000000000000000000, 12190000000000000000000000000, 15240000000000000000000000000, 19050000000000000000000000000, 22860000000000000000000000000, 25400000000000000000000000000, 30480000000000000000000000000, 38100000000000000000000000000, 45700000000000000000000000000, 50800000000000000000000000000, 63500000000000000000000000000, 76200000000000000000000000000, 91400000000000000000000000000, 114300000000000000000000000000, 121900000000000000000000000000, 152400000000000000000000000000, 190500000000000000000000000000, 228600000000000000000000000000, 254000000000000000000000000000, 304800000000000000000000000000, 381000000000000000000000000000, 457000000000000000000000000000, 508000000000000000000000000000, 635000000000000000000000000000, 762000000000000000000000000000, 914000000000000000000000000000, 1143000000000000000000000000000, 1219000000000000000000000000000, 1524000000000000000000000000000, 1905000000000000000000000000000, 2286000000000000000000000000000, 2540000000000000000000000000000, 3048000000000000000000000000000, 3810000000000000000000000000000, 4570000000000000000000000000000, 5080000000000000000000000000000, 6350000000000000000000000000000, 7620000000000000000000000000000, 9140000000000000000000000000000, 11430000000000000000000000000000, 12190000000000000000000000000000, 15240000000000000000000000000000, 19050000000000000000000000000000, 22860000000000000000000000000000, 25400000000000000000000000000000, 30480000000000000000000000000000, 38100000000000000000000000000000, 45700000000000000000000000000000, 50800000000000000000000000000000, 63500000000000000000000000000000, 76200000000000000000000000000000, 91400000000000000000000000000000, 114300000000000000000000000000000, 121900000000000000000000000000000, 152400000000000000000000000000000, 190500000000000000000000000000000, 228600000000000000000000000000000, 254000000000000000000000000000000, 304800000000000000000000000000000, 381000000000000000000000000000000, 457000000000000000000000000000000, 508000000000000000000000000000000, 635000000000000000000000000000000, 762000000000000000000000000000000, 914000000000000000000000000000000, 1143000000000000000000000000000000, 1219000000000000000000000000000000, 1524000000000000000000000000000000, 1905000000000000000000000000000000, 2286000000000000000000000000000000, 2540000000000000000000000000000000, 3048000000000000000000000000000000, 3810000000000000000000000000000000, 4570000000000000000000000000000000, 5080000000000000000000000000000000, 6350000000000000000000000000000000, 7620000000000000000000000000000000, 9140000000000000000000000000000000, 11430000000000000000000000000000000, 12190000000000000000000000000000000, 15240000000000000000000000000000000, 19050000000000000000000000000000000, 22860000000000000000000000000000000, 25400000000000000000000000000000000, 30480000000000000000000000000000000, 38100000000000000000000000000000000, 45700000000000000000000000000000000, 50800000000000000000000000000000000, 63500000000000000000000000000000000, 76200000000000000000000000000000000, 91400000000000000000000000000000000, 114300000000000000000000000000000000, 121900000000000000000000000000000000, 152400000000000000000000000000000000, 190500000000000000000000000000000000, 228600000000000000000000000000000000, 254000000000000000000000000000000000, 304800000000000000000000000000000000, 381000000000000000000000000000000000, 457000000000000000000000000000000000, 508000000000000000000000000000000000, 635000000000000000000000000000000000, 762000000000000000000000000000000000, 914000000000000000000000000000000000, 1143000000000000000000000000000000000, 1219000000000000000000000000000000000, 1524000000000000000000000000000000000, 1905000000000000000000000000000000000, 2286000000000000000000000000000000000, 2540000000000000000000000000000000000, 3048000000000000000000000000000000000, 3810000000000000000000000000000000000, 4570000000000000000000000000000000000, 5080000000000000000000000000000000000, 6350000000000000000000000000000000000, 7620000000000000000000000000000000000, 9140000000000000000000000000000000000, 11430000000000000000000000000000000000, 12190000000000000000000000000000000000, 15240000000000000000000000000000000000, 19050000000000000000000000000000000000, 22860000000000000000000000000000000000, 25400000000000000000000000000000000000, 30480000000000000000000000000000000000, 38100000000000000000000000000000000000, 45700000000000000000000000000000000000, 50800000000000000000000000000000000000, 63500000000000000000000000000000000000, 76200000000000000000000000000000000000, 91400000000000000000000000000000000000, 114300000000000000000000000000000000000, 121900000000000000000000000000000000000, 152400000000000000000000000000000000000, 190500000000000000000000000000000000000, 228600000000000000000000000000000000000, 254000000000000000000000000000000000000, 304800000000000000000000000000000000000, 381000000000000000000000000000000000000, 4570000000000000 |

Ghazvin Glass Company

Ghazvin Glass Company (plc)

In response to the increasing rate of sheet glass consumption in Iran and after thorough studies conducted by the Bank of Industry and Mines, Ghazvin Glass Factory was established in 1965, with a capital cost of more than one billion Rials. The first plant was constructed on the 3rd KM of Qazvin-Rasht road, on a 260,000 m² plot of land, with a building area of 100,000 m² allocated to a production hall, warehouse, administrative office, engineering services and repair workshops.

At that time, the factory was the biggest sheet glass production facility in the country and enjoyed state-of-the-art glass production technology. GGC glass became the highest quality product of its kind in the Middle East. Later on, as the market demand for different types of sheet glass soared, the company decided to expand its product range by establishment of a patterned glass production line, followed by a new float glass production plant and a complex of downstream processing facilities. Through these investments GGC sought to increase its competitive strength in the international market alongside its continued dedication to local consumers. What made all this possible was the directors' commitment to the use of the newest manufacturing technologies, improving the company knowledge and relying on the perseverance of the company's skilled, young workforce. This company has continued to pursue its endeavours in a structured way, so that GGC's total production facilities now exceed 3,000,000 m² in area.





Estekhranj Co. (Glass Raw Material Exploitation Company)

The demand for quality silica sand (the main glassmaking raw material) by local glass production plants led to the establishment in 1993 of Estekhranj Company based on the newest raw material processing technologies of the time.

This company is capable of producing silica with a nominal capacity of 360,000 ton/year to be supplied to a number of sheet glass and crystalware manufacturers.





Ghazvin Glass Crushing Plant

In order to support the company's requirement for high quality raw materials, GGC's mineral resources are thoroughly investigated and the supplied raw materials such as silica sand, dolomite and limestone are delivered from various mineral mines to the company's own

crushing plant which was established in 1996.

Today Ghazvin Glass Crushing Plant produces some 100,000 ton/year of grain-sized silica to be used in the company's furnaces.

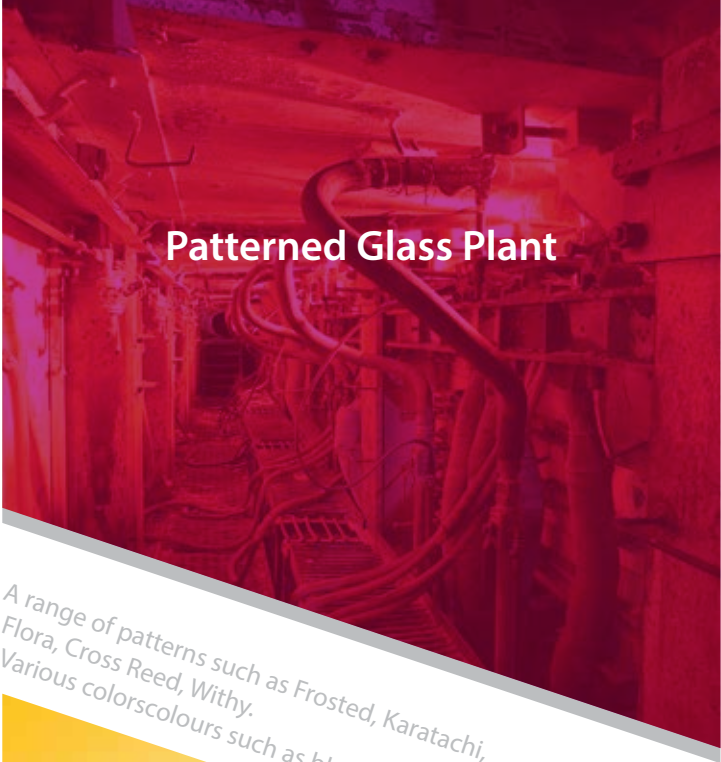








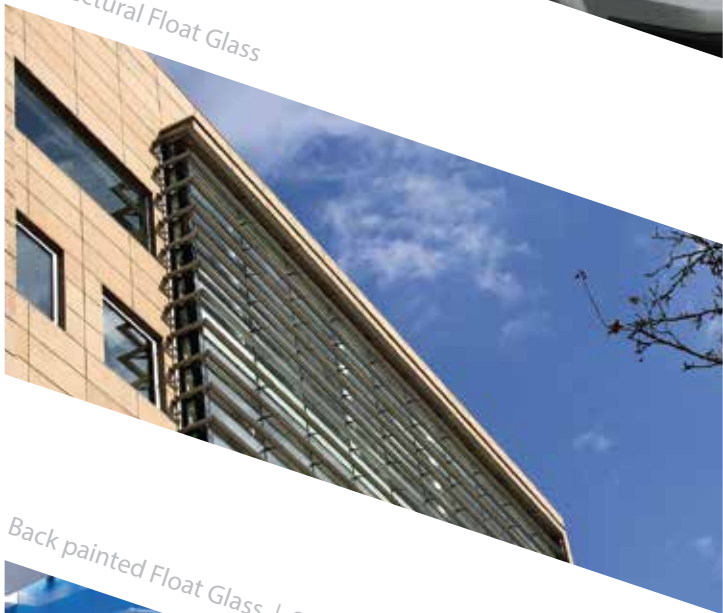
Farsejin Float Plant



Patterned Glass Plant



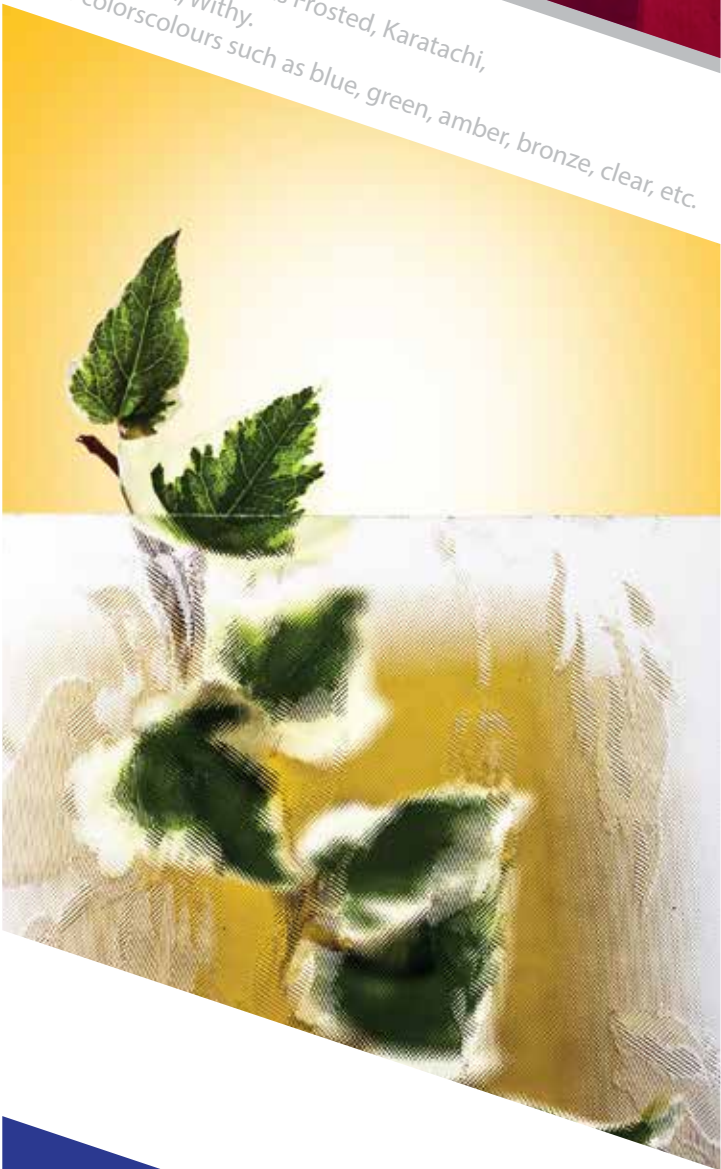
Automotive Float Glass



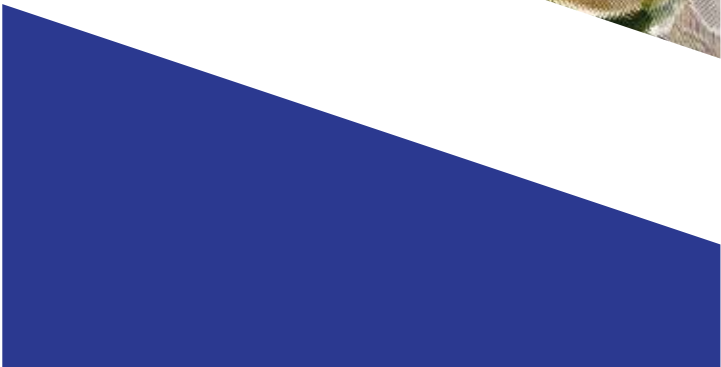
Architectural Float Glass



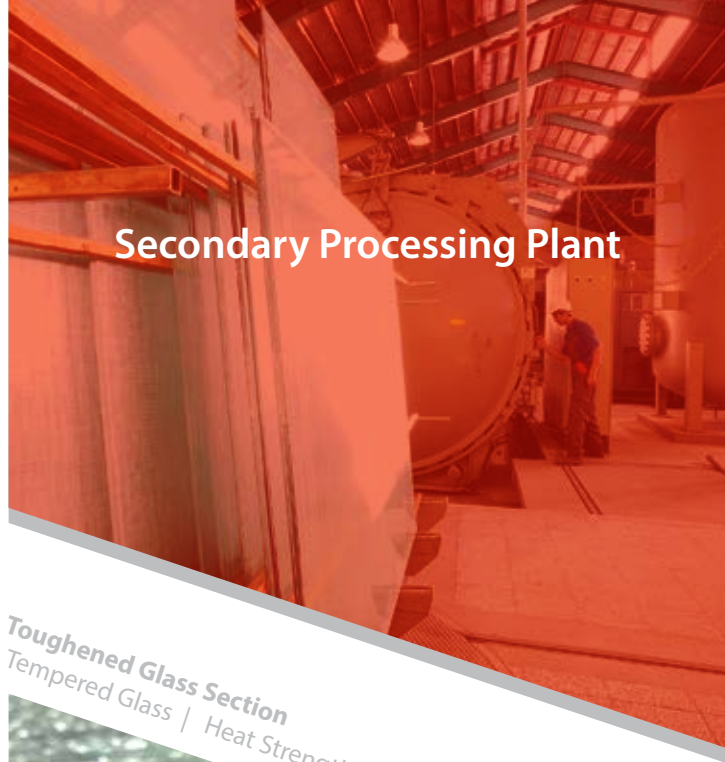
Back painted Float Glass | Silkscreened Float Glass



A range of patterns such as Frosted, Karatachi, Flora, Cross Reed, Withy.
Various colors such as blue, green, amber, bronze, clear, etc.

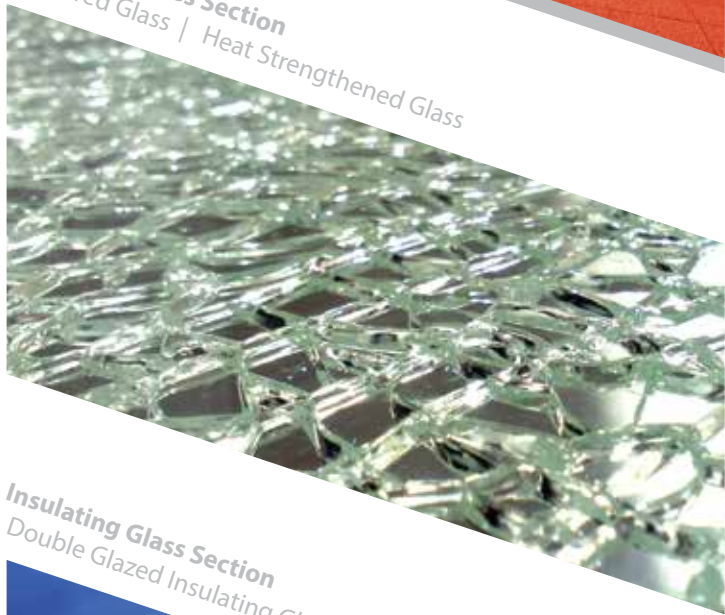


Secondary Processing Plant



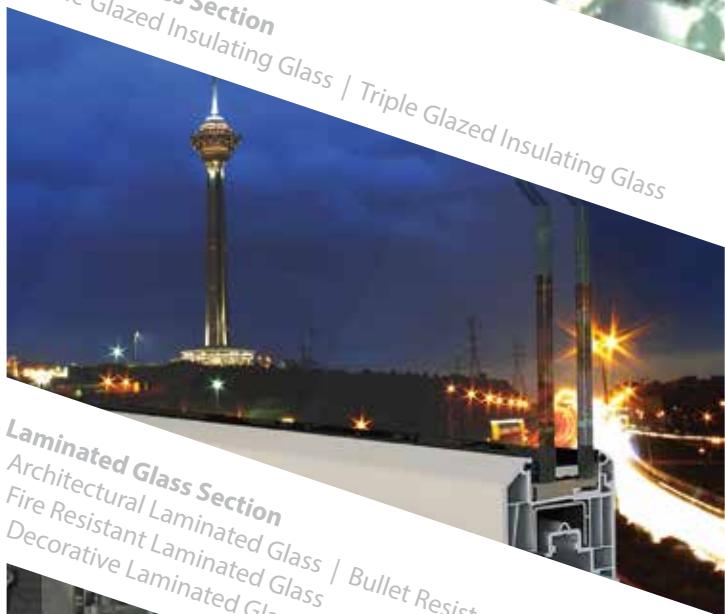
Toughened Glass Section

Tempered Glass | Heat Strengthened Glass



Insulating Glass Section

Double Glazed Insulating Glass | Triple Glazed Insulating Glass



Laminated Glass Section

Architectural Laminated Glass | Bullet Resistant Laminated Glass
Fire Resistant Laminated Glass
Decorative Laminated Glass (see also Decorative Glass Section)



Decorative Glass Section

Decorative Laminated Glass | Back Painted Glass
Silkscreened Glass | Printed Glass



Primary Processing Section

A full range of primary processing services such as drilling, cut outs, bevelling, polishing, CNC engraving, etc.





Farsejin Float Plant

In late 2001, GGC released the news of commencing its new project for construction of a float glass plant with the cooperation of Pilkington Company, UK. Comprehensive specification and design works were carried out, followed by the construction works on a 2,000,000 m² plot of land, 70 km from Ghazvin near Farsejin village, with a building area of 70,000 m². In 2009 Farsejin Float Plant was officially opened.

With the use of Pilkington technology, GGC Farsejin Float Plant is capable of manufacturing high quality float glass in a thickness range 1.8-12 mm in sizes up to max 6500×3600 mm with a total production capacity of 180,000 ton/year.

GGC and Pilkington companies have signed a contract for construction and commissioning of two float production lines, the second of which was put into construction right after the first one's inauguration.

The accurate thickness and flatness of float glass makes it the perfect material for a number of end-products such as automotive glass and mirrors and also an ideal commodity for other industrial uses.





Automotive Float Glass

GGC Float Glass's fine colour and the lack of defects such as distorting waves or thickness variability make it suitable for automotive glass production in thicknesses 2.2, 3.5 mm, etc. This is the first time an Iranian glass producer has managed to offer a specific-formula green glass appropriate for the automotive glass industry and equal to

current imported products in terms of quality standards. We are honoured to offer a product which meets the high quality requirements of all automotive glass end users, and we hope that, GGC will be the best Iranian automotive green glass producer for the foreseeable future.





Architectural Float Glass

Providing the visual contact between inhabitants of buildings and their environment, windows occupy a considerable portion of the external surfaces. GGC Architectural Float Glass has the necessary clearness, flatness and high quality to give the inhabitants a better view to the outside world and a visual sense of tranquility.

Table 1





Back Painted Float Glass

Form and function are complementary qualities. Through its industrial background and long-standing experience in the production of different types of glass, Ghazvin Glass Company has become the first Iranian glassmaker to produce back painted glass in standard sheet sizes. In this production process, one side of the glass is coated with a ceramic frit which is then fired to produce a glass that can be cut or processed through secondary processing procedures. This attribute will lead to a noticeable increase in this product's consumption,

in comparison to the previous generation of painted glass which was produced in specific sizes to customer orders in the form of coated safety glass. The coating enamel on this type of glass gives it proper resistance against acids, alkalis and scratches. The frit used is one the best quality coating materials available in the local market and is available in a wide range of attractive colours. The printing is accomplished with silk-screening procedures on standard sheet sizes of 3210×2250 mm, 2500×1605 mm, etc.





Silkscreened Float Glass

An advantage of coloured glass sheets is that they give people visual calmness and thus reduce environmental stress. Nowadays, in addition to traditional patterns, modern silkscreened glass is being produced in new designs (mono-color or multi-color) for various purposes. One novel approach is to print the customer's own design (created by architects, designers and artists)

on a glass sheet of a particular thickness and size, based on the customer's taste and the application. The product can be used for internal space partitioning, artificial walls and the like. The most outstanding features of GGC Silkscreened Float Glass are its capability to be cut and beveled and its tolerance of any kind of secondary processing procedure.





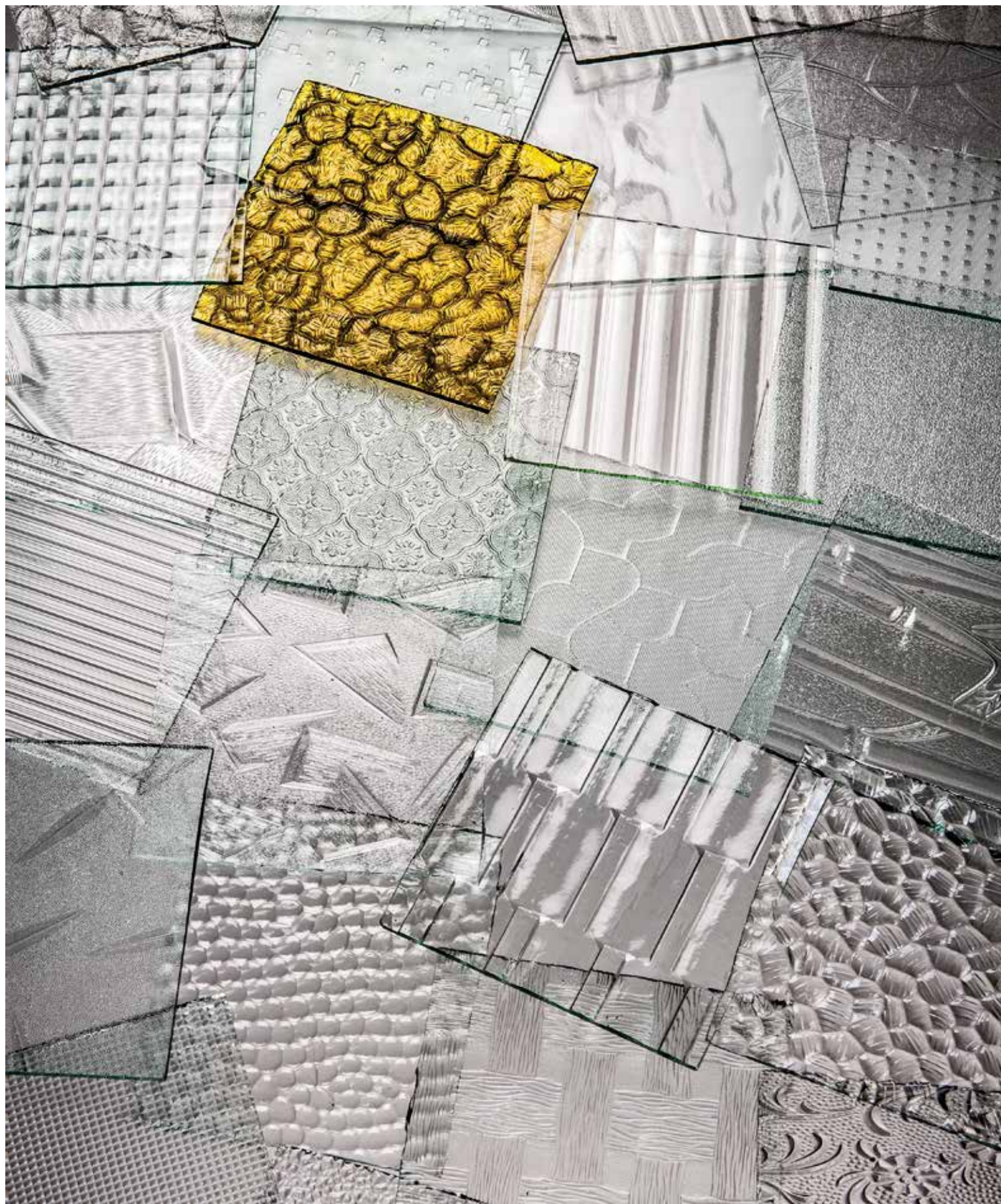
Patterned Glass

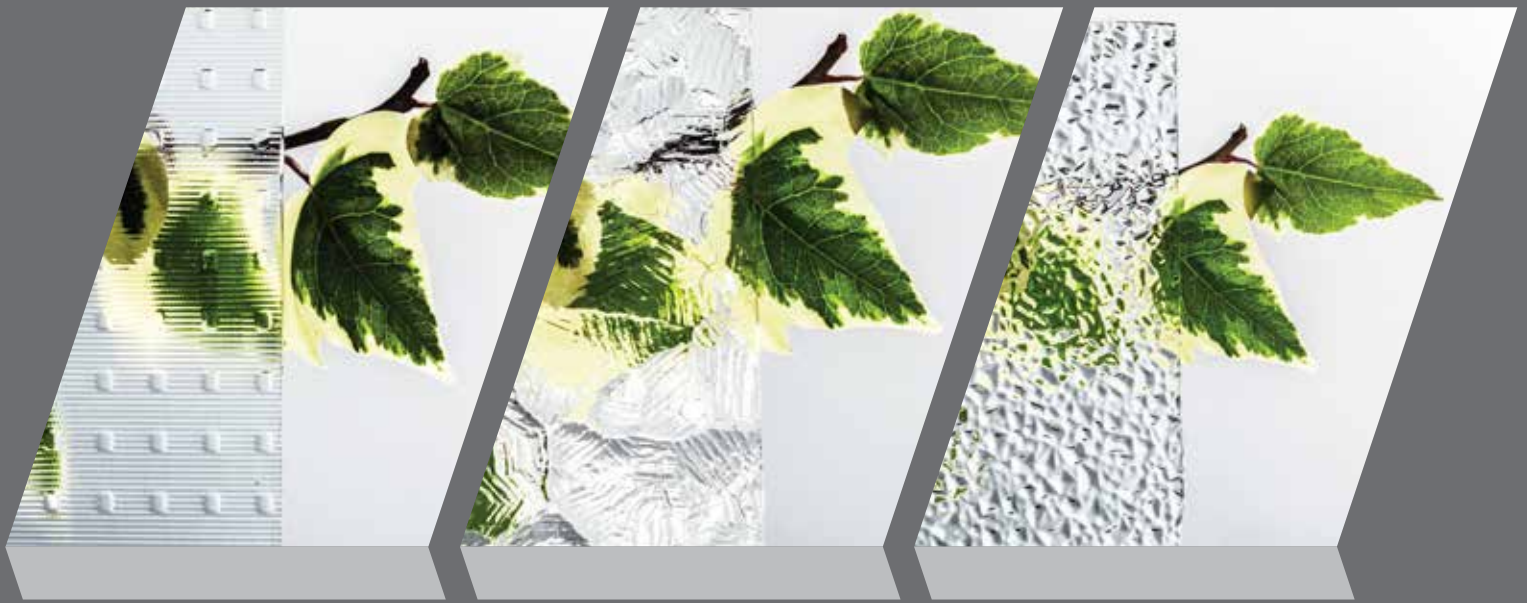
Due to its engraved patterns and the uneven surface of one or both sides, patterned glass disperses any passing light beams to prevent a clear view of the objects behind it. In order to produce this type of glass, the molten glass ribbon is compressed between two rollers, the lower of which is usually patterned on the surface.

Patterned glass can be used for decorative purposes and also for partitions, greenhouse construction and interior/exterior design.

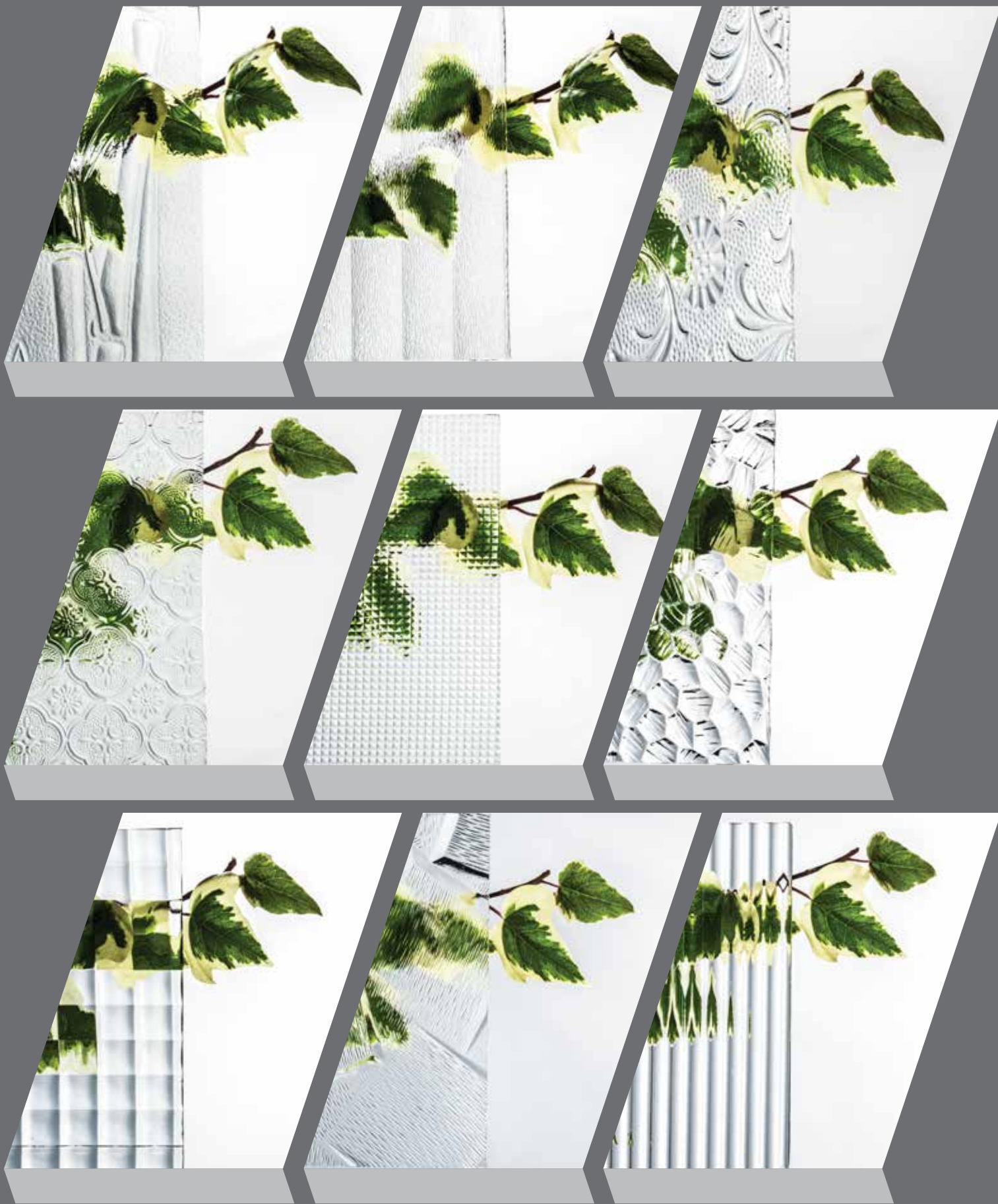
Ghazvin Glass Company currently operates two patterned glass lines with a total capacity of 50,000 ton/year to produce patterned glass in various colours (blue, green, amber, bronze and clear glass) with a range of patterns (frosted, karatachi, cross reed, flora, withy, etc.) and a 4-10 mm thickness range up to 1600 mm in width. The outstanding quality of GGC Patterned Glass has made it one of the most popular brands for this particular product in the region with high demand in the local market and also supply to many neighbouring and Middle Eastern countries.











Secondary Processed Glass

GGC Secondary Processing Unit was established in response to the increasing demand for safe glass products and the trend towards the use of processed glass for saving energy, in line with the management team's strategic vision of improving the company's diversity.

There is a growing need among today's consumers for higher safety, integrity and heat resistance of glass, to which toughened glass provides a successful response. Toughened glass (tempered glass & heat strengthened glass) is widely used in construction of trade centers and other buildings where preventing glass breakage in large pieces is of vital importance. In other words, whenever parameters like mechanical resistance and safety are in question, the use of toughened glass is a wise choice.

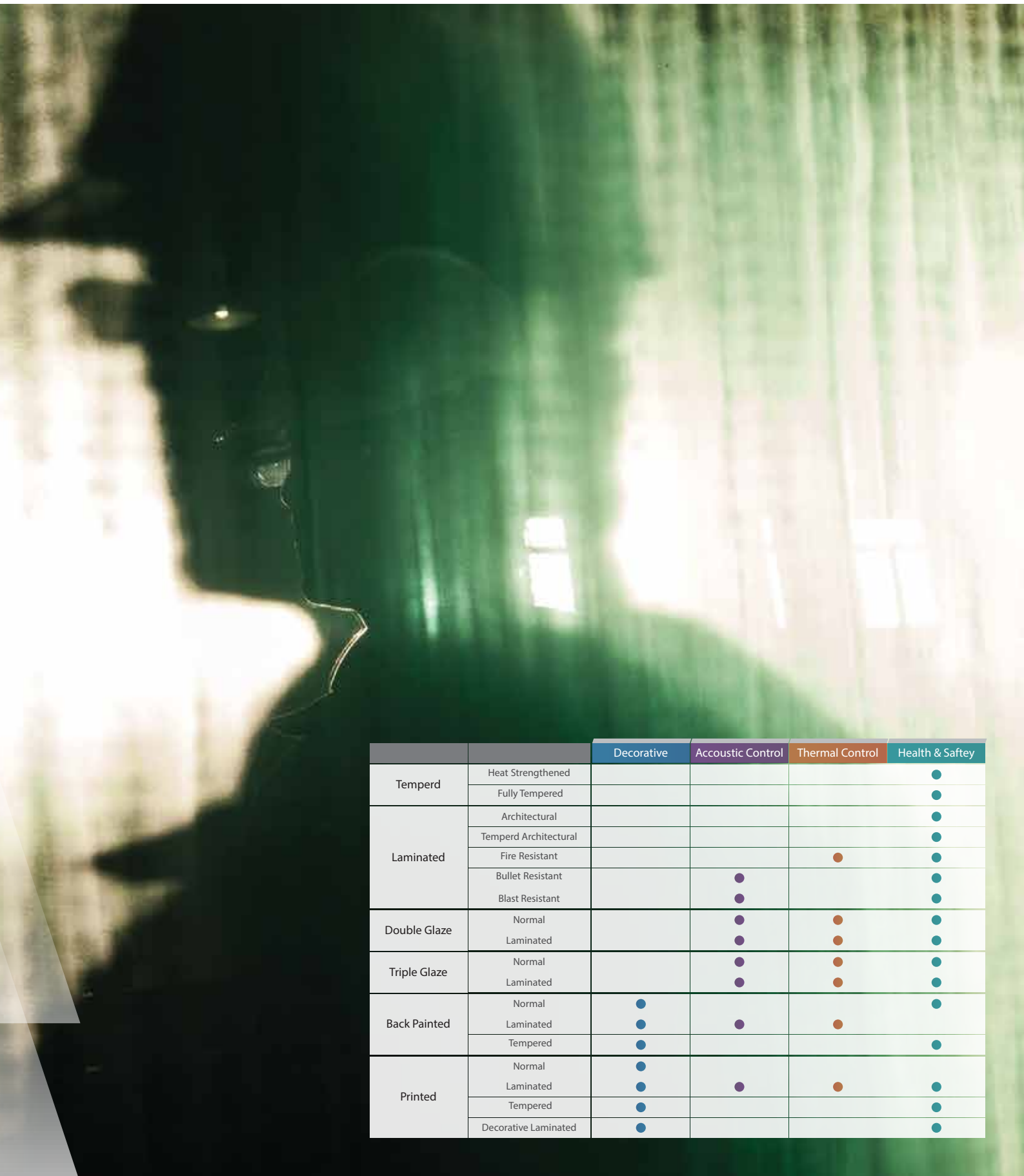
In building construction, toughened glass is used in frameless structures such as entrance gates or any places where people might be in danger of injuries, but where the product is required to impose no reduction in light transmission.

In addition to toughened glass production, GGC has started to produce insulating glass (multi-glazed) to satisfy the needs for energy saving, reducing noise pollution and improving indoor serenity and calmness. Multi-glazed units are made by on putting a separating gas-filled space between the separate panes of glass. Double-glazed and triple-glazed glass panels are made of two or three panes of glass fitted to a particular clearance with a spacer which is filled up with desiccant.

GGC Architectural Laminated Glass Production Line was established in order to offer the laminated product's properties for security and safety. A pane of laminated glass can be used in normal or multi-glazed windows.

Laminated glass simultaneously offers all three advantages of "reducing noise pollution", "improving security" and "providing thermal insulation". This product will not collapse due to a severe impact, as any broken pieces will be held together. At the same time, soundproof layers can be used between the glass panes to reduce the intensity of passing sound waves. Also, according to the UV radiation absorption table provided, a laminated interlayer will absorb sunlight's harmful ultra-violet radiation by 81-98 percent depending on the layer thickness - something which saves fabrics, carpets and furniture from gradual paling.

As part of a decorative glass development plan and in fulfillment of consumers' aesthetic tastes, GGC has started to produce other processed glass products such as decorative laminated glass, back painted glass, printed glass and decorative coated glass.



| | | Decorative | Accoustic Control | Thermal Control | Health & Saftey |
|--------------|-----------------------|------------|-------------------|-----------------|-----------------|
| Temperd | Heat Strengthened | | | | ● |
| | Fully Tempered | | | | ● |
| Laminated | Architectural | | | | ● |
| | Temperd Architectural | | | | ● |
| | Fire Resistant | | | ● | ● |
| | Bullet Resistant | | ● | | ● |
| | Blast Resistant | | ● | | ● |
| Double Glaze | Normal | | ● | ● | ● |
| | Laminated | | ● | ● | ● |
| Triple Glaze | Normal | | ● | ● | ● |
| | Laminated | | ● | ● | ● |
| Back Painted | Normal | ● | | | ● |
| | Laminated | ● | ● | ● | |
| | Tempered | ● | | | ● |
| Printed | Normal | ● | | | |
| | Laminated | ● | ● | ● | ● |
| | Tempered | ● | | | ● |
| | Decorative Laminated | ● | | | ● |

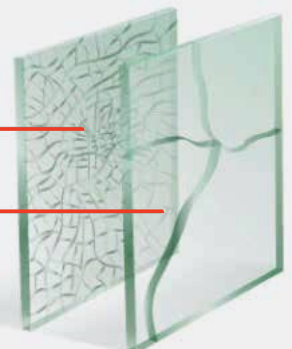


Toughened Glass Production Line

GGC Toughened Glass Production Line was established in 1999 with the newest European technology of the time. In this production line, 4-9 mm glass sheets in a size range of Min 250×200 mm to Max 4,800×2,400 mm could be toughened.

Tempered Glass

Heat Strengthened Glass







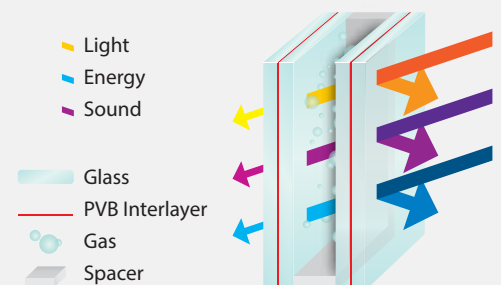
Insulating Glass Unit (Double Glazed, Triple Glazed)

GGC Insulating Glass Production Line uses fully automatic machinery to produce double glazed or triple glazed insulating glass within a size range of min 250×300 mm to max 2000×2500 mm in compliance with European standards.

Nowadays, most double glazed and triple glazed glass panels are manufactured with a combination of flat glass, toughened glass, laminated glass and low-e glass sheets. Insulating glass helps us to save energy and gives us a more secure and safe indoor environment.

tables 2 & 3

Ghazvin Glass Co. currently benefits from the silicone adhesive system (via silicone pump) that made the IGU products incomparable to the local competition







Laminated Glass Production Line

GGC Laminated Glass Production Line is capable of producing multi-layered laminated glass sheets as large as max 3210×2250 mm bonding together at least two 3mm glass sheets up to a maximum total thickness of 50 mm. For instance, a sheet of 50 mm bullet resistant glass is made by bonding 5 sheets of 10 mm glass.

Architectural Laminated Glass

Bullet Resistant Glass

Fire Resistant Glass

Decorative Laminated Glass





Architectural Laminated Glass

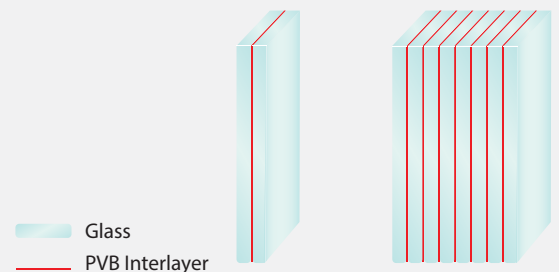
This product looks just like a normal sheet of glass but has a very different function. Energy savings, reduced noise pollution and protection against UV-radiation damages are drawing consumers' attention more than ever before. These goals can be met by the use of architectural laminated glass sheets (toughened or normal). The laminated glass has practical resistance against severe impact, earthquake, storms and strong winds, since the broken glass particles remain bonded to the laminate interlayer.

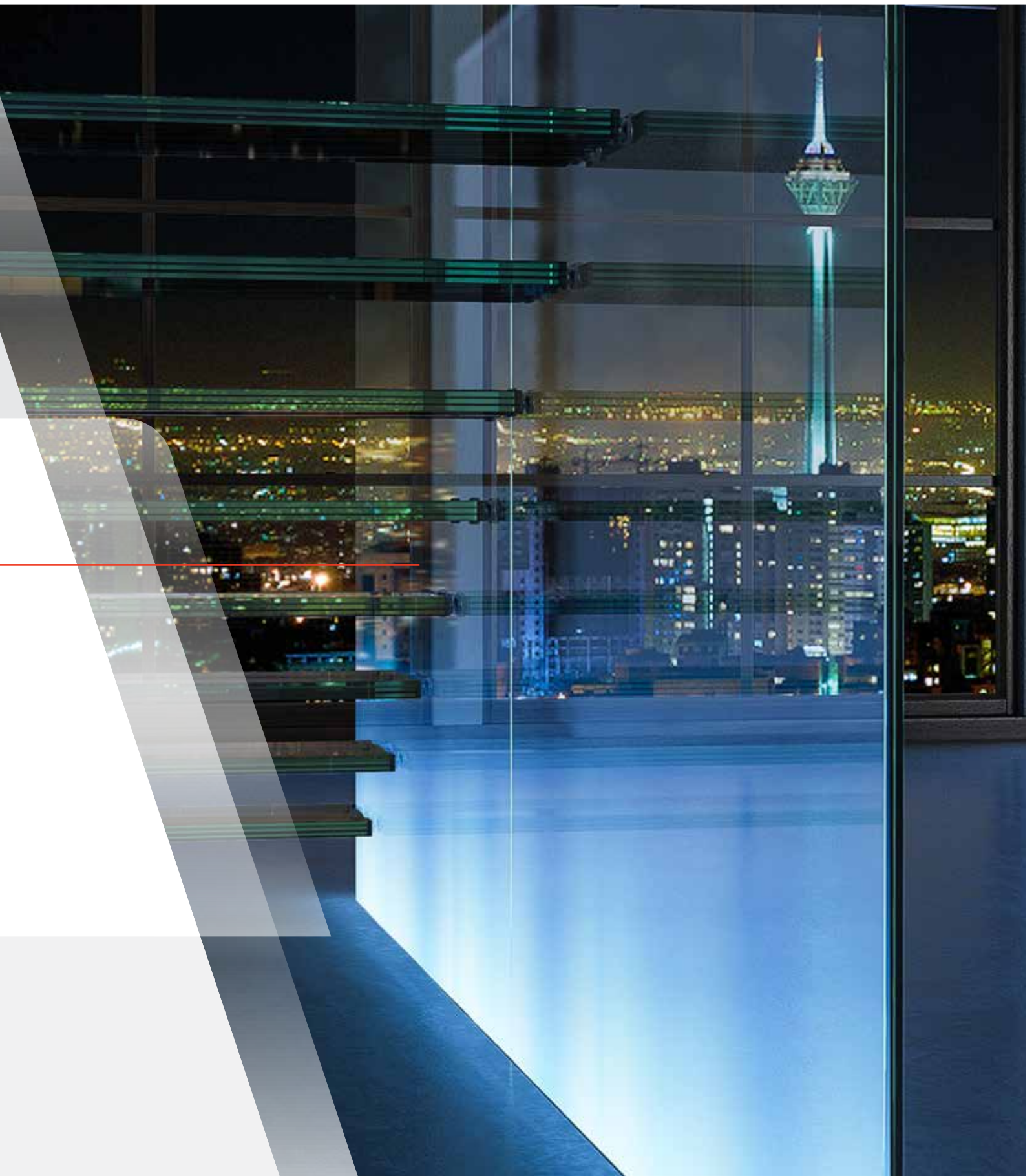
Architectural laminated glass is produced in various colours and can also be layered with other ornamental or functional objects (wire, fabric, posters, etc.) making it a very versatile type of glass indeed.

Nowadays, architectural laminated glass is being widely used in exterior design due to some of its particular advantages:

- Vibration tolerance
- Quick and easy installation (truss, holder clamp, cable, etc.)
- Combinability with other design elements
- Decorative coverage of interior surfaces and / exterior facades

table 4





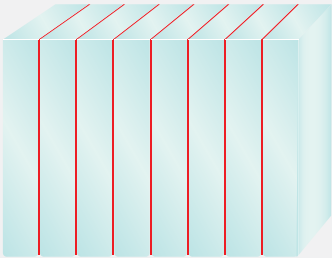


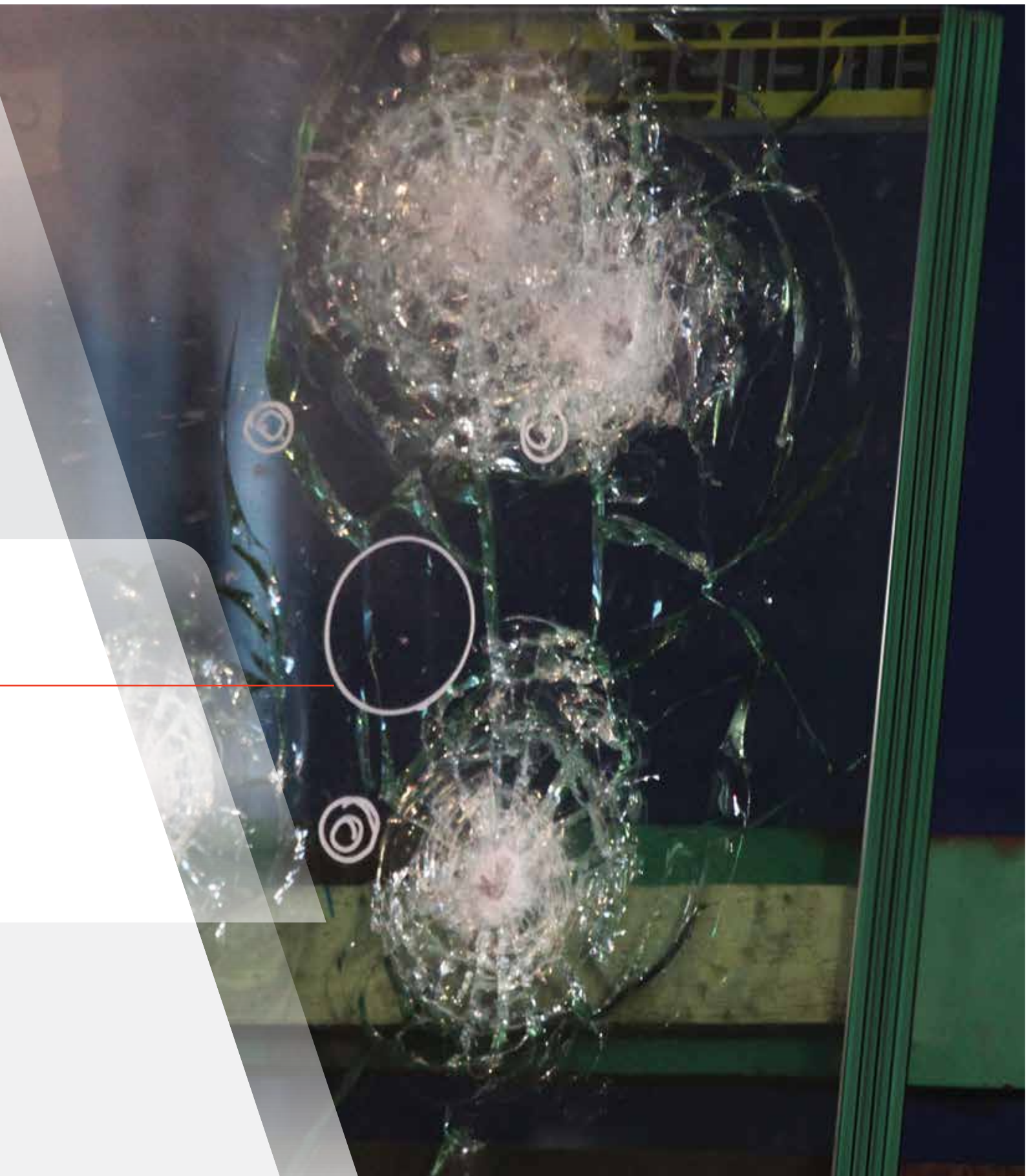
Bullet Resistant Glass

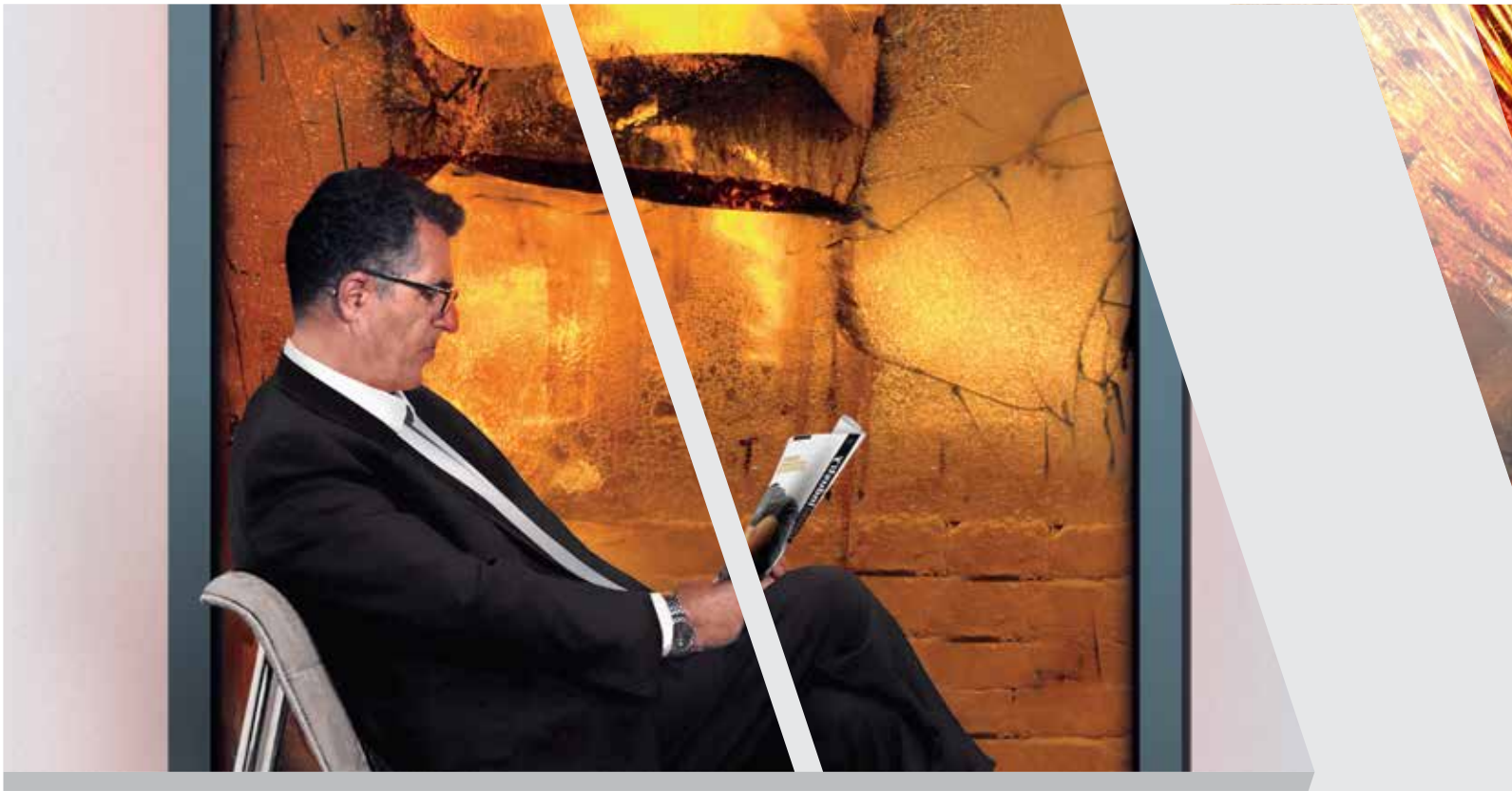
By the use of the architectural laminated glass production machinery combined with its inhouse engineering capacities, GGC has managed to produce a highly resistant glass strong enough to withstand instant and direct impacts. The product is composed of 6, 8 or 10 mm sheets of clear glass laminated with 0.76 to 1.52 mm sheets of PVB and will hold together if hit by the bullets of a Colt pistol and G3 rifle and also against the impact of a mallet and blast shockwaves, without breaking apart into pieces. This type of glass is used in jewellers, exchange shops and banks as an impenetrable barrier preventing criminal damages.

table 6

Glass
 PVB Interlayer



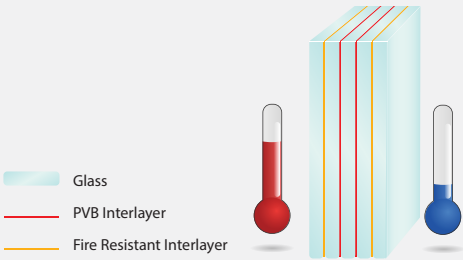


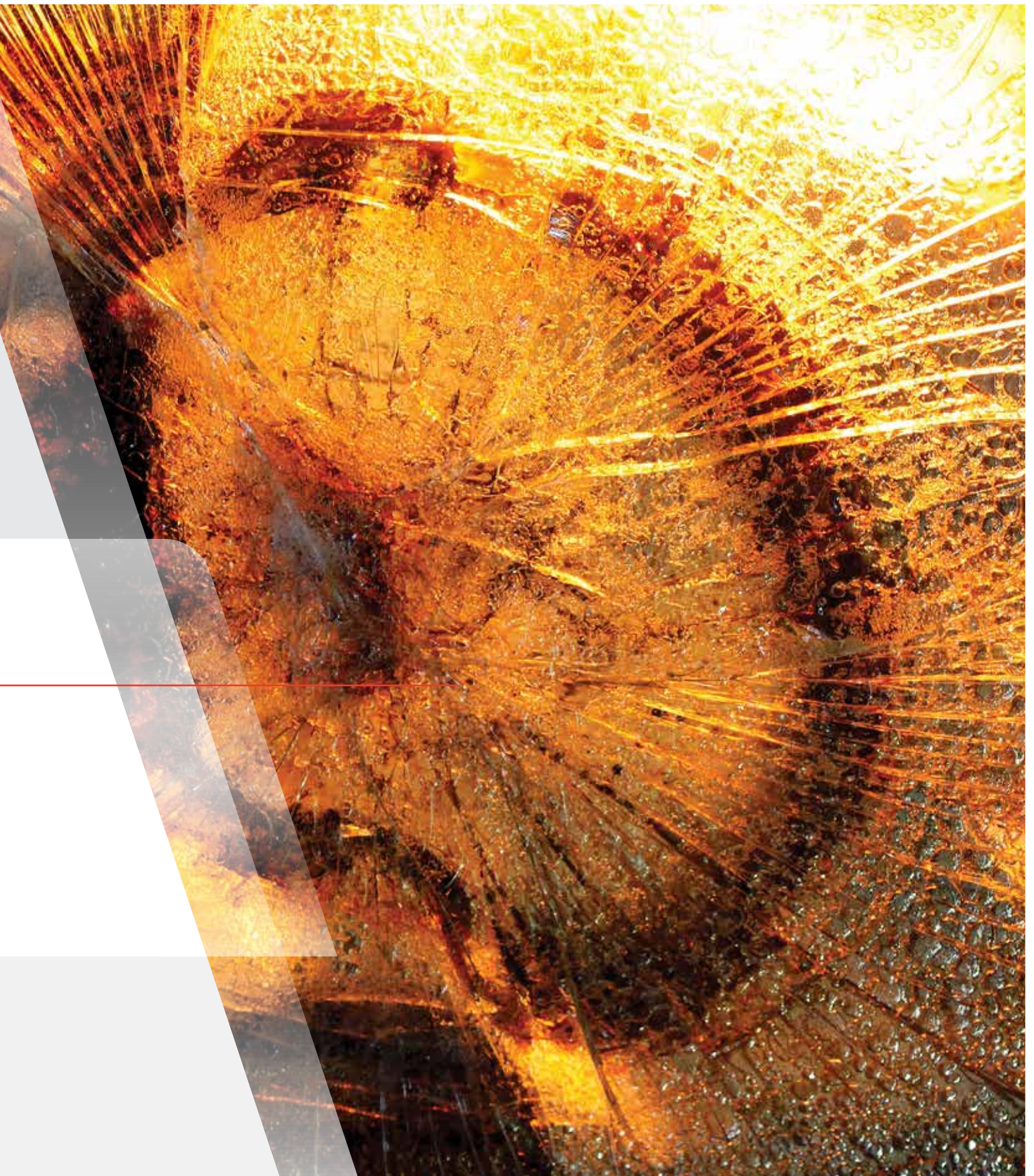


Fire Resistant Glass

This product is a type of insulating glass with a laminated glass sheet of various combined thicknesses on one pane and a 6 or 8 mm toughened glass on the other. The layered glass will endure high temperature for 30 minutes before the PVB layer starts to burn. During this time, the space between the two sides will function as insulation, impeding extensive heat transmission to the other side and giving the inhabitants time to leave the building. In case of long lasting fire or a significant increase in temperature, the outer-side toughened glass pane will also prevent heat transmission for some time after all the PVB layers of the other pane are entirely burned. This product is specified according to its "thermal resistance" and "stability time". GGC #GF-3 is a fire resistant glass with total thickness of 59 mm and maximum stability time of 90 min against 850° C.

table 7





Decorative Laminated Glass

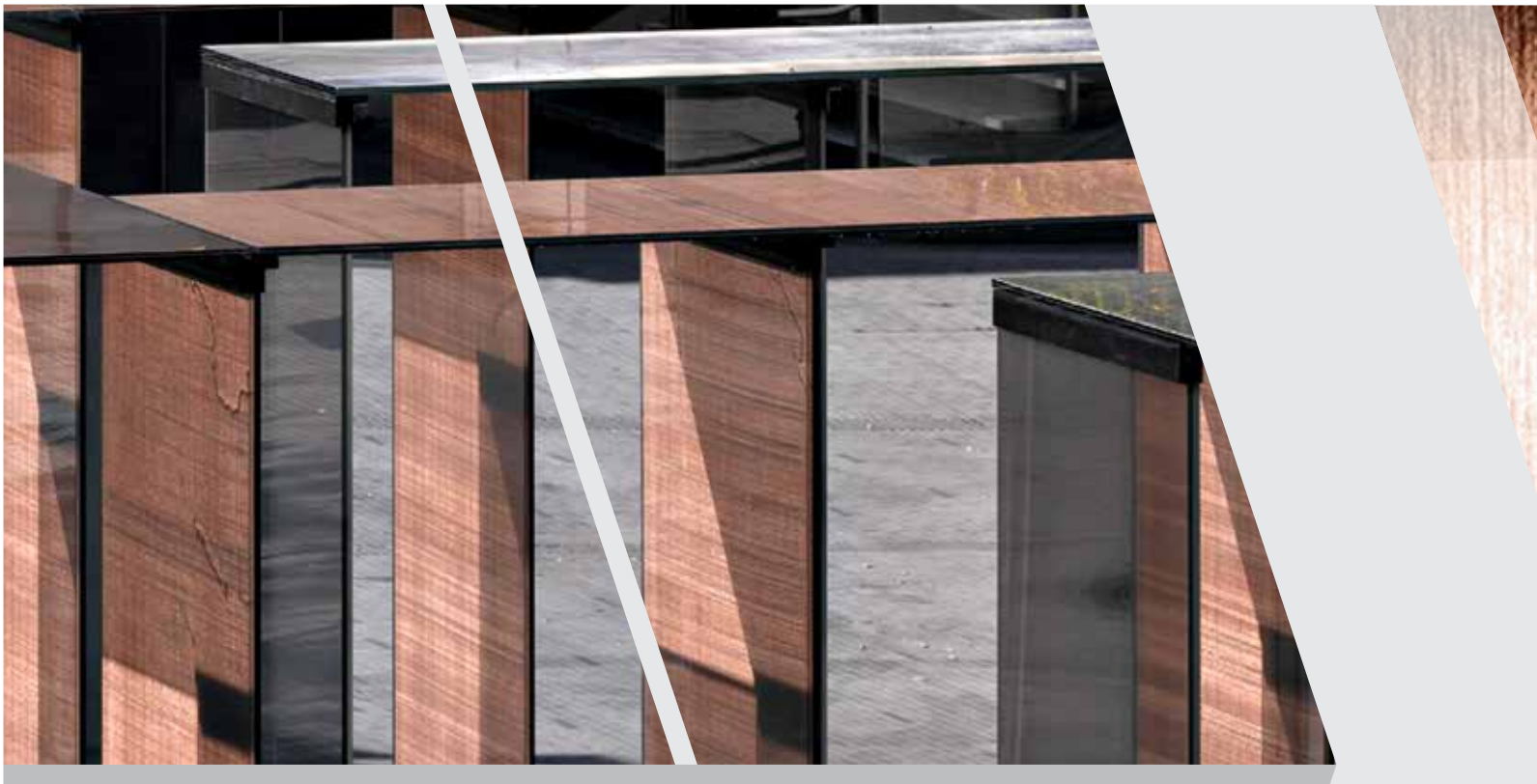
GGC has an extensive range of decorative glass products. Coated glass is a popular decorative glass product, offered with various types of coatings. Some of these coatings have merely practical properties while others suit both practical and decorative purposes. Decorative glass might be the end-result of one or more processing works (laminating, toughening, etc.) in a production cycle. During the production procedures, the design is reproduced on the glass sheet (by the use of organic or non-organic materials such as enamel or ceramic frit) or a thin layer of the glass surface is removed by engraving, sand blasting or acid etching to leave behind the desired design. Other processes such as CNC cutting, drilling, bevelling or polishing are available as required. Brief descriptions of various types of decorative glass, including decorative laminated glass and decorative coated glass (i.e. back painted glass, silkscreened glass and printed glass) can be found elsewhere in this catalogue.

Back Painted Glass

Silkscreened Glass

Printed Glass





Decorative Laminated Glass

This product is made by bonding together two or more sheets of glass with one or more polymer films. In addition to tinted polymer films which may offer a variety of colour combinations on their own, the customer may also order other objects such as fabric, paper, leaves, wire, etc. to be inserted between the layers or to have the final product cut in particular shapes.





Back Painted Glass

Traditionally, tinted glass has been used as an architectural symbolic element for lifestyle in various nations, including Iran. However, back painted glass can differentiate in other ways more suited to modern life; new colours representing new trends.

As a glassmaker in possession of modern technologies, Ghazvin Glass Company has progressed towards the production of back painted glass which offers many capabilities, qualities and uses. Natural colour back painted glass with its full spectrum of colours provides opportunities for creativity in construction, furnishing and interior design of offices and houses. Artists, architects, designers, photographers and engineers are starting to use back painted glass with more and more satisfaction.

Inspired by designers and architects, GGC has applied its determination to promote innovation by the use of fully automatic machinery of the newest technologies to produce vivid and beautiful back painted glass for various purposes in a wide range of colours.

Back painted glass enjoys a number of particular advantages:

- Beautiful and distinctive for interior design decoration
- Shielding UV radiation
- Anti-scratch and anti-bacterial
- Alternatives of matte finishing (by sandblasting, etching, etc.)
- Capable of being cut and machined
- Capable of being toughened, laminated or incorporated in an insulating panel





Silkscreened Glass

GGC Downstream Processing Unit has the facilities required for secondary processing of silkscreened glass (toughening, laminating or insulating units).

As a suitable decorative element for any sort of space, silkscreened glass can be used in regular, irregular or complex geometric shapes.

The resulting patterns can be installed on glass roofs, artificial walls, corridor walls and so on.

This product is also offered with an additional option where the customer may modify the available patterns to their own design.





Printed Glass

Printed glass is an ideal media for artists, photographers and designers who wish to make their artworks durable on a sheet of glass or between two sheets.

Provided that the printable material is in compliance with related laws and regulations, printed glass can be used for marketing and other purposes in an artistic interaction with digital technology.

One particular process involves printing a high resolution image (1440×1440 dpi) on a sheet of glass or between two sheets of glass to be laminated. This hi-tech professional printing procedure is implemented by 6 colours plus white (CMYK-Lc-Lm-White).

Printed glass is a memorable decorative element for

interior spaces and will resist against any colour change for 50 years in open air spaces.

Ghazvin Glass co currently prints via UV-Ink printer which is one of many methods for achieving printed results. Some customers have opted to have their own patterns and images printed on the sheets of glass to modify their interior design projects to their own taste.

Any ordered image needs to be of high resolution and compatible with the printer.

It is worth emphasising that all types of coated glass are capable of being toughened (or any sort of secondary processing). These products are the embodiments of beauty, strength and safety.





Primary Processing Unit (Preparation for secondary processing)

It is necessary to accomplish all primary processing practices like bevelling, drilling, cutting out and so on, before the toughening process.

In the primary processing unit, a CNC cutting table first cuts the ordered regular or irregular geometric patterns out of a large sheet of glass and the pieces are then sent for the required processing.

Moving on from the primary product, float glass, to our secondary processed products we have a wide range of applications. Home appliances use processed glass because it is a durable, tough, and safe material which after printing or engraving can be trendy as well as practical. The table below shows the various processes available for kitchen appliances.





Packing and Dispatching of Sheet Glass

Maintaining high quality, avoiding damage, providing orderly packing and achieving customer satisfaction are the top priorities of Ghazvin Glass Company. As "packing" and "dispatching" are two essential tasks in the industry, GGC has built on the long experience of a competent staff to develop an efficient platform these tasks to be done in accordance with the product type and its destination.

In accordance with customers' requirements, the glass can be bulk-packed, shrink-packed or packed in wooden boxes and then dispatched on various types of stillages (A-frame, L-frame, etc.).

1- Packing on portable metal stillages:

This approach is suitable for short distance delivery of the product with easy loading and unloading requirements.

2- Packing in wooden boxes (direct pallet loading):

This approach is suitable for long distance delivery of the product with highly efficient delivery requirements.

Table 8





Quality Control and Laboratory

Quality determines a particular product's ranking among similar commodities. With all the equipment and machinery of Ghazvin Glass Company supplied by the most respected European providers of technologies (Pilkington in UK, LiSEC in Austria, Tamglass in Finland, etc.), the quality of GGC products combined with the performance of its skilled operators has led to the achievement of ISIRI and Quality Management licenses. The company has been granted the official certificate and license of the Institute of Standards and Industrial Research of Iran (ISIRI) to produce different types of glass and is accordingly committed to observation of the regulations and accomplishment of raw material and

final product examinations. GGC Quality Control Unit analyses the specifications and combinations of any raw material cargos and their related batches before being fed into furnace and controls the produced glass in respect of physical features, optical functions, resistance, fragility, thermal stability, light fraction, impact penetration and a few other aspects. Inappropriate packing and delivery may harm the quality of the produced glass. GGC Quality Control Unit is committed to control and investigate all subsequent stages of production, packing, etc. and take necessary steps to solve any possible quality issues to achieve customers' satisfaction.

Table 9





R&D

Ghazvin Glass Company has always placed a great emphasis upon research and development. The history of GGC R&D dates back to 1980s and the students of that time are now managers in many Iranian glass production facilities. At present, a new R&D and library building is being constructed in a considerable building area in Farsejin Float Plant and it is expected that this infrastructure will encourage the company's young engineers to keep the same pace of perseverance in dedicating themselves to research works for a better future of our beloved country and Iranian society.

GGC R&D has had many progressive functions such as developing market entry, designing new products, offering new services and entering new industries. Additionally, the unit has always had the responsibility to study any strategic plans towards the company's industrial goals and communicating them to operating sections.

Some of these plans can be listed as follows:

1. Market analysis and detecting the standing of the company; Defining environmental marketing requirements; Participating in local and international exhibitions and seminars.
2. Investigating the human resources infrastructure; Holding training courses.
3. Studying the status of close and remote competitors; Holding mutual meetings in order to achieve better cooperation.
4. Data analysis and studying the status of the company
5. Classifying internal and external competitive capabilities; Designing logos, forms, etc.
6. Detecting and recognizing the newest products offered by international pioneers in the global market. Implementing the related feasibility studies and taking measures towards production and offering the commodity.
7. Detecting and recognizing scientific and technical resources for the company's library; introducing new resources to other technical engineers.



Ghazvin Glass has complete access to the Pilkington's R&D laboratories which provides unique opportunity.



Consulting and Design Services

Glass is a product with two distinct properties: "transparency" and "fragility". Its transparency has made glass a highly useable element in architecture and other industries while its fragility has been a limiting factor.

Production of patterned glass, float glass and various processed glass products in Ghazvin Glass Company has paved the way for a wider and more practical use of glass, exploiting its transparency and managing its fragility.

With 45 years of experience as a glass producer and enjoying the advantage of cooperation with the most competent local engineers perfectly familiar with Iranian and international standards and also benefiting from

ongoing interactions with the most outstanding global engineering teams, GGC Consulting and Design Unit is honoured to offer a variety of consulting, design and technical support services as listed below:

Definition of the required type of glass product to meet particular customer needs.

Definition of the size, thickness and type of the required glass product in accordance to the application in question.

"Value engineering" services.

Consultancy services on particular glass installations and structures.



Technical Glass float clear

Table 1

| Product Name | Thickness | Light Transmittance Specification | | Heat Transmittance Specification | | | | | | | Noise Reduction |
|-------------------|-----------|-----------------------------------|-----|----------------------------------|------|------|-------|-----|-----|---------------------|-----------------|
| | | LT% | LR% | SF% | SC | DET% | Uvtr% | ER% | EA% | UG $\frac{W}{m^2K}$ | |
| Glass float clear | 3 | 90 | 8 | 88 | 1 | 86 | 67 | 8 | 6 | 5.8 | 29 |
| Glass float clear | 4 | 90 | 8 | 87 | 1 | 86 | 64 | 8 | 8 | 5.7 | 30 |
| Glass float clear | 6 | 89 | 8 | 84 | 0.97 | 81 | 56 | 7 | 12 | 5.7 | 31 |
| Glass float clear | 8 | 88 | 8 | 82 | 0.94 | 78 | 51 | 7 | 15 | 5.6 | 32 |
| Glass float clear | 10 | 87 | 8 | 80 | 0.92 | 75 | 47 | 7 | 18 | 5.6 | 34 |
| Glass float clear | 12 | 86 | 8 | 78 | 0.9 | 72 | 44 | 7 | 21 | 5.6 | 35 |

Technical Multi Glaze Glass

Table 2

| Product Name | Thickness | Light Transmittance Specification | | Heat Transmittance Specification | | | | | | | Noise Reduction |
|----------------------|-------------|-----------------------------------|-----|----------------------------------|------|------|-------|-----|-----|---------------------|-----------------|
| | | LT% | LR% | SF% | SC | DET% | Uvtr% | ER% | EA% | UG $\frac{W}{m^2K}$ | |
| Double glaze | 4-6-4 | 81 | 15 | 77 | 0.89 | 72 | 47 | 13 | 15 | 3.3 | 29 |
| Double glaze | 4-12-4 | 81 | 15 | 70 | 0.8 | 68 | 47 | 13 | 20 | 2.9 | 34 |
| Double glaze | 4-16-4 | 81 | 15 | 67 | 0.78 | 65 | 47 | 13 | 20 | 2.7 | 36 |
| Double glaze Fxx | 6-16-*4 | 35 | 36 | 58 | 0.67 | 60 | 17 | 34 | 20 | 2.7 | 37 |
| Double glaze Fxx | 4-16-*6 | 37 | 35 | 55 | 0.66 | 58 | 17 | 34 | 20 | 2.6 | 38 |
| Double glaze - Low-e | 4-6-e6 | 59 | 11 | 44 | 0.51 | 37 | 14 | 31 | 48 | 2.7 | 29 |
| Double glaze - Low-e | 4-12-e6 | 57 | 11 | 44 | 0.48 | 33 | 14 | 31 | 50 | 2.3 | 34 |
| Double glaze - Low-e | 4-16-e6 | 57 | 11 | 44 | 0.45 | 30 | 14 | 31 | 55 | 2.1 | 36 |
| Triple Glaze | 4-10-4-10-4 | 70 | 18 | 48 | 0.55 | 41 | 21 | 10 | 25 | 0.8 | 39 |
| Triple Glaze | 6-10-6-10-6 | 68 | 17 | 47 | 0.54 | 38 | 21 | 10 | 30 | 0.7 | 43 |

Table 3

| Products name | Thickness | Light Transmittance Specification | | Heat Transmittance Specification | | | | | | | Noise Reduction | Safety / Tolerance |
|------------------|---------------|-----------------------------------|-----|----------------------------------|------|------|-------|-----|-----|--------------------------|-----------------|--------------------|
| | | LT% | LR% | SF% | SC | DET% | Uvtr% | ER% | EA% | Ug (W/m ² .k) | Rw (db) | Class EN 1260 |
| Laminated | 3/0.76/3 | 89 | 8 | 80 | 0.92 | 78 | 1 | 6 | 17 | 5.7 | 32 | 2B2 |
| Laminated | 4/0.76/4 | 88 | 8 | 78 | 0.9 | 78 | 1 | 6 | 20 | 5.6 | 34 | 2B2 |
| Laminated | 6/0.76/6 | 86 | 8 | 74 | 0.85 | 75 | 1 | 6 | 25 | 5.5 | 35 | 1B1 |
| Laminated | 3/1.52/3 | 89 | 8 | 79 | 0.91 | 76 | 1 | 6 | 19 | 5.6 | 37 | 1B1 |
| Laminated | 4/1.52/4 | 88 | 8 | 77 | 0.89 | 76 | 0.67 | 5 | 21 | 5.5 | 33 | 1B1 |
| Laminated | 6/1.52/6 | 86 | 7 | 73 | 0.84 | 72 | 0.67 | 5 | 27 | 5.4 | 35 | 1B1 |
| Laminated | 10/1.52/10 | 82 | 7 | 67 | 0.77 | 70 | 0.5 | 5 | 36 | 5.2 | 36 | 1B1 |
| Laminated | 12/1.52/12 | 80 | 7 | 65 | 0.75 | 66 | 0.5 | 5 | 40 | 5.1 | 39 | 1B1 |
| 2Glaze laminated | 4/1.52/4-12-6 | 78 | 8 | 52 | 0.56 | 43 | 0.67 | 10 | 43 | 2.4 | 37 | 1B1 |
| 2Glaze laminated | 6/1.52/6-16-6 | 76 | 8 | 48 | 0.55 | 41 | 0.67 | 12 | 45 | 2.1 | 39 | 1B1 |
| 2Glaze laminated | 6/1.52/6-12-8 | 77 | 8 | 48 | 0.48 | 38 | 0.67 | 12 | 40 | 2.3 | 39 | 1B1 |
| 2Glaze laminated | 6/1.52/6-16-8 | 76 | 8 | 45 | 0.46 | 36 | 0.67 | 12 | 40 | 2.1 | 41 | 1B1 |
| 2Glaze laminated | 6/1.52/6-20-6 | 75 | 8 | 44 | 0.46 | 37 | 0.67 | 12 | 42 | 2 | 42 | 1B1 |

Heat Transmittance Table

Table 4

| Double Glazing Spacer | U-Value $\frac{W}{m^2K}$ | | |
|--------------------------------------|--------------------------|-------|---------|
| | 6 mm | 12 mm | + 16 mm |
| Double Glazing 4mm - Air | 3.1 | 2.8 | 2.7 |
| Double Glazing 4mm - Argon Gas | 2.9 | 2.7 | 2.6 |
| Double Glazing 4mm - Low-e Air | 2.7 | 2.3 | 2.1 |
| Double Glazing 4mm - Low-e Argon Gas | 2.5 | 2.1 | 2 |
| Wooden Door | | 3 | |

Wasted Energy= Windows area x Difference between in and out side temperature x U value

Less U value = less wasted energy.

for Low-e glasses mentioned in above table. En=0.2

PVB Interlayer UV Transmittance percentage table

Table 5

| UV Transmittance % | Laminate Specication |
|--------------------|----------------------|
| ≥ 18 | 0.38 mm |
| ≥ 4.5 | 0.76 mm |
| ≥ 1.25 | 1.14 mm |
| ≥ 1 | 1.52 mm |

proved UV raydiance is 380nm

Bulletproof Glass Specification

Table 6

| No. | Gun Type | Procducts Code | Total Thickness (mm) | Bullet Speed (m/s) | Interpenetrate level | Shooting Distance (m) | Breaking Last Layer |
|-----|-----------------------|----------------|------------------------|----------------------|----------------------|-------------------------|---------------------|
| 1 | 375 Magnum | 1 GB | 38 | 425 | NO | 3 | NO |
| 2 | .44 Magnum | 2 GB | 42 | 426 | NO | 3 | NO |
| 3 | 7,62 x 39 Kalashnikov | 3 GB | 57 | 711 | NO | 10 | NO |
| 4 | 7,62 x 51 G3 | 4 GB | 79 | 828 | NO | 10 | NO |

Fireproof Glass Specification

Table 7

| No. | Products Code | Total Thickness | Rate of temp Increasment C° / Min | Max Temperature (C°) | steady Period Length |
|-----|---------------|-----------------|-----------------------------------|----------------------|----------------------|
| 1 | 1-GF | 36 | 30 | 540 | 30 |
| 2 | 2-GF | 44 | 35 | 700 | 60 |
| 3 | 3-GF | 59 | 35 | 850 | 90 |

Table 8

| According to GGC tech in formation | Glass Type | Size | No. in box | Area M2 | Weight Each Box (KG) |
|---|------------|------------|------------|---------|----------------------|
| | 2 | 21/3×2 | 65 | 3/417 | 50/2086 |
| | 2 | 50/2×605/1 | 88 | 1/353 | 50/1765 |
| | 6/2 | 21/3×55/1 | 65 | 41/323 | 15/2102 |
| | 6/2 | 70/1×53/1 | 65 | 06/169 | 92/1098 |
| | 6/2 | 21/3×37/1 | 65 | 85/285 | 03/1858 |
| | 6/2 | 04/3×66/1 | 65 | 02/328 | 10/2132 |
| | 6/2 | 21/3×2 | 42 | 64/269 | 66/1752 |
| | 3 | 50/2×605/1 | 58 | 72/232 | 44/1745 |
| | 5/3 | 21/3×25/2 | 36 | 01/260 | 09/2275 |
| | 5/3 | 50/2×605/1 | 50 | 63/200 | 47/1755 |
| | 4 | 21/3×50/2 | 31 | 77/248 | 75/2487 |
| | 4 | 21/3×25/2 | 31 | 9/223 | 98/2238 |
| | 4 | 21/3×134/2 | 31 | 35/212 | 54/2123 |
| | 4 | 50/2×605/1 | 43 | 54/172 | 38/1725 |
| | 5 | 21/3×25/2 | 25 | 56/180 | 03/2257 |
| | 5 | 50/2×605/1 | 35 | 44/140 | 47/1755 |
| | 6 | 21/3×60/2 | 21 | 26/175 | 99/2628 |
| | 6 | 21/3×25/2 | 21 | 67/151 | 09/2275 |
| | 6 | 50/2×605/1 | 29 | 36/116 | 44/1745 |
| | 8 | 21/3×60/2 | 15 | 19/125 | 80/2503 |
| | 8 | 21/3×25/2 | 15 | 34/108 | 75/2166 |
| | 8 | 50/2×605/1 | 22 | 27/88 | 50/1765 |
| | 10 | 21/3×60/2 | 13 | 49/108 | 45/2712 |
| | 10 | 21/3×25/2 | 13 | 89/93 | 31/2347 |
| | 10 | 21/3×134/2 | 13 | 05/89 | 30/2226 |
| | 10 | 50/2×605/1 | 18 | 22/72 | 63/1805 |
| | 12 | 21/3×134/2 | 11 | 35/75 | 55/2260 |

Table 7

| | | | |
|-------------------|--|------------------------|---|
| Product Name | Green Float glass common soda-lime | Certification | 10673-2 Bulding Material Ceritification |
| Size | As customers' requirement | Thickness | As customers' requirement |
| Tolerance of size | ± 2 mm | Tolerance of thickness | ± 0.1 mm |
| Line of Draw | Perpendicular to the large side | Apparent defect | without any defect |
| Packing | Wooden crates with metal belt fastened(as customers' requirement) | | |
| Using | It,s widly used for many fields, such as Glass walls, windows, doors, It can be decorative glass, temperd glass, insulated glass & Security glass | | |

| CRI.Test(Coparative Ream Indicator) | | | | | Standard degree > 30° | | | | |
|-------------------------------------|----|----|----|--------------------|-----------------------|----|----|----|-----------------|
| Bow & Dish Test Results | | | | Standard Tolerance | Zebra Test Result | | | | Standard Degree |
| LE | LC | RC | RE | <8 mm | LE | LC | RC | RE | > 45° |

| Value of light Trancmittance & light Reflection | | | | It must be Measured in different Wavelength According to Iran national Standard | | | |
|---|-------|-------|------|--|--------|-----------------------------|-----|
| Thickness | LT | LR | SL | SLR | Result | Abbreviation signs | |
| | | | | | | (Light transmittance) | L |
| 2.2 | 84.68 | _0.08 | 0.89 | _0.08 | ok | (Light reflection) | LR |
| 3.3 | 82.44 | _0.08 | 0.87 | _0.08 | ok | (Solar light transmittance) | SL |
| 3.5 | 82.44 | _0.08 | 0.86 | _0.08 | ok | | |
| 4 | 80.32 | _0.08 | 0.85 | _0.08 | ok | (Solar light reflection) | SLR |
| 5 | 78.34 | _0.08 | 0.83 | _0.08 | ok | | |
| 6 | 0.89 | _0.08 | 0.81 | _0.08 | ok | | |

| chemical composition | | | | | | | | |
|----------------------|----------------|-----------------|--------------|---------------|---------------|-----------------|-----------------|-----------------|
| Sample | Sio2% | Fe2o3% | Al2o3% | Cao% | Mgo% | NA2o% | K2o% | So3% |
| Glass sample | 71/49 | 0/51 | 1/04 | 9/29 | 3/68 | 13/67 | 0/24 | 0/25 |
| Tolerance | 71/5 \pm 0/5 | 0/52 \pm 0/01 | 1 \pm 0/05 | 9/1 \pm 0/5 | 3/8 \pm 0/2 | 13/7 \pm 0/07 | 0/24 \pm 0/05 | 0/25 \pm 0/01 |
| Result | ok | ok | ok | ok | ok | ok | ok | ok |

| Colorimetry Result (Tested by RGB colorimetry method) | | | |
|--|--------|-------|--------|
| Thickness | A* | B* | L* |
| 2.2 | 3.093- | 0.553 | 93.847 |
| 2.5 | 4.091- | 0.486 | 93.039 |
| 3.3 | 4.243- | 0.514 | 92.883 |
| 3.5 | 4.726- | 0.736 | 92.352 |
| 4 | 5.327- | 0.435 | 91.955 |
| 5 | 6.277- | 0.696 | 91.066 |

| | |
|-----------|---|
| Advantage | Timely delivery (within 20-15 working days after receipt of the deposit) |
| | More than 40 years of manufacturing and exporting in glass field |
| | Can be cut , bent,tempered,heat strengthened |
| | Final quality control after loading |
| | First grade quality |
| | Professional loading |
| | Smooth float glass |
| | Strong in hardness |

| | |
|---|---------|
| Light Transmission | LT % |
| Light Reflection | LR % |
| Solar Factor | SF % |
| Direct Energy Reflection | ER % |
| Direct Energy Transmission | DET % |
| Shading Coefficient | SC |
| Heat Transmittance | U-Value |
| Sound Reduction | RW |
| When using 2 glass sheets and 1 PVB interlayer prevent user from accidental cut | 2 B 2 |
| When using 2 glass sheets and 2 PVB interlayers prevent user from accidental spattering | 1 B 1 |

Name

Glass industry foundations

Articles collections within the glass industry

Articles collections within the environment and glass industry

Refractories

Relevant notes

| University name | Student name / Year | Thesis topic | Supervisor name | To a degree |
|--|---|---|---------------------------------------|-------------------------|
| Tarbiat Moaalem | Maryam Yazdani 1998 | Measurement of Sulfur in clear and amber glass by Spectrophotometric methods | Mr. Komaili | Master of Chemistry |
| International Emma Khomeini University | Roghiyeh Nemati 1998 | Formulation of Shamout refractory mortar | In association with Ghazvin Glass Co. | Ceramic Engineering |
| Tehran University Polotechnic | Abolfazl Moradi 2000 | Investigation for finding pure Dolomite Ore for using in Glass Industry at Takestan | In association with Ghazvin Glass Co. | Master Degree |
| Amirkabir University | Mohamad Mehdi Mofateh 1988 | Low efficiency cement production and solution for improving efficiency | In association with Ghazvin Glass Co. | Master Degree |
| Tehran University Polotechnic | Akbar Mansori 1998 | Float Glass technology and drawing simulation for the process | Mr. Komaili | Master Degree |
| Azad University | Mahmod Torkaman 1999 | Preparation of Aluminum Silicate ramming refractory for using in Glass industry | In association with Ghazvin Glass Co. | Master Degree |
| Azad University | Ghafari / Rozbehani / Nasiri / Khanaala 1998 | Maths and energy balance for furnace No. 4 | In association with Ghazvin Glass Co. | BS Chemical Engineering |

| Name | Authors | Publication date |
|---|----------------|---|
| The future of glass sheet industry in Iran | July 1998 | Abdol Majide Zaheri |
| Intorudction on the coated galss in construction | May 1996 | Mohamad Hassan Malek Afzali |
| Specifiction and application of Selenium in the galss making | June 1996 | Mehdi Ashtiani |
| Introduction to the reflective glass | August 1996 | Davood Kamily Birjandi Alireza Aghaee Mobidi |
| Electric furnace for glass melting | March 1997 | Aboulghaseme Emami |
| Utilisation of the electro booster in glass furnace | 2006 | Davood Kalimy Birjandi Alireza Aghaee Mobidi |
| Glass indusrty and the environment | April 2002 | Mohamad Reza Sadeghi |
| Indirect method of Sulfide Ion determination in glass via atomic absorption spectroscopy | March 2002 | Parisa Shahnaee |
| serium oxide in enriching element | March 2002 | Amir Hossein Kazemi |
| detection of seeds (stone) in glass | July 1997 | Kambiz FarHomand |
| Analisis for the uncordinated chemical glass via the chemical ingraving | July 1997 | Ahmad Reza Dosti |
| Bubbles in glass | October 1997 | Abolghaseme Emami |
| Propoerties of cermaic glass's crystalisation for machine ready state | October 1997 | Ahmad Dosti |
| Control of molten glass convection current in malting tank by efectrical boosting | April 1998 | Davood Kalimy Birjandi |
| resistance of furnace cleining arches | April 1998 | Abolghaseme Emami |
| detection of the chemical uncordination defects in glass and diognose its roots | April 1998 | Ahmad Reza Dosti |
| factors that increases the life of silca break in sodalime glass furnace during the melting | June 1998 | Davood Kalimy Birjandi |
| measuring the rodex in cullet | September 1998 | Mehdi Ashtiani |
| flat glass inducstry in the world | October 1998 | Alireza Abasi |
| photochromic glass making via the Ion exchange | 1998 | Ahmad Reza Dosti |
| flat glass inducstry in the world | January 1999 | Alireza Abasi |
| the stone in glass | January 1999 | Ali Zhian |
| flat glass in health and safety | July 1999 | Ahmad Reza Dosti |
| glass furnace bottom structure | July 1999 | Mehdi Ashtiani |





Ghazvin Glass Co.

No. 13 , Sarafraz St., Beheshti St., Tehran - Iran

P.O. Box: 15875-1665

Tel: +98 (21) 8873 1515

Fax: +98 (21) 8873 2381

www.ghazvinglass.com
info@ghazvinglass.com

