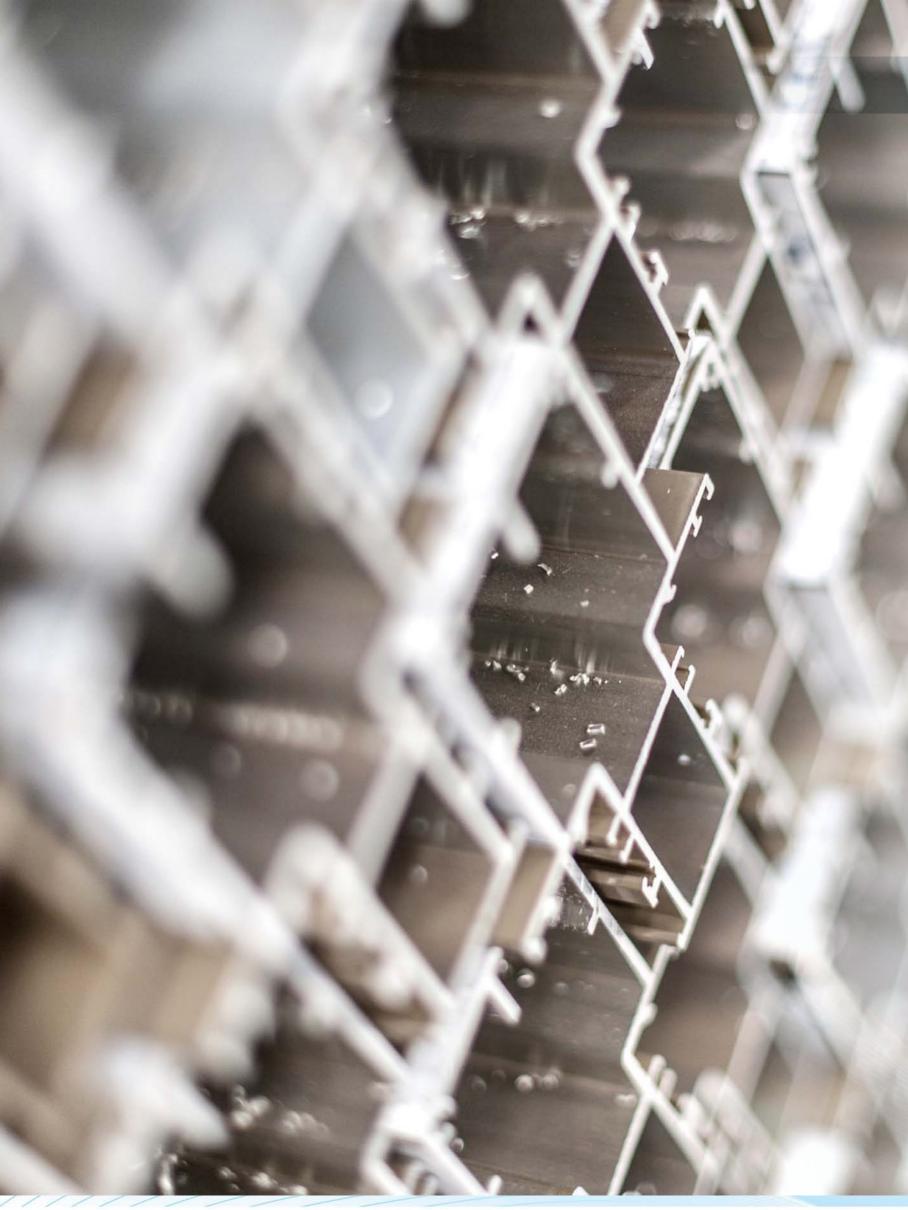


ALUMINUM



Architectural Building-Envelope Experts



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Our History

Wajhat Glass & Aluminium Factory was set up in Riyadh in 2009 in 42000m2 of custom-designed buildings on a "green-field" site and equipped with state-of-the-art glass & aluminium processing equipment of best European origin for the production of superior quality aluminium curtain wall, windows, doors, skylights, composite cladding panels and architectural flat glass products.

The prime objective of this impressive enterprise is to become a major, preferred source of high performance architectural aluminium and glass systems to meet the huge growth in demand from sophisticated construction projects throughout the Kingdom of Saudi Arabia and the entire Gulf region.

Wajhat Glass & Aluminium have succeeded in creating an Administrative, Technical and Production environment of the highest order with enormous design-flexibility to meet the most intricate requirements of every individual Client and Project.

In addition, Wajhat has the capacity to deal effectively and efficiently with the most challenging order volumes and construction schedulesand to ensure maximum customer satisfaction in terms of delivery, quality and performance.

"A business that makes nothing but money is a poor kind of business"

Henry Ford





Our Scope

Wajhat Glass & Aluminium is strongly focussed to a basic business principle: "Accurately matching the detailed needs of the Customer through utilisation of the best available human and technical resources". This is our fundamental motto, and we follow it by managing our business to employ all the synergies contained in the superb combination of our People, our Equipment and our Products.

We are proud to be able to participate at the highest standard of presentation at business-related exhibitions, both nationally and internationally.

We employ a workforce of around 600 employees on the factory-floor and around 50 qualified professional management and sales staff. Our collective experience is immense.

Our Quality Management System is based on ISO Standards * * * both for Factory and Administration procedures.

We have also established a Research & Development Department to be confirmed by WGA which will focus strongly on reviewing and developing current technology and operating techniques to enable the Company to meet, and exceed, the levels of satisfaction now demanded by our sophisticated Customer-base.

"Genius is one percent inspiration and ninety nine percent perspiration!"

Thomas Edison





Our Mission

To exceed customers' best expectations in cost, quality and delivery through continuous product and production improvement, through efficient and friendly customer interaction, by providing advanced technical solutions through expert custom design, manufacturing and installation all the way from initial concept design through to final handover on site.

To build on our expanding history of product excellence and technological innovation in the provision of materials for building envelopes, and to provide high quality, reliable and durable products and service to our valued customers.

To provide a work environment where our employees can further develope their expertise and reach their true potential in productivity and professionalism in the most efficient atmosphere where the key-word is "excellence"!

To achieve the highest levels of integrity and honesty in all our interactions with business partners and associates, to ensure timely delivery of products whose finish, appearance and performance are in totally accordance with our tradition in quality manufacture.

To sustain our vision and mission by constantly seeking renewal via continuous education and learning in the application of new technologies and best business practices.

To develope diversity in our markets thus ensuring stability with steady and growing financial returns to sustain future expansion of Wajhat for the benefit of our Owner, our Shareholders and our Employees.

"The best preparation for tomorrow is to do your best today!"

H. Jackson Brown



Company Introduction

Wajhat Glass & Aluminium Factory is one of the Region's leading specialists in the supply and installation of Building Envelopes, and is backed by the Al Harbi Holding Company, a long-established and distinguished Organization with extensive interests in many fields of Industry and Commerce, including Building Construction and Real Estate Investment. We are professionally organized to provide comprehensive solutions to the most detailed requirements of our Clients.

Our Company is structured as a vertically-integrated business which includes design, development, processing and installation of high quality building façade products which allows us to offer "turn-key" solutions to the most complex proposals submitted by our Clients. Our product-range encompasses Aluminium, Composite Cladding, Architectural Metal Work and Glass, each under the supervision of it's own Divisional Management dedicated to highest levels of inter-divisional co-operation and maximum customer care. No project is beyond our capacity and we can respond competitively and comprehensively to any technical challenge!

The Company employs skilled craftsmen at every level, and is capable of producing more than ????? custom-designed, unitised curtain wall panels daily to the highest international

quality standards. The high quality of our Human Resources is backed by the equally high quality of our Factory Equipment, thus ensuring that Wajhat's Product-Range and reputation shall consistently attain the highest levels of excellence.

In the Workplace, our Line Managers and Quality Control Supervisors constantly monitor every step of the production processes and our Installation Teams are on site to assemble every component into it's design location with precision and superb finish.

Our Team of expert Sales Engineers and Consultants from our four manufacturing divisions are always available to give the best advice at Design Stage on integrated product and project enhancement whilst ensuring that best value-engineering principles are not overlooked.

Wajhat's efficiency, competitive pricing and product quality are your guarantee for the total success of your project.

We all look forward to serving you!







Wajhat Glass & Aluminium Factory are specialised in the design, manufacture and installation of aluminium curtain walls, windows and doors for every type of building, including commercial, residential, educational medical and industrial premises.

Wajhat is equipped with a comprehensive range of processing equipment for all types of aluminium fabrication.

Wajhat's factories in Riyadh and Dubai are organized on the best principles of modern mass-production to ensure high levels of accuracy and output at optimum cost and with minimum environmental impact. All design-work is done within the Company's own professional resources, and all installation works are handled by our Contracts Department with it's own project management and labour on site. The synergy arising from this close integration of personnel and plant ensures Wajhat's ability to deliver complex orders according to schedule and specification determined and agreed with Client.

Curtain walling techniques have been used to clad the structural skeletons of high-rise buildings for more than 80 years. Prior to the advent of mass-produced extruded aluminium in the 1950's, steel was the most commonly used material to support the glazing and opaque cladding. Today, the development of aluminium curtainwall systems has reached exceptionally high levels of tolerance, durability and performance as demonstrated by Wajhat's Technical Partners, Messrs Schuco and Gutmann. We, at Wajhat, are totally committed to the philosophy that curtainwalling is still the most cost-effective and practical way to clad the exterior of a building structure, and to maximise the useable floor-space for the benefit of the Developer.

Curtainwalling is a system for creating a grid comprising thousands of extruded aluminium profiles whose joints are formed mechanically, that-is-to-say they are not welded. This system of mechanical connections allows the grid to absorb all kinds of differential movement over the life of the building including building-settlement, thermal expansion and contraction (severe throughout most of the Middle East), wind loads and seismic effects. Nevertheless, the main purpose of the curtainwall is to protect the interior of the building from air and water penetration, to maintain a stable indoor comfort-level in all Seasons, and, last but not least, to bring daylight into the building and provide a view beyond the pane for all of it's occupants.

How is this done?

In any mechanically-joined metal grid, such as a curtain wall, it is impossible to ensure that air and water do not penetrate the assembly due to large pressure-differences between the interior and exterior of the wall. This problem is elegantly







Introduction to Aluminum Division

solved by means of pressure-equalised drained joints which allow air and water to partially penetrate the system where the energy is neutralised and incoming water flows down the inside of the mullion and can escape at ambient pressure to the outside. Thus the room side of the wall is air and water-tight with no penetration. Each curtainwall member is designed to interlock with it's adjacent components to create as grid of enormous strength when attached to the underlying building-structure, while allowing independent movement due to higher coefficients of expansion of glass and aluminium.

Wajhat recognizes that, in spite of every reasonable effort to prepare the joints in the façade, it is likely that water will penetrate at some location. This may be due to loss of adhesion in the sealants, or through gaskets which have become partially dislodged, possibly during installation, or subsequently. Since there will be many lineal meters of joints in a curtain wall grid, Wajhat curtain walls are designed on the "Rain Screen" principle, as described above, which allows for some random penetration through the external seals. Small openings, formed as notches or slots, are provided in the joint-cavities to allow incoming water to drain horizontally left and right to be carried down through the mullions and ultimately to the exterior via weep-holes. Thus, the interior seals are not compromised, and the rain-screen is able to perform it's function which is to protect the indoor environment.

These principles acknowledge the need to provide a building envelope which is wind-proof and water-proof, but remains light and elegant, thereby enhancing the aesthetic appearance of the building. Frequently, when we look at many typical modern structures, we see only the curtain wall.

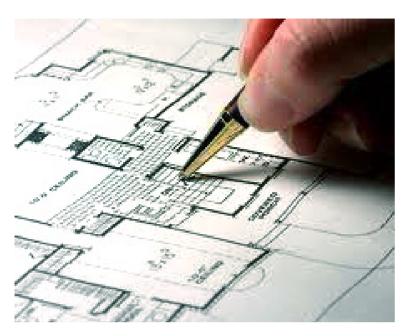
As expected, the success of the system depends on accuracy of fabrication and installation which again depends on the high level of professional attention to detail at Wajhat Aluminium. Cutting and machining of extrusions are prepared using CAD/CAM software which integrated with the factory equipment and directly programmed to carry out all the cutting and machining operations. On loading of any particular extrusion to the production line, the operation is substantially automated through to completion of the manufacturing sequence. Sophisticated optimisation programmes ensure that waste is minimised and that handling is done in the most efficient manner from material requisition from Supplier or Store through to finished product.

Material traceability ensures compliance to best QA/QC procedures in compliance with current ISO 9001.2000 standards.

Wajhat Aluminium employs a professional and highy equipped IT Department to oversee it's entire organisational and technical processes.







Design Office

Complete custom-made software for computer-assisted drafting and design for:

- Curtain wall and window systems
- Frameless glass walls
- Structural steel
- Composite cladding
- Skylights and roofing
- Water proofing
- Mock-up drawings
- Production drawings
- Installation drawings

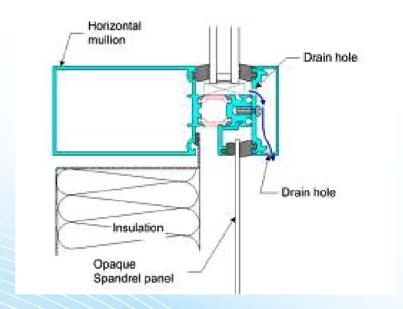


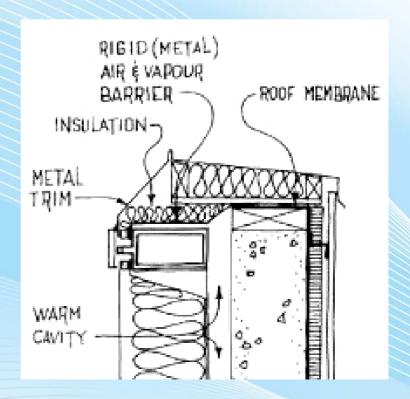


Structural Engineering

- Complete structural analysis and design including windload calculations
- Evaluation and testing of materials
- Evaluation of structural integrity of proposed design solutions
- Buckling and stability analysis for façade designs
- Finite element analysis
- Large deflection and membrane stress analysis
- Thermal stress analysis
- Thermal transmission analysis of glazed aluminium facades









New Systems Design and Development

- Purpose-made and standard curtain walls
- Unitized curtain wall
- Panelized curtain wall
- Stick System Curtain Wall
- Bolted frameless glass facades with glass fins, stain less steel spider connections, patch-fittings etc
- Structural silicone glazing
- Window designs
- Sliding glass and/or aluminium doors.
- Sloped glazing in atriums and skylights
- Cladding in composite aluminium and other materials

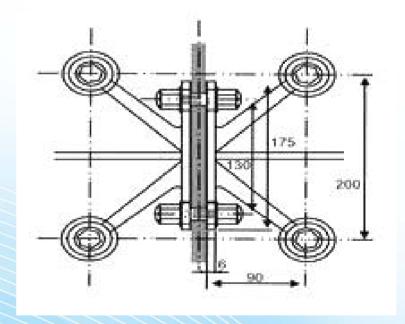


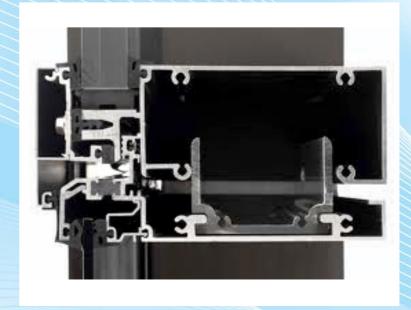


Research and Development

- Structural silicone testing
- Expansion joints
- Adhesive anchors
- Mechanical anchors and "Halfen" rails
- Gasket designs
- Blast resistance
- Hurricane resistance
- Development of QA/QC procedures









Design Services

As early as Concept Design stage, Wajhat Design Engineers in Riyadh and Dubai work in close collaboration with the Sales & Marketing Teams to assist the Project Architects in developing practical solutions for the design and execution of elegant and efficient façade—works. We are also able to call upon the huge technical resources available from our Technical Partners, Messrs Schuco & Gutmann, and use this synergy effectively to build confidence between us and our Clients. We are thus able to demonstrate the highest levels of interaction, based on solid design and engineering principles, from our in-house resources.

Furthermore, We can provide detailed value-engineering experience to ensure that all of our technical solutions are not over-designed and are kept within the project budget, but without compromise to safety and long-term performance. We can perform this impressive advisory service across our entire Product-Range and have already established a strong and growing reputation for competence amongst the Architectural and Engineering professions.







Sustainability in Design and Production



Wajhat is also fully committed to the principles of sustainability in all of our corporate activities, and we thoroughly implement the principles of "Green Building", very much in accordance with current LEED and ESTIDAMA guidelines for sustainable building design. Our clear objective is to exercise due caution at every stage of our processing, administration, manufacturing & installation in order to control the impact of our "Company Energy Footprint" (direct energy-use as well as embedded energy-use) on the environment.

These fundamental principles of good sustainable design are built in to our Quality Policy to ensure that product quality and performance from all our production facilities is at least equal to the very best in the current market.





Facade Engineering Services

The modern Built Environment, as we know it, is a key-element in our contemporary civilization and is achieved substantiallybythequalityoftheBuildingEnvelopesthatwedeviseto protect ourselves from short-term changes in the weather and long-term changes in climate. Building envelopes formed from aluminium curtainwalling must perform a number of critical tasks without fail, namely:

- To filter light and provide daylight
- To moderate heat or cold
- To block infiltration of air and water
- To provide optimum indoor comfort at affordable cost

Wajhat provides the following services to achieve these goals:

- Research and design development
- Engineering and Value Engineering
- Performance testing
- Thermal analysis
- Code and Standards Compliance

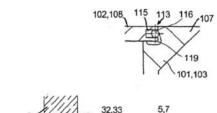
Our mission is to devise practicable and buildable solutions using the full capacity of our resources in state-of-the-art equipment and the of our design and production teams.

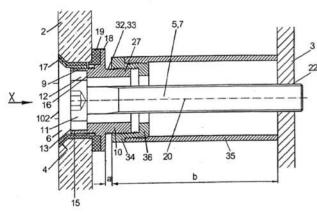














Structural design is an engineering process to determine all the "Fail-Safe" aspects of a structure exposed to the most severe dynamic forces of Nature.

All buildings are subject to movement, and the Façade Engineer must be able to predict and confirm the effects of complex building movement in relation to the equally complex movement of his materials which different coefficients of linear expansion and contraction.

Façade engineering is a specialized link between Civil Engineering and Architecture and we, at Wajhat Glass & Aluminium, bring this expertise to our Industry as specialists at this critical interface.

The structural design of façade-works involves:

- Wind-Load resistance calculations according to American Standard ASTM E 1300
- Glass strength and deflection calculations
- Fixing methods and materials
- Sealant specification, testing and gasket design
- Ease and efficiency of installation
- Method statements

In addition to the above, the structural design team must assess the overall performance of the façade with regard to it's thermal efficiency in keeping air-conditioned buildings cool and heated buildings warm at optimum energy-cost.

Wajhat Aluminium has the facilities to undertake thermal modelling studies to ensure that their metal-works have the lowest-possible thermal conductivity and best possible air-tightness in the most extreme conditions of heat or cold: our prime objective is to ensure a building envelope and services which facilitate the efficient use of energy appropriate to their function and use, internal environment and geographical location.

We also call on our impressive expertise in Glass Division, Arc Glass, to produce high performance glazing products to meet the requirements of the project specification for heat and light control. In particular, our design team has to ensure that the specification given to Arc Glass for manufacture, complies with project requirements for solar control [SHGC: Solar Heat Gain Coefficient] and Thermal insulation [U-value] in accordance with Mechanical Engineer's calculations for optimum operation of air-conditioning and/or heating equipment.

Finally, our Structural Design Team must be aware of all current Green Building Rating Systems and Municipal Green Codes now in force throughout the Gulf Region, and together with our sales and marketing teams, be able to offer Wajhat Aluminium and Arc Glass products which are fully compliant with binding Government requirements.



System Design

"Stick-System " Curtain Wall

The "Stick System" is also often known as "conventional curtainwall" and has been in continuous use as a means for cladding concrete or structural steel skeletons for over 60 years. Essentially, the "stick system" is constructed entirely on site using anodized or powder-coated aluminium profiles to create a grid of mullions and transoms which are all mechanically connected. The aluminium grid is attached to the structure by means of accurately-placed galvanized steel brackets and stainless steel bolts and screws are used in order to prevent anodic reaction between steel and aluminium. Expansion and contraction are accommodated by means of sliding joints in the mullions.

Glass is secured by means of mill-finish aluminium pressure-plates with integral gaskets known as "captured glazing", and a wide variety of snap-on cover plates is available to create a pleasing aesthetic appearance. With this system, the perimeter sealants of Insulated Glass Units is totally concealed. Provision of "rain-screen" principles ensures efficient control of air and water infiltration by means of internal drainage to weep-holes in the mullions.

The "stick system" is relatively simple and competitive, although these advantages are becoming steadily overtaken by rising labour costs and slower pace of construction which is also affected by adverse weather conditions. All glass has to be installed on site and extreme care must be exercised to ensure that all joints are perfectly sealed with appropriate materials. In addition, the application of "stick system" curtainwalling requires the use of scaffolding which tends to limit the potential building height. The "stick system" is not a suitable option for any project on a "fast track" construction schedule, or where regular adverse weather conditions are likely to delay progress.

The Gutmann F50/F60 Optical Structural system is an excellent example of stick system curtainwall technology in which the glass is mechanically secured by means of an anodized or powder coated flush-glazed pressure plate to give the appearance of a structural silicone curtainwall with concealed glass edges.

Overall, the stick system of conventional curtainwalling still has a useful position in contemporary architectural design, especially for low-rise buildings, and is a mature engineering concept for reliable and cost-effective building envelope design.



4-Side Structural Silicone Curtainwall

Contemporary architecture increasingly calls for flush-glazing and the elimination of visible external support. To achieve this aesthetic appearance, the stick system can be adapted for the use of sealed insulated glass units having aluminium "U" inserts embedded in the perimeter structural silicone in such a way that they can be attached to the mullion/grid by means of rotatable clips, thus providing a partial mechanical fix: the security and integrity of the Outer Pane of the IG Unit relies on the structural silicone bond between the two panes. The joints between adjacent panels is finished off with structural silicone, applied on site, to give a smooth weathering seal and a smooth flush finish to the façade.

The Gutmann F50/F60 Structural System is an elegant and efficient example of this principle.

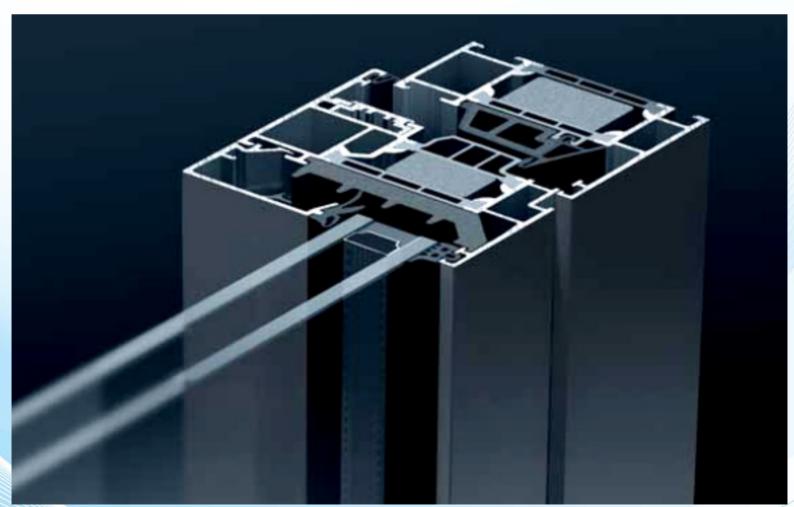






2 - Side Structural Curtainwall

This is a popular curtainwall solution which employs pressure-plates for the transom joints (see Gutmann F50/F60 Optical Structural System) and structural silicone for the mullions, thus providing flush glazing with the advantage of mechanical support for retention of the glazing.



Unitized (On-Line) Curtainwall

As demonstrated by the highest towers (already built or still in design-and-constuction stage), glass and aluminium will continue well into the future as the dominant materials of choice for their combination of light weight, strength, durability and perfect control of the indoor environment in all climatic conditions.

The demand for taller buildings, faster construction schedules plus rising labour costs have lead to the evolution of "Unitized" ("panellized") cladding systems which are substantially built off-site under factory-conditions. Unitization is the logical solution to highest productivity in manufacture and installation for all fast-track projects, all at the highest quality standards and least-of-all affected by adverse weather conditions.

On site, unitized panels are attached by CW Specialist Installation Teams, working at edge-of-slab in conjunction with skilled crane operators.

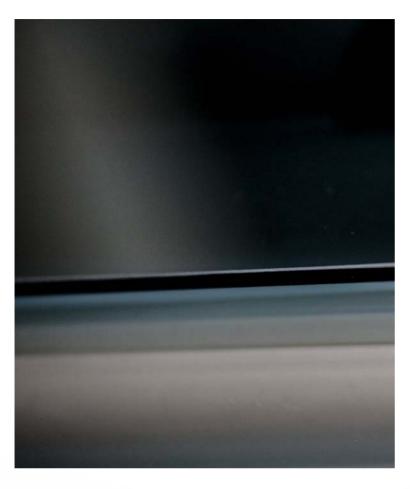
All seals and gaskets are pre-installed and the connection of one panel to another provides pressure-equalized self-draining properties to ensure air and water-tightness.

Smoke and fire-stop materials are applied between at slablevel to ensure total compliance with best international standards and local Civil Defense Codes.

The system can accommodate openable windows and spandrel panels in a variety of materials, including Gutbond composite aluminium panels with insulated back-pans.







Glass

Arc Glass, the glass-manufacturing Division of Wajhat Glass & Aluminium Factory, have tha capability to supply a comprehensive range of high quality, high performance safety and insulated glass to meet each and every specific requirement from Wajhat Aluminium.



Aluminium Doors & Windows

Wajhat Aluminium Factory has a comprehensive range of hinged, pivoted and sliding windows, mostly with thermal break performance, for virtually every type of building. A range of openable windows is also available for use with all of Wajhat's unitized and structural curtainwall systems based on Gutmann and Schuco technology.

A broad range of hinged and sliding doors is also available, and which can be supplied with state-of-the-art manual or automatic control systems.

The use of robust hardware and accessories ensures serviceability and reliability to perform efficiently in the most challenging environments.

Door and window glass are sourced from Arc Glass, Wajhat's in-house Glass Processing Division.

Sustainable Facade Design

It is an alarming fact the Gulf States produce the World's highest per capita Greenhouse Gas Emissions and carbon footprints.

In spite of abundant resources of solar power, the bulk of electricity generation throughout the Region continues to depend on the burning of gas and oil, and this situation will continue for some time until the cost of conventional power-generation rises to a level at which solar power can be cost-effective. Our cooling-dominated environment, ultra-lowrainfall and minimal cloud-cover create an extremely high demand for air-conditioning and water. Over 70% of power generated within the Gulf region is for cooling. Looking ahead, Nuclear Power, now under construction in the UAE, will not be cheap: electricity tariffs will certainly rise substantially, and so there is now an increasing need to comply with Green Building Guidelines for sustainable architectural design.

Wajhat Aluminium recognizes that the construction of modern glazed facades must fully acknowledge the physical limitations of aluminium and glass in terms of thermal efficiency and to ensure that all materials used are selected and specified to the highest standards.

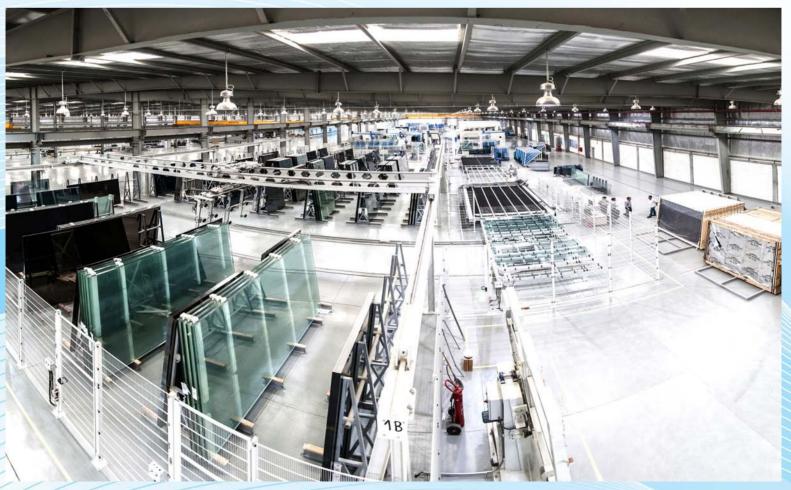
In recognition of this urgent need to raise the standard of building design in our Region, many Developers and Government organizations are now turning to the principles of the LEED Green Building Rating System. LEED (Leadership in Energy and Environment Design) is an optional guide to sustainable design and involves a certification process at various levels of compliance which are:

- · Certified only
- Silver grade
- Gold grade
- Platinum Grade

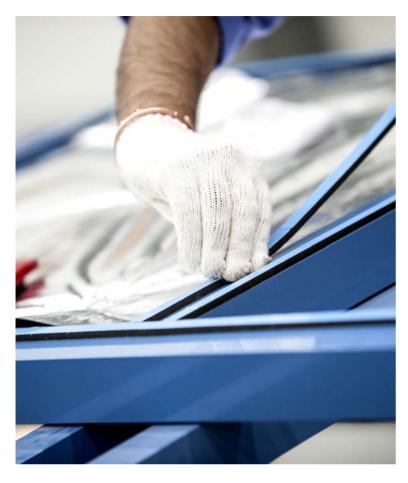
Recently, the Government of Abu Dhabi has established the "Estidama" Green Building Rating System which has been created with special attention to local Gulf environmental conditions

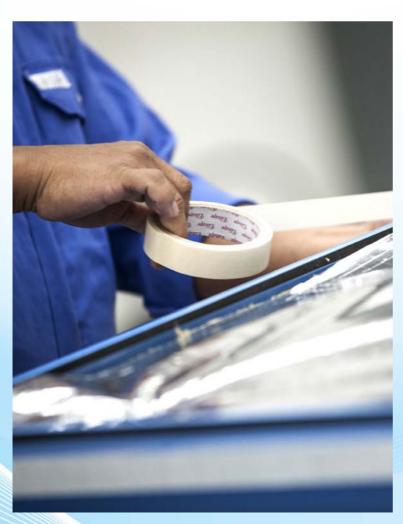
Estidama is a guide to sustainable design in hot desert conditions and, like LEED, is a certifiable process for rating of sustainable design with "Pearl" awards:

- One Pearl (Least stringent)
- Two Pearls
- Three Pearls
- Four Pearls
- Five Pearls (most stringent)



Sustainable Facade Design





The Government of Abu Dhabi has ordered that all new Government buildings must attain at least two Pearls.

Both LEED and Estidama are strongly supported by the current ASHRAE 90.1 Standard.

LEED and Estidama place a high degree of importance on three critical aspects relating to the design of the building envelope, namely:

- Energy and atmosphere
- Daylight and views including indoor air-quality
- Regional sourcing and recycling of materials

Together, these three categories can potentially account for over 45% of the points required to achieve a LEED "Platinum" or an ESTIDAMA " 5-Pearl" sustainable design rating.

Wajhat Glass & Aluminium have every facility required to enable Clients to earn valuable points in both Rating Systems by providing:

- Thermally efficient designs
- Locally-produced extrusions and gaskets
- In-House anodizing and powder coating
- Locally produced float glass
- Locally produced solar reflective and Low-E glass
- In-house glass-processing
- Recycling of metal waste

Wajhat Sales and Design Engineers are well-qualified to work with architects and LEED and ESTIDAMA profession al AP's (Accredited Professionals) to assist in the achievement of competent sustainable facades. This is of vital importance in making a significant contribution to lowering of the Gulf's swollen regional carbon footprint.





CERTIFICATE

The Certification Body of TÜV SÜD Management Service GmbH

certifies that

Petra Gulf Co. L.L.C P.O. Box: 73676 **Dubai, United Arab Emirates**

has established and applies a Quality Management System for

Design, Fabrication and Installation of Framed Architectural Aluminium Products including Windows, Doors, Curtain walls, Skylights and related façade solutions.

> An audit was performed, Report No. 70758783 Proof has been furnished that the requirements according to

> > ISO 9001:2008

are fulfilled. The certificate is valid until 2012-11-07 Certificate Registration No. 12 100 37671 TMS





QMS-TGA-ZM-07-92

TÜV SÜD Management Service GmbH • Zertifizierstelle • Ridlerstraße 65 • 80339 München • Germany

TUV®

Aluminum Photo Gallery

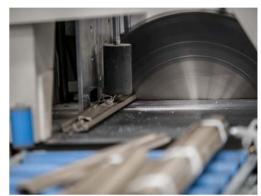




















Aluminum Photo Gallery





















Aluminum Photo Gallery























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